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ABSTRACT HANDBOOK

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Leukemia and Lymphoma

0001: Influence of methylenetetrahydrofolate reductase C677T polymorphism on high-dose methotrexate toxicity in pediatric mature B-cell lymphoma patients

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Keywords: lymphoma, methotrexate, genetic polymorphism

Objective: To investigate the effect of genetic polymorphisms of MTHFR C677T (rs1801133) on methotrexate (MTX) related toxicity in pediatric mature B-cell lymphoma patients.

Methods: Clinical data of 58 patients under 18 years old with mature B-cell lymphoma who received 5g/m2 MTX (24h intravenous infusion) in Sun Yat-sen University Cancer Center between August 2014 and December 2021 were collected. Only patients at intermediate and high risk were included in the study. We monitor the toxicity of high-dose methotrexate (HD-MTX) in children with mature B-cell lymphoma.

Results: Among 58 children with mature B-cell lymphoma, the number of CC, CT, and TT genotypes for MTHFR C677T was 33 (56.9%),19 (32.8%), and 6 (10.3%), respectively. Overall, 101 courses of HD-MTX therapy were prescribed. We found that plasma MTX levels > 0.2 μmol/L at 48h post-MTX infusion increased the risk of developing oral mucositis (4.5% vs 20%, P=0.030) by comparing between groups. Compared with the wild group (CC genotype), patients in the mutant group (CT+TT genotype) were more likely to develop myelosuppression, including anemia (54.0% vs 74.5%, P=0.031), leukopenia (54.0% vs 80.4%, P=0.005), neutropenia (46.0% vs 72.5%, P=0.007) and thrombocytopenia (46.0% vs 80.4%, P=0.0003). However, plasma MTX level at 48h was not associated with MTHFR C677T gene polymorphism (43.9% vs 62.9%, P=0.070).

Conclusions: Plasma MTX levels > 0.2 µmol/L at 48h post-MTX infusion increased the risk of developing oral mucositis. Also, patients in the mutant group (CT+TT genotype) were more susceptible to myelosuppression, while plasma MTX level at 48h is not correlated with genetic polymorphisms of MTHFR C677T.

Leukemia and Lymphoma

0003: Induction deaths in acute lymphoblastic leukemia: analysis from a low middle income country

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Keywords: leukemia, low-middle income countries, mortality

Objective: Induction is the most crucial phase in acute lymphoblastic leukemia with a risk for mortality. Treatment related mortality is higher in low middle income countries (LMIC's), a major impediment to overall survival. We aimed to analyze the cause of deaths during induction therapy at our center.

Methods: Retrospective analysis of induction deaths from 2018 to 2022 (5 years) was done from case records. Therapy was as per the Indian Childhood Collaborative Leukemia Group (ICiCLe) protocol using prophase steroids for 7 days followed by induction chemotherapy as per risk allocation.

Results: Seven hundred and fifty seven patients were initiated on therapy. There were 47 deaths

(6.2%) in the induction phase, which are analyzed. Mean age – 5.9 years, males – 25 and females - 22. Forty (85%) were B ALL [standard risk (SR) –9, intermediate risk (IR) – 15 and high risk (HR) – 16], 3 (6.5%) T ALL and 4(8.5%) biphenotypic acute leukemia. Mortality: There were 14 early deaths (15 days) and 19 late deaths (>15 days). Seventy four percent deaths were attributable to infections – bacterial (53% [gram negative -12, gram positive -3, polymicrobial-5]); fungal (11%) and unspecified (10%). The other causes of death included: major bleed in 9%, tumor lysis syndrome -2%. Two children had a CNS event. The cause of death could not be ascertained in 4 patients. Among these patients, 49% were undernourished, 26% had hyperleukocytosis, 20% had bulky disease. Deaths were not higher in high-risk patients/those with high counts.

Conclusions: Prophase steroids result in gentle reduction of disease and give time to stabilize patients before chemotherapy. We report 6% induction deaths with three-fourth being attributable to sepsis. Superior infection control and prevention practices are the way forward in combating sepsis, a modifiable problem in LMICs to improve overall survival.

Leukemia and Lymphoma

0004: Long non-coding RNA signatures and their role in the progression of childhood T-cell acute lymphoblastic leukemia

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Keywords: T-cell lymphoma, biomarkers, RNA

Objective: Many disease processes are thought to be impacted by altered long non-coding RNAs (lncRNAs) expression. lncRNAs are typically expressed differently throughout healthy and cancerous hematopoiesis. In the domains of hematology and oncology, they represent a class of biomarkers that is receiving increasing attention. According to recent studies, the expression levels of particular lncRNAs are correlated with the prognosis of pediatric patients with acute lymphoblastic leukemia. To determine the potential roles of lncRNAs involved in the pathogenesis of T-ALL, we analyzed the expression profile of lncRNAs in pediatric T-ALL

Methods: Twenty-five pediatric T-All patients were enrolled and subjected to whole transcriptome analysis in comparison with healthy controls. The results from NGS were validated ex vivo, using real-time PCR in a different cohort of 25 T-ALL and 20 healthy childhood cases, and in silico using public databases. Potential functions of subtype-specific lncRNAs were determined by using co expression-based analysis on distally (trans-pattern) located protein-coding genes.

Results: A total of 1813 differentially expressed lncRNAs were identified. Moreover, the top 10 upregulated lncRNAs were selected and further assessed by RT-qPCR in vitro. In addition, the co-expression analysis demonstrated that these lncRNAs, including LINC01221, LINC00977, CTD-2291D10.4, and RP11-472G21.2 mediate the pathogenesis and development of T-ALL via lncRNA-

mRNA network interactions. We also analyzed the expression of five lncRNAs in Jurkat and HH cells. The high expression of these lncRNAs was related to poor OS survival of T-ALL patients. **Conclusions:** These results showed that several lncRNAs are aberrantly expressed in T-ALL patients and play potential roles in T-ALL development and can be useful for diagnostic and/or prognostic purposes in pediatric T-ALL. This study provides the keystone to future clinical studies determining the theragnostic value of the characterized long non-coding transcriptome panorama in a clinical setting for childhood patient management.

Leukemia and Lymphoma

0005: Successful implementation of a modified St Jude total XV protocol for treating children with acute lymphoblastic leukemia in Lebanon. Lessons for low- and middle-income countries

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Keywords: acute lymphoblastic leukemia, sepsis, implementation

Objective: At the Children's Cancer Center of Lebanon (CCCL), we had used the St. Jude Total XV regimen for treating pediatric acute lymphoblastic leukemia in the period between 2002-2009 and noticed notable increases in survival rates. Nevertheless, patients also reported infection-related mortality, severe infections that necessitated hospitalization to an intensive care unit, CNS toxicities, CMV retinitis, and a decreased quality of life in remission. In order to address these problems, we modified the St Jude Total XV protocol in January 2016 by stopping vincristine and dexamethasone pulses at week 69 of maintenance, lowering the VCR dose to 1.5 mg/m2 (maximum 2 mg) and omitting doxorubicin from re-induction II for low risk patients.

Methods: 127 consecutive newly diagnosed ALL patients aged 1 to 18 years between January 2016-January 2022 were enrolled in a modified CCCL protocol which was based on modified St. Jude Total XV protocol. The American University of Beirut Medical Center's Institutional Review Board (AUBMC) gave its approval to the treatment plan, and the patients' parents or legal guardians signed informed consent forms.

Results: There were no sepsis-related fatalities during remission, no cases of CMV retinitis, and no life-threatening infections. Only one patient required critical care admission. 14 patients relapsed. Ten were on the Int/High Risk arm, whereas four were on the low-risk arm. Seven out of 14 died. Two after developing secondary AML. The Kaplan Meir estimate of the 5-year overall survival was 88.5% (95% CI 77-94) in the pre-amendment period against 92% (95% CI 83-96) in the post-amendment period. In addition, the pre-amendment period's 5-year event-free survival kaplan meier estimate was 78.7% (95% CI 69-88) as opposed to 86% (95% CI 77-92) in the post-amendment period.

Conclusions: The amendments applied to total XV protocol helped reduce the rate of death during remission from 3.6% to 0%, eliminate CMV retinitis from 3.6% to 0%, and reduce the number of critical care admissions without leading to an inferior outcome in middle to low income countries. This could potentially reduce the burden on healthcare systems, improve quality of life for those affected by childhood acute lymphoblastic leukemia, and reduce costs associated with long term maintenance therapy.

Leukemia and Lymphoma

0006: Spectrum of AML/MDS predisposing gene mutations in pediatric and young adult marrow failure cases

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Keywords: MDS, AML, predisposition

Objective: In addition to classical inherited bone marrow failure syndromes (IBMFS), germline variations in genes related with hematopoietic cell development, repair and immunity also predispose to the development of MDS/AML. Aim: To highlight spectrum of AML/MDS predisposing gene mutations in pediatric and young adult marrow failure cases.

Methods: Bone marrow failure cases (suspected IBMFS or idiopathic aplastic anemia-IAA) were evaluated by targeted next generation sequencing (NGS) panel of 33 genes related with marrow failure and MDS/AML predisposition genes of ETV6, RUNX1, ANKRD26, SRP72, DDX41, SAMD9, SAMD9L, MECOM, ERCC6L2, DNACJ21 and GATA-2 over 4 years (2018-2022).

Results: Out of 171 marrow failure (IBMFS-106, IAA-65) cases evaluated by NGS, 13 (7.6%) revealed germline mutations in 5/11 genes in the panel. Amongst the 13 cases, 10 belonged to clinically suspected IBMFS group (SAMD9-5; MECOM & SRP72-2 each; GATA-2- 1), while 3 belonged to the IAA group (SAMD9-2, MECOM-1). However, only 5/13 (38.5%) had MDS/AML development (SAMD9-2, MECOM, SRP72 & GATA-2 one each). Both SAMD9 cases that developed MDS had monosomy 7 on FISH. Additionally, one of the 3 remaining cases with SAMD9 mutations developed Hodgkin lymphoma as secondary cancer. Overall, out of total of 19/171 (11%) cases with MDS/AML presentation in a marrow failure background, 5 (26%) had germline predisposition gene mutations highlighted above, 3 (16%) had an underlying classical IBMFS.

gene mutation (DKC1- 2 cases and CSF3R-1 case) while 11 (58%) did not reveal any mutation in our panel genes.

Conclusions: Overall frequency of pathogenic germline variations in MDS/AML predisposing genes were 9.4% (10/106) in the suspected IBMFS group and 4.6% (3/65) in the IAA group. This analysis highlights mutations in newer IBMFS genes like SAMD9/MECOM to be common in marrow failure patients and emphasizes the need for these genes to be incorporated in targeted NGS panels with appropriate longitudinal follow up of the patients.

Leukemia and Lymphoma

0007: Clonal heterogeneity in children with juvenile myelomonocytic leukemia (JMML) by single-cell DNA-sequencing

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Keywords: acute myeloid leukemia, molecular aberrations, DNA-sequencing

Objective: To investigate the clonal heterogeneity of bone marrow in Juvenile Myelomonocytic Leukemia (JMML) patients, determine secondary molecular events contributing to transformation into secondary acute myeloid leukemia (sAML).

Methods: We obtained bone marrow aspirate (BM) samples from six children (5 male and 1 female, the median age – 1,5 years (1-3 years)) diagnosed with JMML. Single-cell amplicon-based DNA sequencing (scDNA) with Tapestri platform (MissionBio) and a custom. Tapestri Myeloid Panel targeting 45 genes was performed at the moment of sAML transformation for 4 patients and

for 2 patients - at the initial diagnosis.

Results: In two patients with sAML and PTPN11 mutations, we discovered a pathogenic SETBP1 p.D868N variant not present at the initial diagnosis. Two clones with heterozygous NRAS p.G13D mutation and homozygous NRAS p.G13D mutation were found in the third patient with sAML. One of the patients without sAML initially had a heterozygous NF1 (c.6988delT) mutation. scDNA of BM samples demonstrated two tumor clones with PTPN11 p.D61V mutation in 74% and KRAS p.G12S mutation in 1% of cells. Two patients did not have any secondary genetic events. Cells without pathogenic mutations were found in all six analyzed patients, indicating the possible presence of residual normal hematopoiesis in JMML patients (% of wild type clones varied from 1,29% to 10%).

Conclusions: In our work, we were able to dissect the clonal heterogeneity of JMML and identify secondary genetic events that may be responsible for transformation into sAML. We observed two distinctive cell lines in two patients with initial PTPN11 mutations: the first cell line presented with PTPN11 mutation only, whereas the second predominant line presented with an additional SETBP1 mutation. These findings allowed us to conclude that SETBP1 mutation was the second event leading to AML transformation. Moreover, we found evidence of a simultaneous presence of two hematopoietic lines in all examined JMML patients.

Leukemia and Lymphoma

0008: Natural killer cell therapy in childhood acute myeloid leukemia

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Keywords: natural killer cells, innate immunity, GVHD

Objective: To date, chemotherapy's possibilities for treating acute myeloid leukemia (AML) in children are practically exhausted and limited by high toxicity. As an alternative, immunotherapy is considered using natural killer (NK) cells, a tool of innate immunity with biological antitumor activity.

Methods: Eighteen patients with AML of different risk groups, including those with refractory forms, received NK cell immunotherapy at the Center for Pediatric Oncology, Hematology, and Immunology in 2014-2022. In all cases, NK cells were isolated from a haploidentical related donor since 2014 by immunomagnetic selection (group 1) and since 2019 by expansion on genetically modified feeder lines (group 2), which makes it possible to enlarge content of NK cells and purity of cell culture product. Patients received NK cell immunotherapy as consolidating therapy (Cy/FLU + NK) or to enhance standard chemotherapy. All patients of group 1 (N=8) received one injection of NK cells, the average dose was 16.5x106/kg, the average purity of the cell culture was 81.5%. Group 2 (N=10) patients received one to three injections of NK cells, the average dose was 52.2x106/kg, the average cell culture purity was 94.4%.

Results: No severe adverse reactions or GVHD events were recorded in any of the cases. Less toxicity than standard chemotherapy and an excellent antileukemic effect of immunotherapy was also shown: for 90% of patients, a significant decrease in the level of minimal residual disease was detected. To date, among fourteen patients with de-novo AML eleven are alive and in remission. Among four patients with refractory forms of AML, three achieved remission with immunotherapy, making it possible to perform successful hematopoietic stem cell transplantation in two of them.

Conclusions: Eight years of experience with NK cell immunotherapy suggests that this option is safe, well tolerated by patients, and an effective adjunct to standard AML chemotherapy.

Leukemia and Lymphoma

0009: Real-time PCR combined with multinomial logistic regression to detect BCR: ABL1-like acute lymphoblastic leukemia

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Keywords: BCR::ABL1-like leukemia, 15-gene expression, genetic abnormalities

Objective: BCR::ABL1-like acute lymphoblastic leukemia (ALL) is characterized by a wide range of genetic abnormalities with a particularly poor prognosis which makes laboratory diagnosis of this molecular subtype difficult. The diagnosis of BCR::ABL1-like ALL is reduced to multiple evaluation of gene expression using various methods, and detection of rearrangements involving the genes of

tyrosine kinases, cytokines and receptors using cytogenetic methods. Most often, a combination of these two approaches is used. The aim was to identify the molecular subtype of BCR::ABL1-like ALL using a 15-gene expression data set.

Methods: The study included 123 pediatric patients with primary B-cell ALL. Patients were randomized into two groups: the control group included 15 patients with BCR::ABL1 translocation; 108 patients formed the study group of B-other ALL – cases of ALL without significant aberrations, such as aneuploidy, rearrangements involving the KMT2A gene, ABL1, ETV6::RUNX1, TCF3::PBX1, and iAMP21.

Results: In order to identify the BCR::ABL1-like ALL, a system for analyzing the expression of 15 genes (NRXN3, BMPR1B, GPR110, CHN2, SPATS2L, PON2, SLC2A5, SEMA6A, TP53INP1, IGJ, CRLF2, S100Z, CA6, MUC4, IFITM1) was developed using the real time PCR. The relative expression of genes in 5 multiplex reactions assessed by the deltaCt method. The mathematical model of multinomial logistic regression was applied to the obtained data, which determined the probability of belonging of patients from the study group (B-other ALL) to the control group (BCR::ABL1+ ALL). As a result, molecular subtype BCR::ABL1-like ALL was identified in 7 (6.5%) patients of the study group.

Conclusions: Using of 15-gene expression data set in combination with multinomial logistic regression could be used to detect BCR::ABL1-like ALL.

Leukemia and Lymphoma

0010: Prevalence of T-cell malignancies in patients with chromosome instability syndromes

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Keywords: T-cell lymphoma, chromosome instability syndrome, prevalence

Objective: Chromosome instability syndromes (CIS) are a group of rare inherited disorders associated with chromosomal instability and breakage, either spontaneously or in response to DNA damaging agents. CIS include Ataxia telangiectasia (A-T), Nijmegen breakage syndrome (NBS) and Bloom syndrome (BS), etc.

Methods: We report the incidence of malignancy among 46 patients with chromosome instability syndromes, diagnosed from 1990 until 2022 in Belarus.

Results: Fourteen out of forty-six (30.4%) patients developed a malignancy in the age of 1-21 years with a median of 8 years. Underlying diagnosis in 14 affected patients was NBS (n=9), A-T (n=4), BS (n=1). Six out of nine patients with NBS developed T-cell malignancy: 2 – T-cell lymphoblastic lymphoma (T-LBL), 2 – T-cell acute lymphoblastic leukemia (T-ALL), 1 – peripheral T-cell lymphoma (PTCL), 1 – anaplastic large cell lymphoma (ALCL). Three out of nine patients with NBS were diagnosed with diffuse large B-cell lymphoma (DLBCL), mixed-phenotype acute leukemia (MPAL), acute undifferentiated leukemia (AUL). Two out of four patients with A-T developed T-ALL. The other 2 patients with A-T were diagnosed with non-determined subtype of

lymphoma and optic nerve glioma. A patient with BS was diagnosed with ALCL. Five patients are alive (38%), 3 of them underwent allogeneic hematopoietic Stem Cell Transplantation (HSCT). One patient with A-T lost to follow-up. Malignancy was the main cause of death (6 – NBS, 1 – A-T, 1 – BS).

Conclusions: Our results show that 30.4% of patients with CIS developed a malignancy. 93% of patients had oncohematological diseases, among which NHL dominated - 54%, leukemia accounted for 46%. In the described group of malignant neoplasms, the T-cell immunophenotype prevails (69%), which is quite rare in the general population.

Leukemia and Lymphoma

0033: Double-stranded DNA breaks and the reparative properties of lymphocytes in patients with acute leukemias

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Keywords: leukemia, cancer, chemotherapy

Objective: Double DNA breaks are accompanied by phosphorylation of histone yH2AX in the area of the damaged site, forming at the same time a platform for protein factors involved in the cellular response to damage formation.

Methods: We prospectively conducted a comparative analysis of the double-stranded DNA breaks and the reparative properties of lymphocytes in 176 blood samples. 30 - conditionally healthy children, 62 – with primary AL, 8 – relapse of leukemia and 76 patients with primary AL in the dynamics of chemotherapy.

Results: In the group of conditionally healthy patients, the average number of double-stranded DNA breaks was 116.23, while the number of DNA repairs made up 32.3. The ratio between the number of breaks and repairs was 3.6. In the group with primary AL, the average number of double-strand breaks was 32.3, which is three times lower than the corresponding indicator in the control group, while the number of reparations was 109.3. The ratio between DNA breaks and repair in children with primary OL was 0.30, which significantly differs from the corresponding indicator of the control group. The use of prednisone in patients with ALL caused an increase of the double–strand breaks to 142.7 (more than 4 times) with a concomitant decrease in reparative properties. In patients with AML on the 15th day of cytostatic treatment, a decreased number of ruptures as well as reparations was detected. On the 33rd day of the protocol, we revealed a significant increase in both the ruptures and the repair rate, while all patients responded positively to the course of treatment. Patients with relapse had high level of ruptures compared to reparation

Conclusions: Conditionally healthy children were characterized by a large number of double-strand breaks compared to the repair index. Primary patients with AL had significant alterations in the DNA breaks/repair ratio.

Leukemia and Lymphoma

0036: Morbidity with incorporation of rituximab in Burkitt lymphoma protocol

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Keywords: burkitt lymphoma, childhood cancer, targeted therapy

Objective: Burkitt lymphoma has an excellent outcome with survival rates of 80 -90%. Rituximab has an added benefit in improving survival to nearly 95%. This study analyzed the toxicity of rituximab added to chemotherapy.

Methods: Retrospective review of 60 children serially diagnosed with Burkitt lymphoma from January 2016 – September 2022.

Results: There were 53 males and 7 females, mean age – 5.9 years. Stage – 1 -0, 2-7, 3-40 & 4-14. Group A- 3, B-44, C-13. One third of the children were undernourished. Protocol received – LMB-95 – 24, LMB-95 + rituximab - 23, GRAB (Good risk and Burkitt) – 10. Rituximab given in 24 patients (LMB -23, GRAB – 1). Three patients expired in the first week of treatment. Morbidity and mortality between rituximab and non- rituximab groups were compared. Morbidity: Episodes of febrile neutropenia (FN): 105, LMB-95 -38, LMB-95+Rituximab -59, GRAB -8. The number of FN episodes, the total duration of hospital stay, were higher in the patients who got rituximab, 61 in 24 patients vs 44 in 33 patients (p=0.001), 25.1 (20.8) vs 11.25 (10.33) days, p=0.002. ICU care was required in 6 of 61 episodes in the rituximab group vs 3 of 44 episodes in non-rituximab group, p=ns. Mortality: Eleven patients died, 3 in the first week of induction with 2 deaths due to tumor lysis. We documented a treatment related mortality (TRM) of 18.3 %, 73 % attributable to sepsis.

No statistically significant association of TRM found with nutrition, hypoalbuminemia, stage, group, LDH and addition of rituximab.

Conclusions: Disease free survival is 70% with relapse/ progression in 11%. High TRM of 18% is the dark reality of cancer care in LMICs, with sepsis being the major killer. Addition of rituximab significantly increased toxicity. Infection control is imperative to improve outcomes. Protocols require tailoring as per availability of supportive care.

Leukemia and Lymphoma

0037: Immuno-oriented approach for pediatric anaplastic large cell lymphoma

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Keywords: ALCL, non-Hodgkin lymphoma, childhood cancer

Objective: Anaplastic large cell lymphoma (ALCL) is a rare non–Hodgkin lymphoma, accounts 10-15% in the structure of non-Hodgkin lymphomas in children, originating from post-thymic T-cells. Depending on the presence or absence of expression of T-cell markers, there are T- and NK immunophenotypes. T-immunophenotype is associated with an unfavorable prognosis. There are different approaches to ALCL therapy, which include intensive "block" therapy or programs similar to those used in the treatment of acute lymphoblastic leukemia. Regardless of the protocol used, event-free survival is 65-75%. Taking into account the adverse effect on the prognosis of the expression of T-cell markers in ALCL, a protocol for the treatment of ALCL-NII DOiG-2003 was developed, which considers the immunological features of the tumor, and includes maintenance therapy with vinblastine 6 mg / m2 intravenously for 6 months from the end of treatment. Aims

To evaluate the effectiveness of therapy according to the ALCL-NII DOiG-2003 protocol compared with the NHL-BFM 95 protocol.

Methods: In the period from 19.10.1994 to 03.11.2022, 86 patients with a newly diagnosed ALCL were included in the study. Depending on the therapy program (NHL-BFM 95, n=38; ALCL-NII DOiG-2003, n=48), there were 2 groups of patients. Male/female ratio, according with the programs NHL-BFM 95 and ACCL-NII DOG-2003, was 1.5:1 and 1.3:1. The majority of patients were diagnosed with advanced stages of the disease: stage III in 45% (NHL-BFM 95) and 43% (ALCL-NII DOiG-2003), Stage IV in 42% and 28%, respectively.

Results: Overall survival in patients treated with the NHL-BFM 95 protocol was lower (76.3%) compared to patients treated with the immuno–oriented program - 97.9%. Event–free survival rates were 63.2% and 95.8%, relapse-free - 65.8% and 95.8%, respectively. Medial follow up was 15 years.

Conclusions: Thus, the usage of a differentiated, immuno-oriented approach to ALCL therapy is more effective and allows to achieve higher survival rates.

Leukemia and Lymphoma

0038: Outcome of children and adolescents with recurrent/refractory classical Hodgkin lymphoma: single center experience

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Keywords: Hodgkin lymphoma, cancer, relapse

Objective: Despite intensive treatment of primary Hodgkin lymphoma (HL), approximately 10-30% of patients develop progression or relapse of the disease. Targeted therapy, such as brentuximab vedotin (BV), is able to improve survival in patients with relapses/refractory forms of classical HL (R/R). We aimed to present our experience in treatment of R/R HL.

Methods: From January 2018 to March 2023 fifteen children with early relapse - 7 (50%), late relapse – 2 (14%) and refractory – 6 (36%) HL were enrolled in the study. Average 5,5 – 18 years (14,5±4,1 years), males were 5 (33,4%) and females - 10 (66,6%). Nine patients received ViGePD + BV chemo followed by autologous hematopoietic Stem Cell Transplantation (autoHSCT) with CEAM regimen. Median number of BV infusions – 4 (2-6). The treatment was well tolerated, the toxicity profile was similar to that in previously published studies.

Results: Overall response rate – 100%, complete response – 12 (80%), partial response – 3 (30%). DFS was 90,3±8,7%, n=15 with an average follow-up duration of 56,8±3,9 months. High-dosed therapy (HDT) with auto-HSCT was performed in 9 out of 15 patients. Reasons for the rejection of the auto-HSCT: 2 patients with late relapse with a complete response to 2d line chemotherapy, 2 patients with refractory disease who achieved complete remission after 4 courses of ViGePD+BV -

refusal of HSCT at the request of parents, 2 patients are under treatment and auto-HSCT in plan. Out of 15 patients, relapse developed in 1 patient with refractory course of HL, in the early time after auto-HSCT (2 months later). She started immunotherapy with 16 injections of nivolumab, Complete metabolic response (DC2) after 3 months of nivolumab administration. Since January 10, 2021 – does not receive treatment, remission persists for 26 months.

Conclusions: Thus, intensive therapy of children with relapsed and refractory form of HL can cure most patients. BV in combination with ViGePD significantly improved results of treatment of R/R HL in children and adolescents (4-year DFS is 90.3%).

Leukemia and Lymphoma

0039: Emerging genetic mutation should be looked for in patients with prolonged thrombocytopenia and myelofibrosis

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Objective: Despite myelofibrosis (MF) being a rare disorder in children, a new homozygous genetic mutation in MPIG6B also called G6B has been emerged in many published cases with myelofibrosis, thrombocytopenia and anemia. Most of these cases are Arabs which mandate looking carefully for myelofibrosis and this genetic mutation in patients with prolonged thrombocytopenia in such ethnicity. This work will summarize the clinicohematopathological features, the possibility of immune dysregulation and the currently available treatment options and recommendations of such emerging disease

Methods: We reviewed 19 Cases that were recently published of with prolonged

thrombocytopenia, myelofibrosis, and homozygous genetic mutation in MPIG6B

Results: Of the 19 published cases with congenital thrombocytopenia and myelofibrosis caused by MPIG6P homozygous mutation, male to female ratio was 1.2: 1, the disease was common in Arabs 79 % of reported cases. More than 70 % of cases were presented within the first 2 years of life with thrombocytopenia, anemia, and focal myelofibrosis, peripheral blood smear showed large platelet with anisopoikilocytosis in around 97 % of cases, as well as teardrops in more than 80%. Bone marrow analysis in most of the reported cases were hypercellular with adequate megakaryocytes, mild focal fibrosis and was infiltrated by lymphocytes at early age but in those with serial marrow assessment lymphocytes infiltration disappeared and myelofibrosis became progressively sever within years raising a possibility of immune dysregulation. 79 % of cases were treated supportively with platelet/ PRBC transfusions, splenectomy, multiple vitamins, while 21 % undergo HSCT, with a report of death in one case post HSCT, no major events have been reported in other cases

Conclusions: Patients with prolonged thrombocytopenia and anemia, should be looked carefully for myelofibrosis and G6P mutation as it looks that many cases are underreported, the follow up of such patients will allow us learn more about the clinical progression, and the possibility of immune dysregulation as well as the need for HSCT.

Leukemia and Lymphoma

0066: Total body irradiation for children with poor risk acute leukaemias

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Keywords: radiotherapy, acute leukemia, children

Objective: Acute lymphoblastic leukemia (ALL) in children with high risk has a poor prognosis. Allogeneic hematopoietic Stem Cell Transplantation (allo-HSCT) with total body irradiation (TBI) conditioning improves outcome for these patients. We reviewed our treatment experience of children diagnosed with high-risk ALL and received total body irradiation.

Methods: Nineteen (19) children with high-risk acute lymphoblastic leukemia\lymphoma received TBI containing conditioning prior to allogeneic Stem Cell Transplantation from February 2022. Five patients (26%) were in the first remission, 14 patients (73%) were in the second one. All patients have negative MRD status prior to allo-HSCT. Preparatory regimen consisted of total body irradiation 12 Gy in 6 fractions.

Results: Acute toxicity included oropharyngeal mucositis, nausea and fatigue. One patient has developed radiation pneumonitis 15 days after TBI. Two children relapsed after 3 and 4 months and received further treatment with second transplantation. The actual disease-free survival rate is 89.5%. All patients are alive from one to 13 months (median, 6 months) after allo-HSCT.

Conclusions: Conditioning regimens containing TBI prior allo-HSCT are well tolerated and effective in our clinic but future patients monitoring is needed.

Leukemia and Lymphoma

0091: Effect of salvage therapy on pediatric refractory or relapsed anaplastic large-cell lymphoma

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Keywords: ALCL, B cell lymphoma, salvage therapy

Objective: The outcome of anaplastic large cell lymphoma is inferior to mature B cell lymphoma. Some patients with refractory/relapsed anaplastic large cell lymphoma could be salvaged under the treatment of various therapies. The aim of study is to analyze clinical characteristics associated with childhood refractory or relapsed anaplastic large-cell lymphoma (R/R ALCL) and outcome of R/R ALCL treated with salvage therapy.

Methods: The clinical data of R/R ALCL patients under the age of 18 years old who received salvage therapy in the Sun Yat-sen University Cancer Center from November 2010 to October 2020 were retrospectively analyzed. The descriptive methods were adopted to review clinical

features. The overall survival (OS) and event-free survival (EFS) were analyzed with the Kaplan-Meier method.

Results: A total of thirty-five patients were included in the study, of which 22 cases were in the setting of relapsed condition and 13 cases were refractory. Salvage therapy was administered as follows: gemcitabine 15 cases, vinblastine 17 cases, crizotinib 14 cases, anti-CD30 antibody one case and multiagent chemotherapy 13 cases. Objective response rates of single gemcitabine and vinblastine were 46.7% and 64.7%, respectively. After a median follow-up of 58.0 months, the median survival time was not reached. The 3-year EFS and OS rates were 68.5% ± 8.4% and 35.8% ± 8.8%, respectively. Twenty-three patients were in continuous remission, 9 in CR and 12 died until the last follow-up.

Conclusions: Pediatric patients with R/R ALCL could still have probability of achieving complete response after receiving salvage therapy and have continuous remission.

Leukemia and Lymphoma

0097: Relapsed childhood acute lymphoblastic leukemia; a single center study, based on ALL Rez BFM 2004 protocol immunotherapy

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Keywords: ALL, relapse, immunotherapy, monoclonal antibody

Objective: With the development of intensive chemotherapy programs, supportive care, hematopoietic Stem Cell Transplantation long-term survival of children with initially diagnosed acute lymphoblastic leukemia (ALL) tends up to 85-90%. However, ALL relapses develop in 10-15% of patients, and unfortunately, it is not possible to achieve remission using only intensive chemotherapy. It has been shown that using monoclonal antibodies, such as anti-CD19 bispecific monoclonal antibody - blinatumomab, can increase survival of children with ALL relapse. The aim of our non-cohort study was to analyze the results of treatment of children with ALL relapses at the N.N. Blokhin National Medical Research Center of Oncology, Department of Children Hematology №1, №2. Therapy was based on the ALL-REZ BFM 2002 protocol in combination with blinatumomab.

Methods: In our clinic from 2018 to 2023, 33 children from 4 to 17 years old were treated, the average age was 9.2 ± 3.8 years, 24 boys (72.7%), and 9 girls (27.3 %). Therapy was performed

according to ALL-REZ BFM 2002 protocol. ALL from B-precursors was diagnosed in 30 patients (90.9%), from T-precursors in 3 patients (9.1%). Patients were divided into risk groups according to protocol criteria: S1 in 1 patient (3.0%), S2 in 25 patients (75.8%), S3 in 2 patients (6.1%), S4 in 5 patients (15, 4%). All patients received induction according to ALL-REZ BFM 2002 protocol. Response after each course was estimated by the bone marrow aspirate results and minimal residual disease (MRD). If the refractoriness of the disease was noticed, the patient was proceeding to the third-line chemotherapy regimen with fludarabine (FLAI\FLAM). After protocol completion, were determined indications for blinatumomab, based on the residual expression of target antigen (CD19). When the level of MRD was ≤〖10〗^(-3), patient proceed to allo-HSCT.

Results: M1 response after induction was achieved in 21 (72.7%), M2 - in 2 (6.1%), in other cases, remission was not achieved (21.2%). MRD-negative status after induction was achieved in 14 (42.4%) patients, 19 (57.6%) are still MRD-positive. No cases of induction death were noted. Blinatumomab was successfully applied in 7 patients (21.2%), all patients were MRD-negative after one full cycle. There were no unfavorable effects associated with blinatumomab. Overall survival of the entire group was 64.9% ± 11.5%, average follow-up 50.2 ± 6.3 months. Relapse-free survival was 30.0%±12.7%, while the relapse-free survival of patients who received blinatumomab before allo-HSCT, was 57.1%±24.9%, with a mean follow-up of 25.0±5.6 months. Event-free survival was 28.4% ± 12.3%, in patients who received blinatumomab, it was higher - 66.7% ± 27.2%.

Conclusions: In our study, the use of blinatumomab in combination with standard anti-relapse chemotherapy can help to achieve MRD-negative remission, and successfully perform allo-HSCT.

Leukemia and Lymphoma

0117: Diagnosis and treatment results of children with acute myeloid leukemia with the chromosomal translocations

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Keywords: acute myeloid leukemia, chromosomal translocations, pediatric oncology, molecular genetic defects, survival rate

Objective: To analyze laboratory data and the results of therapy in children with acute myeloid leukemia (AML) with individual chromosomal translocations.

Methods: Medical histories of 157 patients with AML who received treatment at the Scientific Center of Pediatrics and Pediatric Surgery in Almaty, Kazakhstan in the period from 2017 to 2021 years were evaluated. To analyze the survival rate of the patients Kaplan Meier method was used.

Results: Various chromosomal translocations were found in 49 (31%) out of 157 patients. M1-2 morphological variant identified in 47%, M3 in 43%, M4, M5a and M5b variants identified in one patient each. Co-expression of lymphoid markers occurred in 32% of children. Among the identified aberrations translocation t(8;21) (q22;q22);RUNX1-RUNX1T1 occurred in 51% of cases, translocation t(15;17)/PML/RARA in 43%, and t(3;14), t(11;15) and t (4.11)(q21.q23) were identified in one case each. According to the results of therapy, the survival rate for children with AML having translocation t(8;21) (q22;q22)/RUNX1-RUN X1T1 was 60%. The survival rate of 21 children with translocation t(15;17)/PML/RARa was 64%. Patient with t(3;14) developed an

isolated bone marrow relapse 8 months after therapy started. One child with t(4.11)(q21.q23) had hematopoietic cell transplantation and is alive. Now is under observation. The patient with t(11;15) is in complete remission for 2 years.

Conclusions: Identification of molecular genetic defects before the therapy starts is an additional marker of the prognosis of the disease course and monitoring the effectiveness of therapy. In our study, 49 (31%) patients with AML had various genetic translocations. Translocation t(8;21) and translocation t(15;17), occurred most frequently, 51% and 43% of cases respectively. Out of 49 patients with translocations, a third (32%) had a mixed immunophenotype with co-expression of lymphoid markers. The survival rate of 25 AML patients with t(8;21) (q22;q22)/RUNX1-RUN X1T1 translocations was 60%. Survival of 21 patients with t(15;17)/PML/RARa translocation occurred in 64% .

Leukemia and Lymphoma

0119: Pediatric acute myeloid leukemia and impact of nutritional status – outcome from a government facility in north India

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Keywords: acute myeloid leukemia, nutritional status, malnutrition, mortality, developing countries, survival rate

Objective: Childhood Acute Myeloid leukemia (AML) remains a life-threatening malignancy with a current survival rate of around 70 % in developed countries with effective support care. In developing countries, it varies from 25 to 53%. Prognosis has been linked to several factors, such

as nutritional status. To study impact of malnutrition on mortality in AML

Methods: The data presented has been prospectively collected between April,2017-March,2023. Children 0 – 18 years diagnosed with AML and mixed phenotype acute leukaemia with myeloid component were included. Patients primarily treated elsewhere and referred here at relapse were included. Treatment consisted of cytarabine with anthracycline induction 2 cycles followed by high dose cytarabine based intensification. APML was managed with PETHEMA 2005 protocol. Relapsed AML was managed with 2 cycles of FLAG followed by bone marrow transplantation. Venetoclax-Azacytidine was used in patients refractory to FLAG or not fit. Nutritional status and frequency of malnutrition in these patients was studied.

Results: During the study, 62 patients were diagnosed with AML (AML:50, APML:8, MPAL:4) at our center. 7 children with relapsed refractory AML were referred for further treatment. Median age was 8.5 years (0.4-18 years), M:F 1.3:1. As per WHO risk stratification, 13 were high risk, 23 intermediate and rest had favorable risk genetic profile. FLT3 ITD was seen in 10 children at diagnosis and 1 at relapse. All achieved morphological remission at the end of induction. Death: 4 in induction, 3 during intensification due to neutropenic sepsis, 7 after relapse during treatment, 2 post completion of treatment. 9 children discontinued treatment and 8 relapsed. 28 children are alive, in complete remission (follow up 2 years) 55%EFS. Nutritional status at diagnosis was assessed in 40 patients, 59% were malnourished. The rate of mortality in them was 31%. There was no significant difference in mortality of malnourished vs non-malnourished children (p-value 0.96, 95%CI-0.34-0.36).

Conclusions: The survival data of AML is sparse from LMIC. With standard protocols, more than 50% AML children survive the disease. No statistically significant relationship was found between the nutritional status of children outcomes (death) in AML.

Leukemia and Lymphoma

0120: Incidence and mortality of childhood acute myeloid leukemia in Armenia

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Keyword: acute myeloid leukemia, childhood leukemia, incidence, mortality, Armenia

Objective: Acute myeloid leukemia (AML) is a malignant disorder of the bone marrow characterized by the clonal expansion and differentiation arrest of myeloid progenitor cells. AML is the fifth most common malignancy in children, and the prognosis for AML in children remains relatively poor. Although survival rates for AML have greatly improved over the past several decades, overall survival for children with AML is approximately 65-70%, which is lower when compared to children with ALL.

Methods: This study included cases of children aged 0–18 years diagnosed with AML from 2010 to 2020. Data for this study were derived from medical records of patients diagnosed and treated at Hematology center after Prof. R. H. Yeolyan.

Results: A total of 388 cases of childhood acute leukemia were identified, of which 41 (11%) cases were with AML. The median age at diagnosis was 15 years and 62% (n=25) were male. Out of all AML patients, 7 (17%) cases were diagnosed with acute promyelocytic leukemia (APML), while 5 (12%) cases were diagnosed with acute myelomonocytic leukemia (AMML). The incidence of the disease was 0.14 per 100,000 population in 2020, and the mortality rate was 34% among the

studied patients. The mortality rate was particularly high in the first year, with 7 reported cases. **Conclusions:** This is the first nationwide study to describe the incidence and mortality of childhood AML in Armenia between 2010 and 2020. It provides a basis for assessing the quality of AML treatment in the country. However, further research is needed to understand the biological and clinical predisposing factors of the disease, as well as predictors of mortality from AML among children.

Leukemia and Lymphoma

0121: Primary cutaneous anaplastic large cell lymphoma: a case report

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Keyword: lymphoma, anaplastic cell lymphoma, case report

Objective: Primary cutaneous T cell lymphomas belong to a rare type of lymphomas that are primarily discovered in the skin with no evidence of extracutaneous involvement. Because of their rarity in the pediatric population the data about these diseases in children is limited. This report aims at presenting a clinical case devoted to primary cutaneous anaplastic large cell lymphoma in a child.

Methods: Retrospective and prospective analyses of a 10-year-old boy's medical record was performed.

Results: In 2018 a 5-year-old boy was diagnosed with primary cutaneous anaplastic large-cell lymphoma (III stage) based on histology and IHC studies (CD45+; Vimentin; Granzyme B+; CD45RO+; CD30+; ALK-; Ki67=80-85%). The patient received treatment according to NHL-BFM-2012 protocol. After the treatment had been finished, PET-CT which was performed showed that remission was achieved. Three months later new cutaneous lesions were observed again. Histology and IHC confirmed primary cutaneous anaplastic large-cell lymphoma relapse. The patient received vinblastine monotherapy for the following two years. Two months after the completion of treatment new lesions of skin appeared. Histology and IHC confirmed primary cutaneous anaplastic large-cell lymphoma (CD45RO+; CD30+; Granzyme B+; ALK-; Ki67=90-95%), and Crizotinib treatment was started. In July 2021 lesions of the temporal region were discovered. Crizotinib treatment decreased this lesion in size, but another lesion was developed in the mid-axillary line on the left side of the chest. Neither the bone marrow biopsy nor the CT scan revealed any pathological lesions. However, the presence of skin lesions indicated the possibility of an underlying condition that required further investigation. The treatment was continued with low-dose MTX (20-30mg/week) for a year. One month after stopping MTX therapy a new lesion was detected. Low-dose MTX treatment was resumed.

Conclusions: This is the first report presenting primary cutaneous anaplastic large cell lymphoma diagnosed in a child in Armenia and outlining the management of this rare lesion. During treatment four line therapies have been applied. The importance of individualized treatment options has been shown.

Leukemia and Lymphoma

0134: Comparison of day 33 outcome and safety of Escherichia coli asparaginase and Peg-asparaginase in children and young adults treated with BFM ALL IC 2009 protocol

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Keyword: Escherichia coli asparaginase, Peg-asparaginase, BFM ALL IC 2009 protocol

Objective: The induction backbone of the BFM ALL IC 2009 protocol is a four-drug regimen: prednisolone, vincristine, daunorubicin, and L-asparaginase. PEG-asparaginase can maintain prolonged trough levels due to a longer half-life compared to E coli asparaginase. Prolonged asparagine depletion is associated with a better antileukemic effect. So, we evaluated the efficacy and safety of the two l-asparaginase in acute lymphoblastic leukemia (ALL) induction therapy.
Methods: We did a retrospective study of children, adolescents and young adults (AYA) with ALL who received treatment with BFM ALL IC 2009 protocol in the year 2022 to 2023. Patients were divided into two groups. Group A: received E coli l asparaginase, and Group B: received either two doses of PEG-Asparaginase or one dose of PEG plus four doses of E coli asparaginase. We evaluated the efficacy by Day 33 complete morphological response (CR) and minimal residual disease (MRD) by flow cytometry. Adverse events were noted as per Common Terminology Criteria for Adverse Events (CTCAE) Version 5.0.

Results: Group A and B had 19 and 11 patients respectively. There were three mortalities unrelated to L-asparaginase in group A only. In groups A and B, CR was seen in 79% and 100% of patients, respectively (p-value: 0.01). In groups A and B, MRD negativity was seen in 59% and 82% of patients, respectively (p-value: 0.18). In groups A and B, median fibrinogen levels were 0.63 g/L (range: 0.35–1.85 g/L) and 0.64 g/L (range: 0.35-0.91 g/L) respectively. There was no grade 3-4 bleeding in either group. The median cryoprecipitate requirement in group A was 7; in group B, it was 21. No other L-asparaginase-associated side effect was seen in either group.
Conclusions: PEG-asparaginase is associated with better CR rates. Hypofibrinogenemia was common and manageable toxicity with prophylactic cryoprecipitate transfusion. The drawback of the study is the small sample size.

Leukemia and Lymphoma

0144: High-risk acute promyelocytic leukemia with unusual T/myeloid immunophenotype diagnosed T-cortical acute lymphoblastic leukemia after maintenance therapy

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Keywords: Acute promyelocytic leukemia, childhood cancer, PML/RARA

Objective: Acute promyelocytic leukemia (APL) is an oncologic emergency due to the high mortality rate from hemorrhage and disseminated intravascular coagulation. Clinical outcomes for

patients with acute promyelocytic leukemia (APL) have improved dramatically in the last 25 years, but a small proportion still dies early during induction or relapse after achieving remission. **Methods:** The morphological evaluation was performed on Wright-Giemsa-stained peripheral blood and bone marrow aspirate smears, and hematoxylin and eosin-stained core biopsy sections. **Results:** In 2018 a 16-year-old girl was diagnosed with Acute Promyelocytic Leukemia M3 (AML M3) with an expression of T cell markers represented by CD2, sCD3, and CD5. At first, the patient was presented with pancytopenia in peripheral blood (PB), and the bone marrow (BM) was hypoplastic. Further, performed BM aspiration and flow cytometry presented with positive CD45 (95%), CD19 (28%), CD22 (69%), CD34 (35%), cyMPO (56%), sCD3 (36%), CD99 (80%), CD5 (40%), CD2 (87%) markers. The abnormal t(15;17) PML/RARA translocation was identified by metaphase cytogenetics and confirmed by FISH in 15% of nuclei. Treatment started with PETHEMA/HOVON-2005 protocol. Follow-up bone marrow biopsy after the initiation of induction chemotherapy t(15;17) PML/RARA translocation was negative. After the end of maintenance therapy (MT) the abnormal t(15;17) PML/RARA translocation was negative by the FISH method. Nevertheless, after 2 months of MT, the patient was diagnosed with Acute Lymphoblastic Leukemia (ALL), T-cortical type. Treatment was started according to GMALL protocol, and complete remission was obtained. **Conclusions:** Based on our experience, t(15;17) APL with aberrant expression of T cell markers behaves more similar to APL, and the T/myeloid phenotype does not abrogate the good prognosis conferred by t(15;17) when an ATRA and ATO-based regimen is utilized.

Leukemia and Lymphoma

0145: The first Armenian double Ph chromosome-positive pediatric case with B cell precursor acute lymphoblastic leukemia

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Keywords: acute lymphocytic leukemia, pediatric ALL, philadelphia chromosome, BCR/ABL genes,

Objective: Philadelphia chromosome is an aberrant chromosome derived from t(9;22)(q34;q11) translocation. It is mainly found in Chronic Myeloid Leukemia(CML). Still, it is rarely found in Acute Lymphocytic Leukemia (ALL, up to 25% of adult cases, 2-5% in pediatric patients) and is associated with poor prognosis. Double Ph is typical in chronic myeloid leukemia (CML) but rarely (0.03%) found in pediatric ALL. We report here the case of a 13-year-old boy diagnosed with B precursor ALL with double Ph who is the first case in Armenia.

Methods: On admission, the patient had splenomegaly and lymphadenopathy. Flow cytometry and cytogenetic analyses were performed. The ZytoLight SPEC BCR/ABL1 dual color dual fusion probe was used.

Results: The immunophenotype of the blast population was the following: CD34 (93%), CD10 (98%), CD19 (97%), CD20 (32%), HLA-DR (94%), CD79a (98%), TdT (44%), CD22 (41%). We evaluated 200 interphase cells with three fusion signal BCR/ABL genes in 79% of examined interphase cells was found which is the typical picture of a double Ph chromosome. In conclusion, the final diagnosis was B-ALL with a double Ph chromosome.

Conclusions: Double Ph+ cases have been reported only in several pediatric ALL instances worldwide. However, the clinical significance of double Ph chromosomes in ALL is not known yet. It is shown that double Ph+ patients have even lower survival rates compared to single Ph+ patients. Even though we have remission after one month of the initial treatment, the clinical significance of the double Ph chromosome in B-ALL should be taken into account and needs long-term observation in the future, which will improve the treatment and monitoring of such cases.

Leukemia and Lymphoma

0146: Differences in the manifestation of hypofibrinogenemia between first and second dose of peg-asparaginase administration during induction of ALL treatment in children

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Keywords: Acute lymphoblastic leukemia, pediatric ALL, PEG-Asparaginase, hypofibrinogenemia

Objective: The treatment of children with acute lymphoblastic leukemia includes PEG-Asparaginase, and one of the most significant adverse events of PEG-Asparaginase therapy is decreased fibrinogen levels. This study aims to determine the prevalence of the adverse events differences between 1st and 2nd doses of Peg-asparaginase (Oncaspar) administration during induction treatment.

Methods: We performed a retrospective chart review of pediatric patients with B cell ALL aged between 0 to 18 years treated at the Pediatric Cancer and Blood Disorder Center of Armenia from January to December 2021. Adverse events results from 1st and 2nd dose of induction PEG-Asparaginase administration were reviewed.

Results: Overall, 21 patients were identified with B-cell ALL and treated according to the ALL IC BFM 2009 protocol. However, two patients' data were analyzed partially. Common adverse event hypofibrinogenemia was assessed among patients during the whole induction. Two patients who experienced Anaphylaxis Grade 3 after a second IV injection of the PEG-Asparaginase test dose they excluded from the study. 79% (15/19) of the patients required 46 Fresh Frozen Plasma (FFP) transfusions, with a mean fibrinogen level of 0.65 g/L. As opposed to this, 68% (13/19) of the patients received 26 FFP infusions following the second dosage, with a 0.64 g/L, nearly the same mean level of fibrinogen. 4 and 6 patients have not received FFP after 1st and 2nd dose of Oncaspar accordingly.

Conclusions: FFP injections were more frequently required after the first PEG-Asparaginase injection rather than the second injection during the induction of ALL treatment. However, the study is limited due to the small sample, and further studies with larger sample sizes are needed to confirm our result.

Leukemia and Lymphoma

0148: Clinical case of T-lymphoblastic lymphoma with a bulky disease and respiratory failure

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Keywords: Non-Hodgkin's lymphoma, T-lymphoblastic lymphoma, NHL-BFM

Objective: Non-Hodgkin's lymphoma (NHL) is a heterogeneous group of malignant lymphoid neoplasms formed from B-cell precursors, T-cell precursors, mature B-cells, or mature T-lymphocytes. Unlike adults, where low-differentiated, clinically indolent subtypes of NHL predominate, most cases of juvenile NHL demonstrate aggressive clinical behavior. And therefore, these types of tumors require immediate treatment.

Methods: Here, we report a case of a 4-year-old girl diagnosed with T-lymphoblastic leukemia/lymphoma III stages.

Results: Four-years-old girl was admitted to the intensive care unit (ICU) with complaints of cough, febrile fever, and shortness of breath. CT examination was conducted, which revealed an anterior mediastinal mass with sizes of 12.6 x 11.6 x 11.3 cm, compressing the trachea, and right bronchus,

causing partial atelectasis of the right lung. Laboratory tests revealed increased levels of lactate dehydrogenase (LDH) and ferritin. A percutaneous biopsy was performed, and a diagnosis of T-lymphoblastic lymphoma without bone marrow involvement was confirmed. The child's health conditions deteriorated rapidly; the seizures of the mass significantly increased in size within several days. The child had respiratory failure and was intubated. The multidisciplinary team decided to start the treatment according to the NHL-BFM 2012 protocol in the ICU unit. Treatment was initiated with steroids, and tumor lysis syndrome was managed according to the guideline. Within several days the child was extubated and referred to the pediatric oncology department for future treatment. Throughout the treatment, the child periodically had a spastic cough. The pulmonologist and allergologists detected no pathologies. Radiological examinations excluded the suspicion of progression, so positron emission tomography-computed tomography (PET-CT) was conducted, which indicated metabolic activity without an increase in size. However, PET-CT is not a standard for T lymphoblastic leukemia/lymphoma according to the European approach. Maintenance therapy was initiated, and a follow-up PET-CT study observed a decrease in metabolic activity and sizes of the mediastinum.

Conclusions: Urgent initiation of treatment in a life-threatening situation increases the chances of survival and saves lives.

Leukemia and Lymphoma

0152: Clinical development of ASTX727 (oral decitabine with cedazuridine) for MDS and AML

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Keywords: MDS, AML, ASTX727, decitabine, cedazuridine

Decitabine is a hypomethylating agent (HMA) and was approved by FDA for treatment of intermediate/high-risk MDS for IV infusion and by EMA for treatment of AML patients not fit for standard induction chemotherapy. Oral administration of decitabine, or other HMAs as single agents, has proven challenging as high first-pass due to metabolic degradation by cytidine deaminase (CDA) results in low bioavailability. Cedazuridine, a synthetic analog of tetrahydrouridine, is a potent inhibitor of CDA and oral combination with decitabine enhances the oral bioavailability of decitabine. Astex developed INQOVI®, oral decitabine+cedazuridine, and achieved approval of the label in US, Canada, and Australia, with the same indication as IV decitabine, using clinical pharmacology data as primary endpoint in the registrational phase-3 study which used, pharmacokinetic (AUC) equivalence against reference IV decitabine to demonstrate biological comparability. Additional supportive pharmacodynamic data (LINE-1 demethylation) were also used. Clinical efficacy and safety were secondary endpoints in phase-3. Details of development of oral decitabine/cedazuridine fixed-dose combination including nonclinical background; regulatory considerations; and clinical pharmacology endpoints comparing oral vs IV will be presented. Pediatric development program for ASTX727 is ongoing.

Benign Hematology

0014: Severe combined primary immunodeficiency in a 3.5-month-old infant

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Keywords: immunodeficiency, infancy, rare disease

Objective: Primary immunodeficiencies are relatively rare diseases, their incidence is 1 per 10,000 to 200,000 children. There is no PID register in Uzbekistan yet. We described a case study of severe combined PID with a confirmed by WGS.

Methods: A family with twins: a girl and a boy - at the age of 3.5 months applied to NCMC. Family history indicates a closely related marriage, children of 4 pregnancies. Previous pregnancies: 1st son - healthy, 2nd child - daughter died at the age of 2 months with the diagnosis of sepsis, 3rd child - girl, died at the age of 2 months with the diagnosis of sepsis. 4th child - twins: girl was relatively healthy, boy I.O. proband 3.5 months - old.

Results: Admitted with complaints of frequent bacterial infections, multiple pustular rashes on the scalp, limbs, perianal area, weakness, mucositis, diarrhea, prolonged fever for a month. Anthropometric parameters corresponded to age. Laboratory tests: CBC - WBC 1.02*109/l, RBC 1.92*1012/l , HGB 48 g/l, HCT 14.5%, PLT 42*109/l, NEUT 0.55*109/l, LYMPH 0.17 *109/l, CRP 68.95 mg/l, procalcitonin 4 µg/l. Stool: WBC 10-15/1, culture (Gram staining) without growth. Blood culture (Gram staining) - MRSE S.haemolyticus (sensitivity: amikacini, vankamicini, gentamicini). Immunogram: CD4/CD8 immunoregulation index - 0/1, IgA - 1.10 g/l, IgM - 0.55 g/l, IgG - 5.25 g/l. Reduced T-helper inducers. IRI has decreased. B-lymphocytes are reduced.

Activation of T-cytotoxic lymphocytes. Amikacin antibiotic therapy was started in the ICU. With suspicion of hypoglobulinemia, a solution of normal human immunoglobulin at the rate of 1 g/kg was injected, transfusion of irradiated red blood cell mass N2 was performed. His condition improved - temperature normalized, CBC- RBC 3.95*1012/L, WBC 2.02 *109/L, HGB 90 g/l, HCT 32.5%, PLT 150*109/L, NEUT 1.05*109/L, LYMPH 0.2*109/L. The stools were unchanged. After 3 days, the child started vomiting, diarrhea became more frequent, hemodynamic indices worsened, and he was transferred to the ICU with abdominal bloating. G-CSF N2 was administered to treat sepsis, WBC 7.02*109/L, NEUT 6.05*109/L. A review abdominal radiograph revealed free air under the diaphragmatic dome. Peritoneal sign was positive. Diagnostic laparotomy and abdominal cavity revision were performed with the diagnosis of intestinal perforation, enterocolitis. During the operation, perforation of the lower colon was detected; suturing was performed. Healing of the surgical wound was primary, perianal ulcers healed. Fever persisted throughout the postoperative period. Unfortunately, the boy's condition worsened due to progression of enterocolitis, ongoing bacterial sepsis. Based on the results of complete genome sequencing (postmortem), the diagnosis of severe combined primary immunodeficiency by autosomal recessive type was made.

Conclusions: The leading method in the diagnosis of this disease is the method of clinical investigation, which includes a thorough collection of the anamnesis, information about the patient's morbidity, the type of infectious agents, the presence of concomitant syndromes. It should be noted that closely related marriages increase the risk of giving birth to children with this pathology. Early diagnosis of children with suspected PID and further treatment with stem cell transplantation will allow to achieve complete recovery of these severe patients.

Benign Hematology

0028: Pseudothrombocytopenia at the hematology center in a developing country: manual vs automated platelet counting

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Keywords: pseudothrombocytopenia, platelet, developing country

Objective: Pseudothrombocytopenia is an in vitro phenomenon of platelets (PLT) agglutination that can lead to misdiagnosis, overtreatment, and even life-threatening interventions. The abnormal complete blood count (CBC) histograms before examination of blood smears are the first evidence of it. This study aims to reveal the incidence of pseudothrombocytopenia among patients with different hematological and oncological disorders.

Methods: This is a retrospective assessment of manual (stained with May-Grunwald method) and automated (with Sysmex XT, Sysmex XN1000 analyzers) PLT counts of 114 patients admitted to the outpatient and inpatient departments of the Hematology Center after Prof. R. H. Yeolyan during 2 months in 2019. All the samples were analyzed in the laboratory base of the same center which is the only hematology center in Armenia.

Results: Of these 114 patients, 50 (43.9%) were male and 64 (56.1%) were female. Eight of them had chronic myeloid leukemia (CML), 5 chronic lymphocytic leukemia (CLL), 3 acute myeloid leukemia (AML), 14 acute lymphoblastic leukemia (ALL), 3 multiple myeloma, 2 myelodysplastic syndromes (MDS), 4 myelofibrosis (MF), 6 lymphoma (Hodgkin and non-Hodgkin), 7 polycythemia vera, 5 essential thrombocythemia (ET), 11 immune thrombocytopenia (ITP), 2 aplastic anemia (AA), 14 nutritional anemia, one of each thalassemia, infectious mononucleosis, neuroblastoma, osteosarcoma, prostate cancer, 19 had no any diagnosed disease (4 of them were pregnant) and 6

weren't diagnosed yet. The means of the automated and manual PLT count results were approximately 235×109/L (with a median of 153×109/L) and 240×109/L (the median was 174×109/L), respectively. Automated counting revealed 55 patients with thrombocytopenia: 26 Grade1 (by manual count 11 of them were matching, 2 were Grade2, 13 had no thrombocytopenia), 10 Grade 2 (5 matching, 3 Grade 3, 1 Grade 1, 1 normal compared to manual), 9 Grade 3 (5 matching, 1 Grade 2, 2 Grade 4, 1 normal compared to manual), 10 Grade 4 (7 matching, 3 Grade 3 compared to manual) and by manual counting, 43 cases were detected:15 Grade1, 8 Grade 2, 11 Grade 3, 9 Grade4.

Conclusions: Our results confirm that the morphological examination of blood smears is necessary regardless of PLT count measured by automated analyzers because of obvious mismatching in diagnosis and staging. Moreover, in some cases, manual counting indicated a higher grade of thrombocytopenia. Further research may help to detect the real causes of pseudothrombocytopenia and to rule out the possible impropriety of blood sampling.

0126: Current status of thalassemia in Taiwan: molecular basis, clinical features, and treatment

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Keyword: thalassemia, molecular basis, treatment

Taiwan is located approximately 100 miles off the southeast coast of Mainland China and has a population of over 23 million people. The carrier frequency of β-thalassemia is currently estimated at around 2%, and the number of β-thalassemia major patients in Taiwan is around 500. The carrier rate of α-thalassemia is 4%, and there are 15-20 hemoglobin variants, mostly stable types. Some are unstable, such as Hb-C and E, which have come with the influx of foreign brides from Southeast Asia.

Thalassemia is an inherited blood disorder caused by mutations in the globin gene loci on chromosomes 16 and 11, which affect the production of α- or β-globin protein, respectively. Thalassemia is inherited as an autosomal recessive trait, and there are two main types: alpha and beta thalassemia, each with several subtypes. Thalassemia major is more severe, and patients require blood transfusions, while thalassemia minor is less severe. The most critical problems in these patients include iron overload, cardiac arrhythmia, hepatitis, osteoporosis, endocrine disorders, and typical signs and symptoms of anemia.

The combination of early diagnosis, improvements in monitoring for organ complications, and advances in supportive care have enabled many patients with severe thalassemia syndromes to live productive, active lives well into adulthood. Thalassemia major can be treated through regular blood transfusions, Stem Cell Transplantation, iron chelation therapy, stimulation of fetal hemoglobin production, including changes in expression and production of HbF, induction of fetal hemoglobin production using hydroxyurea, and the use of immunomodulator agents and gene therapy.

Here, we reviewed thalassemia disorders and discussed the molecular basis of the disease, clinical features, and treatment options.

Keywords: blood transfusion, chelation therapy, gene therapy, hemoglobin, iron overload, reactive oxygen species, splenectomy, thalassemia.

Benign Hematology

0132: The first confirmed case of IRIDA in Russian Federation

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Keyword: Irida, Russian Federation

Objective: Iron refractory iron deficiency anemia (IRIDA) is a rare inherited disorder caused by a defect in the TMPRSS6 gene. The loss of TMPRSS6 function causes iron deficiency due to inappropriately high hepcidin levels, with markedly reduced iron absorption and sequestration of iron in macrophages. This disease is characterized by microcytic, hypochromic anemia with low serum iron and transferrin saturation levels and normal/high serum ferritin values. Patients are

refractory to oral iron treatment but show partial response to intravenous ferrotherapy. We present the first genetically confirmed IRIDA case in a girl in Russia.

Methods: At the age of 5 the child was first examined by a hematologist with a history of chronic iron deficiency anemia and the absence of response to oral iron therapy. With additional examination thalassemia, celiac disease, inflammation, thyroid pathology, occult blood loss, were excluded. IRIDA was suspected, but genetic analysis for TMPRSS6 mutation by Direct Sanger Sequencing was feasible only in 2022.

Results: Physical development was average harmonious, pallor was observed. Hypochromic microcytic anemia (RBC 5.07 x 1012/l, Hb 8.0 g/dl, MCV 54.6 fl, MCH 15.8 pg) with low serum iron (1.6 µmol/l), transferrin saturation (4 %), and normal ferritin level (38.4 ng/ml) was detected. Taking into account the absence of response to oral iron, patients received intravenous ferrotherapy which resulted in moderate increase of Hb, MCV and ferritin, while serum iron and transferrin saturation remained very low. TMPRSS6 gene analysis identified heterozygous mutations in exon 2 (p.Trp64Ter) and exon 15 (p.Gly594Arg), as previously described.

Conclusions: We registered the first patient with IRIDA in Russia. In the presence of hypochromic microcytic anemia in pediatric patients, accompanied by inadequate response to iron therapy, we should bear in mind IRIDA in differential diagnosis. To confirm IRIDA, TMPRSS6 gene sequence analysis should be performed.

Stem Cell Transplantation

0002: Results of allogeneic hematopoietic Stem Cell Transplantation for relapsed and refractory acute leukemia: single center experience

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Keywords: acute leukemia, relapse, alloHSCT

Objective: Allogeneic hematopoietic Stem Cell Transplantation (alloHSCT) is an effective option for treatment of relapsed/refractory (R/R) acute leukemia. Modern approaches required to improve results of alloHSCT for R/R acute leukemias. We aimed to present our experience of alloHSCT for children with R/R acute leukemias.

Methods: Fifty-one patients were included. Pts. received alloHSCT between January 2021 and October 2022. Median age – 8.7 y.o. (5 months – 17 y.o). M/F=31/20. Diagnosis: ALL – 32 pts, AML – 17 pts, ABiL – 2 pts. Twenty-six pts. were in second CR, other pts – in first (high risk AML and refractory ALL). All pts. received alloHSCT in CR. Donors: haploidentical – 22 (43.1%), match related donor (MRD) – 19 (37.2%), matched unrelated donor (MUD) – 10 (19.6%). Graft source: BM – 14, PBSC – 37. Graft manipulation: haploidentical – 16 pts. underwent TCRαβ/CD19-depletion and 6 – PtCy. Conditioning regimens: ALL – TBI-based (12 Gy) in 26 pts, busulphan-based in 6 pts; AML/ABiL – treosulfan/thio (n=10) or treosulfan/melphalan (n=9) based. Pts. with TCRαβ/CD19- depleted grafts did not receive based immunosuppressive therapy (IST) for "graft

versus host" disease (GvHD) prevention (only abatacept/tocilizumab). Pts. with MUD/MRD received combined IST with abatacept and calcineurin blockers. Pts. with PtCy received additional ruxolotinib.

Results: All pts. engrafted with the median engraftment day 13 (9 – 24) after alloHSCT. Seven pts. relapsed (4 are alive now). At the median follow-up period of 13 months (2 – 23 months) the following survival rates were received. ALL OS – 78.1%, RFS – 73.4%; AML OS – 70.6%, RFS – 67.5%. GvHD 1-4 gr. rate was 72.5%, GvHD 3-4 gr. – 5.3%. Chronic GvHD developed in 7 children, 5 patients are currently receiving treatment. Infectious complications: febrile neutropenia – 96%, viral reactivation – 47.3%, mucositis – 78.4%, cystitis – 12.3%. TRM was 6% (GvHD, toxicity). Late mortalities: relapses. No significant difference was found in toxicity and GvHD incidence between haploidentical and MUD alloHSCT.

Conclusions: Our study showed efficacy and tolerability of alloHSCT for R/R acute leukemias treatment. Both TCRαβ/CD19-depletion and PtCy alloHSCT were effective and safe in our study. Most unsatisfactory results have been associated with relapses. Future studies required to estimate long-time follow-up.

Stem Cell Transplantation

0011: A clinical case of multiple post-transplant complications in the treatment of a patient with Wiskott-Aldrich syndrome

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Keywords: supportive care, Wiskott-Aldrich syndrome, hematopoietic Stem Cell Transplantation

Objective: Wiskott-Aldrich syndrome is a rare genetic disorder caused by mutations in the WAS gene. That syndrome primarily affects boys and is characterized by abnormal immune function and a reduced platelet number. A hematopoietic stem cell transplant (HSCT) is the mainstay of treatment that has a chance of providing a permanent cure.

Methods: A 2-year-old male patient (diagnosis was established and genetically confirmed) was treated at the Belarusian Research Center for Pediatric Oncology, Hematology and Immunology, where he underwent allogeneic unrelated HLA-compatible bone marrow HSCT. He had contracted COVID-19 before the transplant. The conditioning regimen included treosulfate, fludarabine, and Anti-thymocyte globulin. The patient received cyclosporine (CsA) and mycophenolate mofetil as a prophylaxis for "graft-versus-host" disease (GVHD).

Results: Engraftment was noted on day +16. Donor chimerism at day +30 was 100%. Engraftment syndrome was observed from day +7 with the transition to acute GVHD Grade III-IV (skin 3, liver stage 2, gastrointestinal tract stage 4). The patient received CsA, medrol, simulect, mesenchymal stem cells, and ruxolitinib to treat GVHD. In the post-transplant period, the patient had activated HHV6. The patient later developed thrombotic microangiopathy (TMA). As a

treatment, the patient received eculizumab No. 6, calcineurin inhibitor withdrawal, combined treatment of grade IV acute GVHD and infectious complications, transfusion support, and defibrotide. In dynamics, the child's condition worsened against the background of GVHD with severe gastrointestinal tract lesions, liver and skin, TMA and Acinetobacter infection, and intractable gastrointestinal bleeding developed and progressed despite combined therapy. The child died at +122 days after transplantation.

Conclusions: Despite ongoing treatment, the death of the patient was inevitable. Out of eight patients of the Center with Wiskott-Aldrich syndrome who received HSCT, six patients are alive (75%), and two patients, including the one described above, have died, which is comparable to the data described in the literature.

Stem Cell Transplantation

0012: The first experience of allogeneic Stem Cell Transplantation for the treatment of mucopolysaccharidosis I-Hurler in Belarus

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Keywords: hematopoietic Stem Cell Transplantation, mucopolysaccharidosis, enzyme replacement therapy

Objective: Mucopolysaccharidosis I-Hurler (MPS I-H) is rare (1:100 000) and the most severe form of a metabolic, genetic disease caused by a deficiency of the enzyme alpha-L-iduronidase (IDUA) and characterized by intense physical symptoms and cognitive decline. Currently, approved treatments include enzyme replacement therapy (ERT) and/or hematopoietic stem cell transplantation (HSCT) as the gold standard. In 2022 HSCT for MPS I-H patient was performed in Belarus for the first time.

Methods: Two patients with genetically proven MPS I-H performed allogeneic HSCTs based on the Center for Pediatric Oncology, Hematology, and Immunology. Genetic confirmation of the diagnosis and determining the level of IDUA activity were performed based on the Republican Scientific and Practical Center "Mother and Child." Both patients received ERT nine months before HSCT.

Results: The first patient (girl, two years three months) got the peripheral blood stem cells

(PBSC) from HLA-matched (10/10) unrelated donor (male, 54 y.o.), and the second one (male, two years and seven months) received haplo HSCT of PBSC (donor – mother, 26 y.o.) with α/β-depletion. Both patients indicate 100% donor chimerism on day +14. The level of IDUA activity was increased from 0.01 µmol/l/h (patient 1) and 0.01 µmol/l/h (patient 2) to 28 µmol/l/h and 13.4 µmol/l/h respectively by the day +36 (normal range – 12-24 µmol/l/h). Despite the presence of acute GVHD (up to grade 2), both patients showed a significant improvement in their general physical condition: • improved joint mobility and fine motor skills • a decrease in sputum levels in the lungs • a noticeable jump in cognitive functions.

Conclusions: In the early post-transplant period, patients with MPS I-H demonstrate a dramatic improvement in performance and restoration of the IDUA level to normal values, indicating the extreme effectiveness of the combination of ERT and HSCT for the radical treatment of these patients and improving the quality of life.

Stem Cell Transplantation

0032: Hyperbaric oxygen therapy for hemorrhagic cystitis after allogeneic transplant

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Keywords: hemorrhagic cystitis, acute myeloid leukemia, hyperbaric oxygen therapy, allogeneic transplantation

Objective: Hemorrhagic cystitis (HC) is an inflammatory hemorrhagic disease and condition that can be caused due to infectious (e. g. viruses) or non-infectious cause. This disease brings about different incidents of bleeding in mucosa parts of the urine bladder [1]. In severity of HC and the results of the treatments, there are substantial obvious differences. Some patients only have microscopic bleedings and in some patients, the symptoms appear in the lower parts of the urinary tracts [2]. Due to the many different clinical observations of HC disease, different methods of treatment are used. Methods such as antivirus medicine types like vidarabine, oxygen or ozone therapy, washing the urine bladder, formalin therapy, cystoscopy and even cystectomy are utilized for treatment. Each of these methods can lead to improved patient's health and certain complications.

Methods: A 40-year-old man, having acute myeloid leukemia (AML) received bone marrow transplantation during March 2017 at Imam Reza Hospital in Kermanshah. The donor was the patient's brother. After transplantation, the patient was discharged from the hospital with a normal condition. The result of the medical test chimerism in this patient was 95% which showed the highest transplantation matching. It is necessary to mention that despite the training are given

to the patient and his family about the procedure and the process of the treatment and the necessity of on-time consumption of the medicine; unfortunately, neither the patient nor his family paid attention to the on-time consumption of the medicine and the necessary dosage. Ozone therapy inside the urinary bladder for curing hematuria was done for the first time in Iran. This method, by blocking capillaries and very small vessels of the urinary bladder, stopped the bleeding. All of the primary and routine treatment was done for the patient, but the responses were not very significant. Despite all these, using ozone therapy, valuable results were achieved and the patient became stable.

Results: In the present study, we also found that HBO treatment for this patient with HC with severe clinical symptoms of hematuria and abdominal pain was successful. In the first stage of the treatment, several bladder washes were performed several times, Hyperbaric oxygen therapy (HBOT) was chosen for the last action, which resulted in valuable results, the patient's bleeding was completely discontinued and the patient's condition returned to normal.

Conclusions: Regarding surveying all the possible causes of hemorrhagic cystitis, especially the viral and infectious causes. We found that the complication of GVHD was supplemented treatments that managed to control hematuria by using the ozone therapy method. Given the patient's sensitive conditions and the lack of attention to taking medications, it was possible that GVHD would occur in this patient as HC. Following the referral of the patient to the hospital, various treatment methods were used. But only after ozone therapy, the patient's bleeding was completely stopped and he returned to normal conditions. We used ozone therapy for HC for the first time in Iran and fortunately had valuable results.

Stem Cell Transplantation

0071: Results of high-dose chemotherapy with autologous transplantation in Hodgkin's lymphomas in children

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Keywords: Transplantation, Hodgkin lymphoma, chemotherapy

Objective: Hodgkin's Lymphoma (HL) - tumor of lymphoid tissue with clonal proliferation of B - cells. Modern treatment has made it possible to have 5-year survival among advanced stages in 95% of cases. Despite this fact 15% of patients have no response to standard treatment approaches or they have early relapse. Hematopoietic Stem Cell Transplantation has been performing since 2012 at the Scientific Center for Pediatrics and Pediatrics Surgery, Kazakhstan.

Methods: A total of 17 auto-HSCTs were performed; there were 10 boys and 7 girls. Five patients had progressive disease on the first line therapy, nine patients had first relapse, one patient was with the second relapse and two patients were with the fourth relapse. The median age at the the time of the HSCT was 11 years (ranging between 5-16 years). In all cases, there was a standard BEAM conditioning regimen. The median number of transfused CD34 + cells per 1 kg of patient body weight was 6.8 * 106/kg (2.4-13.2*106/kg).

Results: All patients had graft engraftment. The recovery of leukocytes (> 1.0 * 109/l) in patients was observed on the 11th (9-16th) day, the restoration of platelets (> 20 * 109/l) was observed on

the 13th (10-20th) day. None of the patients died in the early post-transplant period. The median follow-up was 70 (14-129) months. Five patients developed a relapse.

Conclusions: 1. The 5-year overall survival patients with Hodgkin's Lymphoma was 82.5% ± 11.5%, the 5-year event free survival was 68.2% ± 11.8%, which is consistent with international studies. 2. High-dose chemotherapy with autologous hematopoietic Stem Cell Transplantation is an effective line of therapy for patients with relapsed and refractory Hodgkin's course. 3. The main prognostic factor for the effectiveness of HDCT + auto-HSCT is achieving a complete response before high-dose therapy.

Stem Cell Transplantation

0072: Hematopoietic stem cell collection in children under 15 kg with malignant disorders: single center experience

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Keywords: Hematopoietic Stem Cell Transplantation, children, stem cells

Objective: Hematopoietic stem cell (HSC) transplantation is important consolidative therapy for children with malignant disorders. Adequate number of HSC required for transplantation. HSC collection for children under 15 kg is a problem that requires a special analysis. We aimed to represent our experience of HSC collection for this group of children

Methods: Overall, 30 pts. were included in our study. Filgrastim was used for mobilization, no plerixafor used in this group of children. Age median was 30.6 (12-48) months. M/F=13/17. Median body weight was 12.2 (7.8-15) kg. CVC was used for apheresis on Spectra Optia for HSC collection. Collection was performed in the ICU department for safety reasons. Separator was filled by donors' erythrocyte suspension in all cases.

Results: All pts. alive. No severe complications registered. Two pts. required CVC replacement. Median of received dose of CD34+ cells was 13.9x10^6/kg (0.04-92.0x10^6/kg). Two pts. received second apheresis due to low number of CD34+ cells. Median duration of apheresis was 251 (160-415) mins.

Conclusions: Our experience of a big group of pts. under 15 kg showed the safety and tolerability of the method of HSC collection for such pts. No severe complications were found. Median HSC dose was quite good and enough for successful HSC transplantation.

Stem Cell Transplantation

0073: Cell therapy for malignant neoplasms in children: experience of the N.N. Blokhin maintopic: Stem Cell Transplantation

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Keywords: Cell therapy, children, Stem Cell Transplantation

Objective: Autologous hematopoietic Stem Cell Transplantation (aHSCT) is a method of consolidative therapy in pediatric cancers. One of the key aspects is the improvement of results with less organ toxicity. Big groups of pts. require to be analyzed. We aimed to represent the experience of aHSCT for children with malignancies in our center and estimate safety and tolerability of the method.

Methods: Overall, 159 pts. received 185 aHSCT in 2021-2022 (during 23 months). Diagnosis: Hodgkin disease (HD), non-Hodgkin lymphoma (NHL), neuroblastoma (NB), Wilms' tumor (WT), germ cell tumor (GCT), Ewing sarcoma (ES), retinoblastoma (RB), pleuropulmonary blastoma (PPB) and CNS tumors. HD/NHL – 17 pts., NB – 85 pts., WT – 16 pts., GCT – 8 pts., ES – 26 pts., RB – 3 pts., PPB – 1 pt., CNS – 3 pts. M/F=86/73. Age median – 9.2 y.o. (0.9 – 17) y.o. Conditioning regimens: HD/NHL – CEAM, NB/ES – Treo/Mel, GCT – MAKEI-based with thiotepa (tandem aHSCT), WT – melphalan, PPB – treo/mel, RB/CNS – thiotepa based regimens. Median of CD34+ pos. cells re-infused – 8.3x10^6 /kg (1.9 - 36).

Results: All pts. engrafted. Median day of engraftment – 9 (7-17). At the median follow-up of 13 months (1-23) OS for all groups is 87.3%, EFS – 78.4%. Main cause of death – relapse/progression. TRM was quite low, only 1 pt. died due to therapy toxicity. No relapses were found in the GCT group. Main toxicities: oral mucositis 2-4 gr. was found in 73.2% of pts., febrile neutropenia – 81.7%, enterocolitis 2-4 gr. – 43.5%, toxicoderma 2-4 gr. – 40.8%.

Conclusions: aHSCT in children with malignant disorders is a good option of consolidative therapy. Toxicity and TRM seems to be feasible. Long-term follow-up required.

Stem Cell Transplantation

0074: Role of HDCT with auto-HSCT in the examination of patients with Ewing's sarcoma of the group of unfavorable prognosis

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Keywords: Ewing sarcoma, bone tumor, transplantation

Objective: Ewing sarcoma (ES) is the second most common malignant bone tumor. Despite the complex treatment, progression occurs in 10% of patients, relapse of the disease occurs in 30–40% of patients. High-dose chemotherapy with autologous Stem Cell Transplantation (HDCT with auto-HSCT) can improve survival rates in the group with an unfavorable prognosis. To evaluate the effectiveness of HDCT with auto-HSCT in patients with ES in the group of unfavorable prognosis.

Methods: The study included 28 patients with ES treated at the L.A.Durnov Research Institute from 2018 to 2022. All patients belonged to the group with unfavorable prognosis. 15 patients with HDCT were treated primarily, 7 patients had relapse of the disease, 6 patients had progression of the disease after the first line therapy, with partial or complete response after 2nd and 3rd lines of treatment.

Results: Mean follow-up time was 27.4±17.2 months. The median age was 10 years. Complete response in the first group was achieved in 12/15 cases, with the ongoing remission in 6 cases.

Progression of the disease developed in 6 patients, which led to death in 5 cases. In the relapse group, 7/7 patients achieved the complete response with ongoing remission in 3 cases. Progression or second relapse developed in 5 cases. 5 patients are alive with disease symptoms. In the progression group, complete response was achieved by 3/6 patients, but later 5/6 patients developed progression or relapse. Nowadays 3 patients are alive with disease symptoms. For 17 living patients, the duration of remission was 24.5±17.2 months, median 17.7 months. The median time to progression was 14.3 months.

Conclusions: HDCT with auto-HSCT is potentially able to improve the results of treatment in patients with an unfavorable prognosis. The prognosis in patients with multiple metastasis and progression to the first line of therapy remains extremely unfavorable.

Stem Cell Transplantation

0075: Dermatological toxicity of high doses of thiotepa in children: description of the clinical case

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Keywords: skin complications, transplantation, chemotherapy

Objective: Hematopoietic Stem Cell Transplantation (HSCT) is a treatment option for a number of severe malignant and non-neoplastic diseases. One of the complications of HSCT is skin lesions. The chemotherapeutic agents at the stage of autoHSCT, which most often cause toxic lesions, include: cytarabine, busulfan, treosulfan, etoposide, thiotepa, melphalan.

Methods: Presumably the pathophysiology of toxic damage (eg, skin friction, trauma, temperature gradient), but the main mechanism of development is recognized as toxic damage to the cells of the ducts of the eccrine (sweat) glands and epidermis. Thiotepa is an alkylating agent chemically and pharmacologically related to nitrogen mustard. It is often prescribed as part of conditioning regimens in combination with carboplatin, fludarabine, treosulfan, and other high-dose chemotherapeutic agents. palms, soles and natural skin folds, but skin manifestations occur first in other localizations. The main goals of treatment are topical corticosteroid therapy and patient hygiene (care of the patient).

Results: In our clinic, 2 patients aged 12 months and 6 years with a diagnosis of retinoblastoma were observed, who underwent high-dose chemotherapy in the amount of: Etoposide (3 days), Carboplatin (3 days), Tepadine (3 days) with auto-HSCT. After 65 hours from the introduction of Thiopepa, hyperpigmentation of the chest was noted. In the following days, there was an expansion of skin lesions and an itchy rash in the armpits and inguinal folds, chest and upper neck, upper and lower extremities. Erythematous areas merged into large maculopapular copper-colored plaques with localized skin detachment. These lesions have been associated with Thiotepa. Topical corticosteroid therapy was administered. After 12-15 days, peeling was noted in the areas of erythroderma, which began to disappear. Moisturizing topical therapy was added to the treatment regimen.

Conclusions: Chemo-associated cutaneous toxicity in auto-HSCT is an underestimated but characteristic complication of chemotherapy. Cutaneous toxicity with auto-HSCT is not a reason for the reduction or withdrawal of chemotherapy, or the use of specific treatments.

Stem Cell Transplantation

0076: Autologous transplantation of hematopoietic stem cells in rare malignant neoplasms in children: experience of the N.N. Blokhin

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Keywords: hematopoietic stem cells, chemotherapy, rare diseases

Objective: One of the key stages in the treatment of children with malignant and benign neoplasms is hematopoietic Stem Cell Transplantation (HSCT). In some cases, HSCT is the only and radical method of treatment. HSCT is also used for rare oncological diseases in children. Rare non-malignant diseases in some cases belong to the group of so-called precancerous pathology, which makes the topic relevant for specialists working with malignant neoplasms (MNT) in children. Objective. To present the experience of HSCT in children with rare oncological diseases in children in the N.N. Blokhin NMRCO.

Methods: At the N.N. Blokhin NMRCO for the period 2019 - 2022 aHSCT was performed in 25 patients with rare oncological diseases: retinoblastoma (RB) n=5, germ cell tumor (GCT) n=9, Wilms tumor (V) n=9, sialoblastoma (SB) n=1 and pleuropulmonary blastoma (PPB) n=1. Patients underwent autologous (auto-HSCT). M:W=13:12. Median age 28 months (12-192). All patients underwent pharmacological conditioning. Children with RB, GKO and SB with the inclusion of Etoposide, Thiotepa, Carboplatin and Cyclophosphamide, patients with PPB - Treosulfan and Melphalan, patients with OS with the inclusion of Melphalan. The source of cells in auto-HSCT is peripheral blood (PB)**.**

Results: The patients successfully underwent HSCT. In the early stages after HSCT, complications were noted: toxicoderma of 1-3 degrees, oropharyngeal mucositis of 1-2 degrees, neutropenic enterocolitis of 1-2 degrees. These complications were stopped on the background of standard therapy. Restoration of leukopoiesis in auto-HSCT was recorded on average on the 12th day. No significant toxicity was recorded. 3 deaths were recorded. In a child with RB after 7 months. due to relapse, in 2 patients with OS - bilateral pneumonia, relapse. Median follow-up - 10 months. (2 - 26 months).

Conclusions: HSCT in children with rare oncological diseases is a therapy option with acceptable results. Each patient with a rare oncological and hematological disease requires an individual approach to management during HSCT and subsequent follow-up.

Stem Cell Transplantation

0107: Petrov National Medical Research Center of Oncology experience of tandem-transplantation with stem cell rescue for high-risk neuroblastoma patients

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Keywords: tandem-transplantation, stem cell rescue, high-risk neuroblastoma, myeloablative procedures, high-dose chemotherapy

Objective: Currently, the use of high doses chemotherapy supported by autologous peripheral blood stem cells in consolidation is a necessary therapeutic option in patients with high-risk neuroblastoma. Conditioning regimens and schemes of high-doses chemotherapy (HDC) remain the subject of debate. In recent years, the evidence base of the advantages of tandem myeloablative procedures (HDC1 and HDC2) in comparison with single-transplantation has been actively accumulated in clinical practice. Purpose. To evaluate the toxicity of the tandem-transplantation.

Methods: The study presents experience of tandem-transplantation with stem cell rescue in the Petrov National Medical Research Centre of Oncology (Saint-Petersburg) in four patients with initially stratified high-risk group neuroblastoma. The median age at HDC1 was 5 (interquartile range 2–11) yrs with 100% being male patients. Among the patients half had MYCN amplification. All patients went into HDC1 with a complete response to induction therapy. In all cases, the tumor is located in the retroperitoneal region. All patients were treated with tandem HDC and stem cell rescue. We seek to investigate the toxicity of a planned tandem transplantation with TC

(thiotepa/cyclophosphamide) conditioning and CEM (carboplatin/etoposide/melphalan) conditioning in high-risk neuroblastoma patients.

Results: HDC2 was performed at a median of 30 days after HDC1. A median of 2.82 million CD + 34 cells were infused with HDC1 and 4.7 million CD + 34 cells with HDC2. The median time to neutrophil engraftment was 10 after HDC1 and 12 days after HDC2. During the first 100 days after HDC, there was no death attributed to disease progression. There were no transplant-related deaths in the cohort. The median follow-up was 41 months. Seven serious adverse events occurred in all patients. The proportion of grade 3/4 adverse events was mainly (as expected) blood and gastrointestinal disorders; 2 patients reported grade 1/2 hearing loss.

Conclusions: The single-center prospective study of upfront tandem high-doses chemotherapy with stem cell rescue is clinically useful, proving safe of the option to consolidate remission in high-risk neuroblastoma patients.

Stem Cell Transplantation

0108: Sickle cell anemia beta thalassemia and bone marrow transplantation

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Keywords: sickle cell anemia, beta thalassemia, bone marrow transplantation, hemoglobin electrophoresis, hemosiderin sediment, LDH

Objective: Sickle thalassemia results from the inheritance of beta and S gene and a thalassemia defect on the other beta gene in S beta thalassemia (b0), the thalassemic globin gene produces on

protein so that only beta globin comes from the HBS chromosome. The clinical presentation of HBS B thalassemia is enormously variable, ranging from asymptomatic to a severe disorder. We present a 16 years old patient with high high temperature, severe abdominal pain, at first knee and after ankle joint limbs pains. Expressed pallor, jaundice, hepatosplenomegaly, mild anemia, increased reticulocytes level, hyperbilirubinemia. hypo coagulation. Chest X-ray shows lower lobes consolidation. MRI study of the head and spine show-In the parietal lobe of the left hemisphere, adjacent to the corner coil, hyperintense foci were detected in the white matter and occipital lobe. It should probably correspond to laminar necrosis. Small reperfusion hemorrhagic foci are also not excluded. It should be noted from the anamnesis that, before hospitalization to our clinic the patient was hospitalized twice due to abdominal and lower limbs pain and recurrent infections, moderate anemia was expressed. On the background of symptomatic analgesics and antibiotic therapy condition temporarily improved and discharged home. We made a differential diagnosis between sickle cell anemia and paroxysmal nocturnal hemoglobinuria. We have got an answer hemoglobin electrophoresis – diagnosis was made of sickle cell anemia and beta thalassemia.

Methods: Hemoglobin electrophoresis - It's a test that measures the different types of hemoglobin in the blood. It also looks for abnormal types of hemoglobin. Bone marrow aspiration, with myelogram. Determine hemosiderin sediment in the urine and level of LDH.

Results: By hemoglobin electrophoresis the diagnosis have been - sickle cell anemia, beta thalassemia Excluded Nocturnal paroxysmal hemoglobinuria and other systemic disease.

Conclusions: We have got an answer of hemoglobin electrophoresis a diagnosis was made- sickle cell anemia, beta thalassemia. We started treatment with hydrea 500 mg/day and symptomatic antibiotic therapy, analgesic therapy. Patients' laboratory findings and condition improved and we sent the patient for Bone Marrow transplantation. Bone marrow transplantation was performed from a fully matched unrelated donor, which was successfully implemented. The patient recovered.

Stem Cell Transplantation

0153: Comprehensive rehabilitation in the post-intensive care syndrome after HSCT in a pediatric patient

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Keywords: HSCT, rehabilitation, pediatric cancer, Post-Intensive Care Syndrome

Objective: The outcome of patients admitted to the pediatric intensive care unit (ICU) after hematopoietic Stem Cell Transplantation (HSCT) is generally poor, and mortality can be as high as 37–74%. On average, 25% of intensive care unit survivors develop cognitive, mental, and/or physical impairments, which are now recognized as Post-Intensive Care Syndrome (PICS). Our goal was to assess the functional state of the patient two years after haploHSCT, who has severe complications in the early period and experience in treatment and rehabilitation in the ICU with the development of PICS.

Methods: The patient, a 14-year-old girl with acute T-ALL underwent haploidentical HSCT on February 16, 2021. In the early period, D+20 after HSCT a hepatic coma was diagnosed with severe violations of liver enzymes and a high level of bilirubin (AST-5000 U/L, ALT 8000 U/L, and bilirubin - 585 µmol/L). The patient was on artificial ventilation for 18 days in a coma (Glasgow 7), with signs

of acute renal failure and toxic metabolic encephalopathy. PICS presentation was with neurological consequences: encephalopathy of dysmetabolic and toxic genesis with the development of a syndrome of impaired consciousness to the level of stupor, sensory-motor polyneuropathy, bilateral tibial neuropathy (Grade 3), ECOG-IV. Rehabilitation activities included daily interventions by specialists from a multidisciplinary team for 60 to 90 minutes. The clinical psychologist corrected the emotional status of the patient and optimized the role of parents involved in care and rehabilitation, applied sensory massage and non-verbal communication. The physical therapist used verticalization, passive gymnastics, and stretching. Mechanotherapy was applied in a sitting position using an exoskeleton hand with biofeedback with an ideomotor training program. An ergotherapist, a teacher and a speech specialist additionally worked with the patient.

Results: Functional screening 2 years after HSCT showed the following results. The patient is fully active, ECOG-0, continues his studies at the hospital school in the 9th grade. Regarding physical functioning, the peak oxygen (VO2 max) content during cardiorespiratory testing is 18 ml/kg/min. Assessing cognitive functions, the Stroop test revealed average results of standard values with a 15% increase in result from 2022. Performance metrics for visual orientation and visual perception (LVT) increased by 33%, and the average time spent on correct answers decreased by 1.07 seconds.

Conclusions: Consequences PICS can adversely affect the life and daily activities of the patient, as well as his family. Critically ill patients should be screened for PICS and monitored by a multidisciplinary team that includes an intensive care physician, an oncologist, and rehabilitation specialists. With efforts to prevent PICS by minimizing sedation and early comprehensive rehabilitation during intensive care, a significant improvement in the functioning and quality of life of patients can be achieved.

CNS Tumors and Retinoblastomas

0020: Infant-type hemispheric glioma: new molecular alterations and precision-medicine treatment

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Keywords: infancy, molecular diagnosis, CNS tumor

Objective: Infant-type hemispheric glioma, harboring alterations in the receptor tyrosine kinases ALK, ROS1, NTRK and MET, is a new subtype of Pediatric-type diffuse high-grade gliomas in the 2021 WHO classification of CNS tumors. It has important clinical therapeutic value with specialized therapeutic drugs. Here, we presented 3 cases of infant-type hemispheric glioma. Patient1 with EML4-ALK fusion which often appeared in lung cancer, the other 2 patients have new molecular alterations which has not been reported before (Patient2 has both NTRK1-TP53/TP53-NTRK1 fusions and p53 protein showed characteristic cytoplasm positive; Patient3 presented a brand-new ALK-QKI fusion combined with ALK mutation and focal SMARCB1 deletion. All these 3 cases received corresponding targeted therapy and have a good recovery and normal neurologic function till now.

Methods: Immunohistochemistry. Fluorescent in situ hybridization. Whole-transcriptome sequencing.

Results: Case 1: 8 months, male, right semiovale center occupation. Histopathology: High-grade neuroepithelial neoplasm. IHC: GFAP (only few cells+), Olig2(-), S100(+), CD56(+), Syn(-), NSE(focal+), NeuN(-), CD34(-), INI-1(+), Ki67(10%+). Characteristic Molecular Information: EML4-ALK fusion. Follow-up: 15 months, alive. Case 2: 3 years, female, insular lobe occupation. Histopathology: Gliosarcoma. IHC: GFAP(partly+), Olig2(partly+), Vimentin(+), P53(cytoplasm+), pan-TRK(+), Ki67(25%+). Reticular fiber staining showed biphasic tissue pattern with reticulin-rich

sarcomatous and reticulin-free gliomatous elements. Characteristic Molecular Information: NTRK1-TP53 and TP53-NRTK1 fusion. Follow-up: 27 months, alive. Case 3: 3 years, male, left parietal occipital lobe occupation. Histopathology: GBM and AT/RT. IHC: GFAP(partly+), Olig2(partly+), INI-1(partly-), BRG1(+), SYN(-), CD34(-), BRAF(-), S100(-), CK(-), H3K27M(-), IDH1(-), P53(40%+), ATRX(+), pan-TRK(-), ALK(+), Ki67(30%+). Characteristic Molecular Information: ALK mutation, ALK-QKI fusion, RAD51C mutation and focal SMARCB1(INI-1) deletion. Follow-up: 14 months, alive.

Conclusions: Infant-type hemispheric glioma is a special kind of glioma, which is particularly suitable for precision-medicine treatment approaches. Their overall survival is good compared with other three pHGG subtype.

CNS Tumors and Retinoblastomas

0021: Treating pediatric brain tumors in a resource-limited setting: an experience from Serbia

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Keywords: brain tumor, resource-limited country, survival

Objective: The objective of this study was to assess the characteristics of children with primary brain tumors, the effectiveness of different treatment modalities, and to identify factors associated with the outcome.

Methods: Institute of Oncology and Radiology of Serbia is a national referral cancer center with a long tradition. Every child with a brain tumor that requires radio- and/or chemotherapy is treated

in our institution. A comprehensive analysis was performed on a group of 173 children treated in our Institute in a 10-year period. The examination was based on their clinical, histological, treatment, and follow-up information.

Results: Overall survival probabilities were 68.8% at 2 years, 59.4% at 5 years, and 52.8% at 10 years. Histopathology played a major role in survival, with brainstem glioma and HGG having worse outcomes than embryonal tumors, ependymoma, and LGG (p0001). The degree of resection was also a significant factor in survival, with children who underwent gross total resection having longer survival than those with lesser degrees of resection (p=0.015). The extent of the disease was a critical parameter associated with survival, with patients showing no evidence of disease after surgery having an average survival of 123 months, compared to 82 months for those with local residual disease and 55 months for those with disseminated disease (p0.001). The extent of disease was the only significant risk factor for survival in multivariate analysis (HR 2.06; 95% CI = 1.38–3.07; p0.001).

Conclusions: In a middle-income country setting, achieving adequate outcomes is possible with a well-coordinated and committed multidisciplinary team. The presence of local residual disease following surgery and disseminated disease strongly impairs the survival of children with brain tumors.

CNS Tumors and Retinoblastomas

0063: Feasibility and safety of vincristine, topotecan and carboplatin in children with retinoblastoma – observation from a tertiary cancer center in LMIC

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Keywords: retinoblastoma, chemotherapy, children

Objective: Most widely used systemic chemotherapy regimen for retinoblastoma involves combination of vincristine, etoposide and carboplatin. Etoposide is associated with increased risk of secondary malignancies. Topotecan based regimens have been found to be effective for patients with advanced intraocular retinoblastoma. In our study, we assessed safety and feasibility of vincristine, topotecan and carboplatin (VTC) regimen in children with Retinoblastoma

Methods: We collected data of 30 children (42 eyes) with retinoblastoma, treated with VTC regimen at, tertiary cancer centre in India, between March 2022 and December 2022. The clinical details and toxicities for each patient were noted.

Results: Male and female ratio was 1.7:1. Median age at presentation was 30.5 months (IQR- 12 to 47 months). Positive family history was present in 10% (n=3). Eighteen (60%) of the cases had unilateral disease. Stage0, I, II, III, and IV disease was seen in two(6.67%), seven (23.33%),five (16.67%), six (20%) and ten (33.33%) children respectively. Two (4.8%), six (14.3%), two (4.8%), three (7.1%) and 29 (69%) eyes had group A, B, C, D, and E disease, respectively. Enucleation was

carried out for 56.6% cases (n=17). High risk features on histopathology were present in 47% (n=14) of cases. VTC was given as a second line regimen in 11 (36.7%) children. Children received median number of 3 cycles of VTC (IQR- 1-4). Eleven children abandoned treatment after starting chemotherapy. None of the child with group A, B or C disease required enucleation. Anemia was the most common adverse effect (73.33%, n=22). Other grade 3 or more toxicities were thrombocytopenia (66.67%, n=20), neutropenia (50%, n=15), febrile neutropenia (50%, n=15), enterocolitis (26.67%, n=8), and sepsis (16.67%, n=5).

Conclusions: Topotecan based regimens can be used to eschew etoposide associated secondary malignancies. The toxicities associated with the regimen in our study were mainly due to myelosuppression and manageable in most cases.

CNS Tumors and Retinoblastomas

0064: Trilateral retinoblastoma. Experience of one institution

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Keywords: trilateral retinoblastoma, children, surgery

Objective: Retinoblastoma (RB) is the most common intraocular malignant neoplasm in childhood. About 40% retinoblastomas are hereditary and are caused by mutations in the gene RB1. Children

with hereditary RD are at risk of developing trilateral RB. The aim is to analyze the features of the disease and the results of treatment of patients with trilateral RB.

Methods: 6 patients were analyzed: 3 girls and 3 boys aged from 6 months to 4 years for the period 2020-2022 with trilateral RB. All patients are treated according to the HITMED 2020 protocol.

Results: In 3 patients, pineoblastoma manifested 2-3 years after the end of organ-preserving treatment due to the bilateral presence of retinoblastoma. In 3 cases, trilateral retinoblastoma was initially identified. 2 out of 6 patients didn't undergo surgical treatment of the pineal region: one of them died, and the second patient continues treatment. 1 patient with R1+ resection died from progression of disease and 1 continues treatment. 2 of 4 patients had pineal tumor surgery removed with R0 tumor resection and achieved complete remission. The life expectancy in patients who survived and completed treatment in complete remission is 10 months and 16 months after the end of treatment.

Conclusions: Considering the high incidence of trilateral RB and its high correlation with RB1 mutation, further research should be carried out into the possible investigation of different therapies for the development of pineoblastoma during development with other centers dealing with the treatment of RB diseases.

CNS Tumors and Retinoblastomas

0067: Proton therapy in pediatric recurrent medulloblastoma: an update on hematological toxicity after craniospinal reirradiation

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Keywords: proton therapy , medulloblastoma, toxicity

Objective: Craniospinal reirradiation is limited mostly because of its potential toxicity. Proton therapy may reduce toxicity and may help to apply potentially curative doses. This research was conducted before. We performed the following calculations based on updated patient count.

Methods: Proton beam craniospinal reirradiation course was conducted to 25 patients with recurrent medulloblastoma in one institution. Median dose to craniospinal axis was 30.6 Gy (23.4-36). Twenty three patients had additional local boost to recurrent and metastatic sites. Median dose of primary CSI was 35.2 Gy (23.4-36). Seven patients had reirradiation previously, two of them had craniospinal irradiation with a total dose of 18 Gy.

Results: We analyzed data of 21 patients. Median time between two CSI courses was 30 months (19-126). Median follow-up was 16 months (2-31). Twenty patients received chemotherapy after craniospinal reirradiation. Eight patients had disease progression, for 7 of them it was a cause of death. Chemotherapy-related death occurred in two more patients. During treatment we observed significant reduction in platelet count with minimal values occurring to third week (avg = 97 * 10^9/l; p 0.001) that coincides with completion of the craniospinal part of reirradiation. There

was a non-significant decrease of hemoglobin and neutrophils levels (phemoglobin=0.2, pneutrophiles=0.1). One patient had severe bone marrow hypoplasia during the treatment which required hemotransfusion. The rest of the patients' hematological toxicity still resolved without medical intervention. One half of patients experienced nausea or vomiting during the first treatment week. One patient had radiation necrosis in the boost-area in 9 months after reirradiation.

Conclusions: CSRI is mostly used for patients with refractory disease and leptomeningeal progression. Proton therapy may help to deliver curative doses with limited hematological toxicity and to minimize or completely avoid gastrointestinal toxicity.

CNS Tumors and Retinoblastomas

0130: Delayed diagnosis of pediatric CNS tumors: the unsolved problem in the molecular era

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Keywords: CNS tumors, delayed diagnosis, medulloblastoma, glioma

Objective: Tumors of the Central nervous system (CNS) are the most common solid malignancies in children and adolescents, and the leading cause of cancer-related mortality in this age group. The symptoms of CNS tumors are often non-specific, which frequently leads to delayed diagnosis. The current study aims to evaluate the pattern of delayed diagnosis in a developing country and suggest a universal model for solving the problem.

Methods: We have collected data from pediatric patients (until 18 years) treated in the neurosurgery department, three major chemotherapy clinics, and the radiation therapy department from 1st January 1995 to 31st December 2020 in Armenia. Patients' characteristics, tumor characteristics, and time from first symptoms to diagnosis were calculated using descriptive statistics.

Results: The multicenter data analysis revealed 142 children and adolescents diagnosed with primary CNS tumors over 26 years. Among them 79 (55.63%) were males. The median age at diagnosis was 84 months (range, 3-204 months). Medulloblastomas and other embryonal tumors, low-grade gliomas, and high-grade gliomas accounted for 31.69%, 19%, and 9.15% of all cases, respectively. For 26.79% of cases, histological diagnosis was not available. The mean time from the first symptoms to diagnosis was 5.95 months and the median time was 1 month (range, 0.2-70 months). The mean and median times from the first complaint to the diagnosis of medulloblastomas and other embryonal tumors, low-grade gliomas, and high-grade gliomas accounted for 2.13 months and 1 month (range, 0.2-24 months), 12.5 months and 3 months (range, 0.25-70 months), 1.1 months and 1 month (range, 0.25-3 months), respectively.

Conclusions: Delayed diagnosis of pediatric CNS tumors is a major issue in Armenia. A more pronounced delay in diagnosis was observed in patients with low-grade gliomas. We see the continuous training of primary care physicians and multidisciplinary work as a solution to this major problem.

Bone Tumors

0015: Approach to the treatment of the parosteal metastatic osteosarcoma

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Keywords: sarcoma, low-grade tumor, management

Objective: Osteogenic sarcoma is a widespread bone tumor that occurs in children and adolescents and it accounts for approximately 2.4% - 2.6% of all malignant neoplasms in children. Parostal (juxtacortical) osteosarcoma is a low-grade osteosarcoma that emerges from the periosteum. This tumor is characterized by a high degree of structural differentiation and limited metastatic potential. The parosteal sarcoma accounts for 4% of all osteosarcomas and is commonly localized on the dorsal surface of the distal femur.

Methods: We have observed a clinical case of a patient with osteosarcoma of the femur. According to the revision of histological preparations, parosteal osteosarcoma, Grade 1 (according to the Unni system) of the femur. The operation was performed resection of the femur with replacement of the company's endoprosthesis. The patient was under dynamic observation for 10 months. Our examination revealed lesions in both lungs. The operation was performed: metastasectomy. There was the histological conclusion of metastasis of parosteal osteosarcoma, Grade 2.

Results: Due to the different degree of differentiation of the primary tumor and metastases, the patient was treated according to the EURAMOS protocol branch GR. At this moment the patient is currently in remission. The median follow-up was 26 months. The prognosis for this patient is not determined due to the low incidence of metastatic form of children's parosteal osteosarcoma

and the paucity of literature about the described type of osteosarcoma.

Conclusions: The Periosteal osteosarcomas are mostly low-grade sarcomas and, with the extremely rare «low-grade central» osteosarcomas, are treated exclusively with surgery in the absence of additional factors, such as extensive metastasis or inoperability. At this moment, there is no specific strategy for the treatment of metastatic forms of children's parosteal osteosarcoma. The role of drug therapy is not fully understood, although attempts are being made to provide chemotherapy as an option to treat relapse in these patients.

Bone Tumors

0016: Rare case of metastatic poorly differentiated chordoma

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Keywords: rare tumor, chordoma, SMARCB1/INI1 expression

Objective: Poorly differentiated chordoma (PDC) is a recently described malignant tumor of notochordal origin, usually arising in the axial skeleton, and characterized by loss of SMARCB1/INI1 expression.

Methods: A 10-year-old boy is presented with enlarged cervical lymph node and a shoulder pain lasting for a month. Computed Tomography revealed a tumor formation in the region of C2-C3 vertebrae, anterolisthesis, cervical necrotizing lymphadenopathy, hepatosplenomegaly, enlargement of the mesenteric, retroperitoneal, external iliac lymph nodes. A part of the tumor was removed for decompression. The cervical lymph nodes and pieces of the tumor underwent histological and immunohistochemical examination. Tumor complexes were found in the lymph

nodes and in the interstitial spaces of the bone, hyaline cartilage, and skeletal muscles. Tumor cells were SOX10 -, SALL4 -, Neurofilament -, Vimentin +, AE1/3+, with loss of INI1 expression and the positive nuclear reaction of Brachyury.

Results: The histological picture and immune-phenotype of the tumor cells (INI1-/Brachyury+) was compatible with poorly differentiated chordoma with metastatic lesions of two lymph nodes. The control CT showed the condition after resection of the posterior arches of C1, C2, C3 vertebrae and partial removal of the tumor mass, postoperative changes, a sharp decrease in spinal canal compression, cervical lymphadenopathy, and structural changes. Parents refused further treatment because of a poor prognosis.

Conclusions: Since 2021 PDC has been included in the WHO tumor classification as a separate tumor entity. So far, very few cases of PDC have been described. The differential diagnosis can be challenging, so clinical and radiological findings should always be correlated with histology and immunohistochemistry. The nuclear expression of brachyury and SMARCB1/INI1 loss are very helpful. The proper differential diagnosis is very important, as PDC develops faster and has a worse prognosis, and therefore requires more aggressive therapeutic approaches.

Bone Tumors

0017: Comparison of two protocols in Iranian pediatric patients with osteosarcoma

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Keywords: osteosarcoma, pediatric oncology, chemotherapy

Objective: Osteosarcoma is one of the most common childhood bone malignancies. Although chemotherapy protocol including methotrexate is an effective treatment for osteosarcoma, some other regimens have excluded it because of its complications.

Methods: This retrospective study was conducted on 93 children younger than 15 years old who were diagnosed with osteosarcoma from March 2007 to January 2020. Two chemotherapy protocols were administered for patients, namely, the DCM protocol (Doxorubicin-Cisplatin-Methotrexate) and the German protocol (excluding methotrexate). All statistical analysis was conducted using SPSS-25 software.

Results: Among patients, 47.31% were male. The patient's ages ranged from 3 to 15 with a mean of 10.41 0.32 years. Femur was the most frequent primary tumor site (59.14%), followed by the tibia (22.58%). The metastasis rate at diagnosis was 17.20% in our study. Furthermore, the 5-year overall survival (OS) of total patients was 37.3 7.5%, whereas the 5-year OS of males and females were 33.6 10.9% and 39.8 10.6%, respectively. The 5-year OS of the methotrexate regimen was 15.6 9.6%, whereas that of the methotrexate-free protocol was 50.2 9.0%.

Conclusions: Female patients had better survival rates than males. In addition, the chemotherapy protocol excluding methotrexate significantly increased the overall and event-free survival of patients.

Bone Tumors

0018: Outcomes and prognostic factors of osteosarcoma in children treated on a non high-dose methotrexate based protocol: a single centre experience from India

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Keywords: sarcoma, high-dose methotrexate, prognosis

Objective: Osteosarcoma, the most common malignant bone tumour in children has an overall survival(OS) of around 80% in localised disease in developed countries on a multimodality treatment based on high-dose methotrexate(HDMTX)chemotherapy in majority. However, in resource-limited settings, delivery of HDMTX is challenging. We report outcomes and prognostic factors of osteosarcoma treated on a non-HDMTX based protocol.

Methods: Treatment-naïve children ≤15years with biopsy-proven osteosarcoma from January-2013 to December-2020 were retrospectively analysed. Magnetic Resonance Imaging was used for imaging of primary and staging by bone scan and computed tomography of chest. OGS-2012 chemotherapy protocol, consisting of(3-weekly)4 cycles of Neoadjuvant Chemotherapy (NACT) with cisplatin, ifosfamide,doxorubicin and 4 cycles of adjuvant chemotherapy with ifosfamide and cisplatin was used. Local treatment was planned after NACT as limb salvage surgery wherever feasible. Kaplan-Meier method was used for survival estimates, Cox proportional hazards regression model for prognostic factors.

Results: A total of 508 children were diagnosed with osteosarcoma during the study period, of

which 202 patients (treated outside, upfront palliated due to disseminated disease, defaulted treatment) were excluded. Remaining 306 children were analysed, of which 55(18%) had metastatic disease [lungs-54(unilateral-29, bilateral-25, oligometastatic-38), single bone-1}. Median age was 12 years (range,3-12 years), M:F-ratio-1.7:1, primary site was appendicular skeleton- 293(95.8%), head, neck- 8(2.6%), axial skeleton- 3(1%). Of 271 patients analysable, 149(55%) had >90% histological necrosis. Amputation was performed in 53(18.7%). At a median follow-up of 37 months, 3-year Overall Survival(OS), Event free survival(EFS) of whole cohort were 87.1%(95%CI:82.8%-91.6%), 51.9%(95%CI:47.2%-59.1%) respectively. Three-year EFS for localised,metastatic disease were 57.6%(95%CI:51.4%-64.5%), and 32.1% (95%CI:21.5%-47.8%) respectively (P-0001 Three-year EFS for ≥90% and 90% histological necrosis were 67.3%(95%CI:31.8%-50.6%) and 38.9%(95%CI:31.8%-50.6%) respectively. Serum albumin >3gm/dl was prognostic for OS (P-0.045, HR-0.29,95%CI-0.09-0.974) of whole cohort. Histological necrosis ≥90% were prognostic for EFS of whole cohort (P-0001HR-048595CI-0326-0713 and localised disease (P-0.001, HR-0.43,95%CI-0.27-0.67)

Conclusions: Non high-dose methotrexate based chemotherapy has relatively good outcomes in children with osteosarcoma managed under resource-limited settings. Poor histological necrosis portends worse outcomes.

Bone Tumors

0019: Bone and extraskeletal Ewing's sarcoma. Comparative characteristics of the course and outcomes of the disease. The experience of the Research Institute of Pediatric Oncology and Hematology of N.N. Blokhin National Medical Research Center of Oncology, Ministry of Health of Russia

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Keywords: bone sarcoma, Ewing sarcoma, adolescent and young adult

Objective: Ewing sarcoma is a highly malignant tumor of children and adolescents which affects bones and soft tissues. Differential diagnosis is complex and requires the full range of immunohistochemical and molecular genetic studies. The prognostic significance of having extraskeletal (EES) versus skeletal Ewing sarcoma (ES) in the setting of modern chemotherapy protocols is unknown and requires additional analysis Aim: to conduct a comparative analysis of the survival of patients with ES and EES, using the same approaches to treatment.

Methods: The study included 330 patients with a confirmed diagnosis of Ewing sarcoma who received treatment from 2008 to 2022. Majority (84.85%) of patients had bone tumor, a minority (15, 15%) of patients had soft tissue tumors. The comparative analysis of indicators was carried out (from 0.5 to 230 months, median 35.5 months). All patients received treatment according to the protocols carried out at the Research Institute: MMSU 99, ES-2017. Data

collection ended November 30, 2022.

Results: The average follow-up time in all patients was 48.6±38.4, with ES - 50.1±39.6, EES - 40.3±29.1. The 5-year survival rates of localized forms of ES and EES was the same (79% and 78.5%, respectively, p = 0,000001). The 5-year overall survival (OS) was 41.2% and 40.6% with median OS 46.9 and 28.4 months, respectively. The 5-year progression–free survival (PFS) for EES was higher in cases of local stages - 71.6% versus 75,6% (p=0,00001), same for disseminated stages – 32,4% versus 44.9% (p=0,036). The timing of relapse in patients with disseminated forms of ES and EES was the same: 20 and 21.1 months respectively.

Conclusions: OS and PFS in patients with ES and EES were different. An additional analysis of the genomic characteristics of the two groups is needed to identify unfavorable prognostic factors and change approaches to therapy.

Bone Tumors

0131: Primary resistance of Ewing sarcoma cells to chemotherapy and ways to overcome its resistance

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Keyword: Primary resistance, Ewing sarcoma, chemotherapy

Objective: The treatment of Ewing sarcoma (ES) is currently an urgent and little-studied problem due to the biological characteristics of the tumor. One of the main drugs in the treatment is doxorubicin, which acted with the inhibition of topoisomerase II, integration into DNA and the formation of DOX-DNA adducts, which leads to the activation of apoptosis in cells and changes in the tumor microenvironment. The phenomenon of DOX-induced aging of tumor cells is described, which leads to resistance during chemoradiotherapy and a high risk of metastasis.

Methods: On the basis of the L.A. Durnov Research Institute, I.M. Sechenov Moscow State Medical University, Tomsk NMIC RAS, the analysis of biopsy material of recurrent tumors of 40 patients with ES was carried out. Changes in the expression of the MGST1 and COL6A2 genes in response to the action of doxorubicin were detected in all samples.

Results: COL6A2 encodes one of the three alpha chains of type VI collagen, and is associated with migration, invasion, metastasis of the tumor, and positively correlates with most immune cells in the tumor microenvironment. The protein of the MGST1 gene protects membranes from oxidative stress, catalyzes the conjugation of glutathione with electrophiles and is responsible for the restoration of lipid hydroperoxides. In ES cells, the expression of this protein is associated with the sensitivity of cells to doxorubicin.

Conclusions: ES in all patients has the same mechanism of occurrence, but each tumor has its own clonal heterogeneity and microenvironment that determine the disease's refractoriness, susceptibility to chemotherapy, and the likelihood of recurrence. Drug resistance of tumor cells to doxorubicin may be primary or acquired. Resistance of any type to drugs can be an irreversible phenomenon, and is associated with the expression of the MGST1 and COL6A2 genes, which is an unfavorable prognostic factor and requires a change in the approach to therapy.

Renal Tumors

0022: Outcome of unilateral anaplastic Wilms tumor in pediatric: single institute experience, Children Cancer Hospital Egypt, 57357

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Keywords: Wilms tumor, anaplastic histology, pediatric population

Objective: Wilms Tumor (WT) also called Nephroblastoma is a malignant renal embryonal tumor and accounts for 5% of childhood cancers. WT comprises three histological components namely blastemal, epithelial and stromal. The histological feature of clinical significance is anaplasia (focal or diffuse). Anaplasia is a potent marker of adverse prognosis with increased resistance to chemotherapy. We aim to assess the impact of different prognostic factors (age, stage, focal and diffuse anaplasia) on the outcome of anaplastic WT also analyzing chemotherapy related toxicity.

Methods: A retrospective study including all pediatric patients diagnosed with anaplastic WT treated at Children's Cancer Hospital Egypt, 57357 (CCHE), from July 2007 to September 2017. Patients were treated according to modified Children's Oncology Group (COG) protocol (AREN0321).

Results: Sixty three patients (median age, 4.5 years; range, 9 months to 12.5 years) were eligible with slight male predominance 54% (n= 34 patients). Twenty patients had metastatic disease, nineteen patients had pulmonary metastasis and one had pulmonary and hepatic metastases). Out of the 63 patients 12 had focal anaplasia (19%) and 51 had diffuse anaplasia (81%). Among the entire cohort, stage III disease accounts for 47.6% followed by stage IV (31.7%). Eighteen patients

underwent upfront nephrectomy while the remaining 45 patients received neoadjuvant chemotherapy. All patients received radiotherapy. The 5- year overall survival and event-free survival were 70.7% and 68.1% respectively. Age and stage had no significant impact on outcome. Twelve patients out of the 13 relapsed patients had diffuse anaplasia. Only 3 patients died out of treatment-related mortality.

Conclusion: Anaplastic histology is an important histologic predictor of response and survival in patients with WT. Tumors with diffuse anaplasia confer a poorer prognosis, thus more efforts to improve the outcome are required.

Renal Tumors

0040: Treatment of nephroblastoma in children in the conditions of the children's department

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Keywords: Nephroblastoma, solid tumor, chemotherapy

Objective: Nephroblastoma is a highly malignant solid tumor of the kidney. Nephroblastoma is most common in children under 5 years of age, more common in boys. In Tajikistan nephroblastoma takes 4 th place. The thesis provides statistical data on the results of treatment with nephroblastoma for 2021-2022 years in the children department according to the SIOP protocol.

Methods: Twenty five children have been watched with diagnosis nephroblastoma at the children's department for the last 2-years, there 9- girls and 16-boys among them. The

children were divided according to their age in the following way: 5-patients till 1years, 8-patients from 1 to 3 years, 11-patients from 3 to 4 years, 1 patient of 5 years. By the localization of tumor: 14 patients had the affection of the left kidney, 9-patients had the affection of the right kidney, 2-patients had bilateral affection. 5 patients were taken to the department having the 2 d stage, 15 patients had the 3 d stage, 3 patients had the 4 th stage. 2 patients had bilateral affection.

Results: Two patients (1 month, 5 month) were operated without chemotherapy (according the protocol), the parents of 3-patients refused the treatment, 1 patient with mts lesions of the brain and lungs chemotherapy was given with palliative goal, 3-patients are getting adjuvant chemotherapy by the AV scheme, 16 patients were given chemotherapy in non- adjuvant regime by the scheme AVD+ nephrectomy + chemotherapy in adjuvant regime.

Conclusions: The modern methods of treatment of nephroblastoma have been introduced into the children's department since 2021, which corresponds to the world standards. In further times we are planning to compare analyses of the results of treatment of nephroblastoma in children before introducing and after.

Renal Tumors

0090: Outcome and clinical significance of next generation sequencing (NGS) in Chinese patients with relapsed/refractory (r/r) Wilms tumor

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Keywords: Wilms tumor, relapse, next generation sequencing

Objective: Medical advances have been greatly improved in the survival rate for Wilms' tumor (WT), but the survival is still dismal for relapsed/refractory (R/R) patients.

Methods: From Mar, 2016 to May, 2020, tumor specimens and matched blood samples were collected to performed next-generation sequencing (NGS) using a 539 cancer-related gene panel in a CAP-certified laboratory (Simcere Diagnostic Co, Ltd) to investigated the genomic profiling and the incidence of germline cancer susceptibility mutations of Chinese patients with R/R WT in Sun Yat-Sen University Cancer Center. Clinical data were also included in the analysis.

Results: Twenty patients were enrolled, including 12 females, with median follow-up time of 46.2 months (16.3-148.8 months). At the last follow up, ten patients died, with median PFS time of 8.0

months (3.2-43.9 months). The 5-year OS rate was 29.5±15.8%. Types of pathology include: 5 mixed types, 1 mesenchymal type, 3 blastemal predominant type, 2 epithelial type, and 9 unclassified types. The TOP 5 genes of the somatic mutations include: CTNNB1 (30%), CDKN1B (10%), ARID1B (5%), ASXL1 (5%), and BRIP1 (5%). The main signaling pathways involved include: Genomic instability pathway, cell-cycle pathway, RTK-signaling pathway, PI3K/ALK pathway, and so on. Three of 14 patients (21.4%) had pathogenic germline mutations, including WT1 (n=1) and FANCA mutations (n=2). The median TMB was 1.42 Muts/Mb (0-9.22 Muts/Mb). Six of 20 patients (30%) of patients were matched with targeted drugs. One patient with a tumor recurred 6 times was found to have CDK4 gene amplification, and benefit from CDK4 inhibitors for achieving disease stability for 4 months.

Conclusions: This study plotted the mutation map of R/R WT and found that the proportion of patients with pathogenic germline mutations is high, Although the prognosis of R/R WT is poor, 30% of patients could be matched to targeted drugs and maybe benefit from targeted therapy.

Renal Tumors

0150: Long-term results of treatment of children with Wilms tumor

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Keywords: Wilms' tumor, chemotherapy, SIOP WT-2001, 2018 SIOP RTSG

Objective: Wilms' tumor (WT) is a highly sensitive tumor to chemotherapy and radiation therapy. The histological characteristics of the tumor and stage of the process have the greatest prognostic

significance. Treatment of WT can be considered as a paradigm of multimodal treatment of malignant solid tumors in childhood.

Methods: Since 2012, in the treatment of WT, we have used the schemes of the SIOP WT-2001 and 2018 SIOP RTSG. A total of 59 patients were treated (33 boys, 26 girls). The age of the children ranged from 6 months up to 16 years old. The average age was 3 years 5 months. In 4 (6.8%) children, stage I of the disease was noted, and stages II, III, IV were observed in 22 (37.3%), 19 (32.2%) and 14 (23.7%) patients, respectively. Thus, 55.9% of patients had III and IV stages of the disease. After 4-6 weeks of chemotherapy (vincristine, dactinomycin, adriamycin), all patients underwent nephrectomy. After a morphological study, risk groups were identified: low risk was found in 4 (6.8%) patients, standard risk in 34 (57.6%) and high-risk in 21 (35.6%) patients. Postoperative chemotherapy was carried out according to the protocol.

Results: The overall cumulative 5-year overall and event-free survival rates for all children were 87%±5% and 84%±5%, respectively. It should be added that 33 out of 59 patients had stages III-IV of the disease, and 21 patients had a high-risk group. Interestingly, according to our data, the results of treatment of WT on the right side are better than on the left side (96%±7%, 76%±7% respectively).

Conclusions: Thus, the programs SIOP WT-2001, SIOP RTSG are effective in the treatment of WT. It should be added that these results were obtained in the group of patients where stage III and IV of the disease predominated. It is necessary to carry out measures for the early diagnosis of kidney tumors in children in the republic.

Germ Cell Tumors

0026: Results of treatment of malignant ovarian tumors (MOT) in children in the Republic of Tajikistan

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Keywords: Ovarian tumors, children, chemotherapy, Tajikistan

Objective: Malignant ovarian tumors (MOTs) in children and adolescents are rare compared to adults, but are the most common tumor of the genital organs, accounting for 60–70% of all gynecological malignancies in this age group. The incidence of ovarian tumors in childhood is 2.6 cases per 100,000 girls per year, 50% of them are malignant neoplasms; 85% are germ cell tumors, 8% are epithelial cell carcinoma, and 5% are sex stromal cord tumors. Most researchers report that stages I and II of MOT are most often detected in children, stages III and IV are somewhat less common. Until 1970, cyclophosphamide was widely used in the treatment of malignant ovarian tumors. As a rule, malignant tumors had a poor prognosis and high mortality due to the lack of postoperative intensive care and doctors; doubts about the use of cytotoxic drugs in infants and young children. After 1971, cisplatin began to be actively introduced into practice, and showed its effectiveness in MOT. From that time to the present, surgery + chemotherapy according to the BEP protocol has been the standard protocol in the treatment of ovarian germ cell tumors. The introduction of adjuvant platinum-based chemotherapy after cytoreductive surgery significantly improved the prognosis of MOT in children and adolescents, and also allowed more frequent organ- sparing operations, overall recurrence-free survival increased to 95% according to a number of studies. Our aim is to study the results of treatment of MOT in children according to

the data of the State Institution of the Ministry of Health and Social Protection of the Republic of Tajikistan.

Methods: The results of treatment of 49 cases of MOT in children in the pediatric oncology department of theState Institution "Republican Cancer Research Center" of the Ministry of Health and Social Protection of the Republic of Tajikistan for 2005-2020, aged 1-17 years, are presented. Children from the 1st group (n=31) received surgical treatment at the first stage followed by adjuvant chemotherapy (ACT), patients of the 2nd group (n=18) at the preoperative stage underwent non-adjuvant chemotherapy (NAC) according to the "EP" and "CAP" schemes.

Results: Most of the patients had II and III stages of the disease - 33 (68%) and 7 (14%), respectively, only 57% of children were hospitalized in a specialized institution within 1 month from the onset of symptoms of the disease, and 88% had an average severity of the general condition associated with complications of the underlying process. There were also errors in the tactics of surgical treatment in non-core institutions in 12% of cases, and a third of patients (35%) violated the regimen or refused drug therapy. At the end of the study, 84% of children from group 1 and 94% from group 2 were alive and in remission. Indicators of 3-year dynamic survival, depending on the treatment protocol, did not have a significant difference, and 5-year overall survival was 12% higher in the group who received NAC. 6 dead patients initially had III-IV stages of the disease, did not receive NAC, and 4 of them had continued tumor growth against the background of ACT. The fate of 5 children is not known.

Conclusion: Unsatisfactory survival rates of patients require measures to increase the oncological vigilance of primary care physicians, pediatricians, general surgeons to increase the proportion of patients with early stages of the disease, which will improve treatment outcomes, improve survival and quality of life for this category of patients.

Germ Cell Tumors

0027: The role of p53 gene suppressor and BCL - 2 oncoprotein in germ cell ovarian tumor prognosis determination among child and adolescent patients

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Keywords: germ cell tumor, BCL-2 oncoprotein, p53 gene suppressor

Objective: To determine the p53 gene suppressor and bcl-2 oncoprotein forecast role in germ cell ovarian tumor prognosis among child and adolescent patients.

Methods: Our research is based on immunohistochemical method results of 35 patients with germ cell ovarian tumors at I-IV stages, which were diagnosed and treated in children oncology departments.

Results: The analysis of immunohistochemical method results shows 7(20%) patients among which had been marked high expression bcl-2 oncoprotein, 11(31,4%) moderate express, 16(45,7%) low express. Analysis of p53 gene suppressor results shows 9(25,7%) patients among which had been marked high expression, 11(31,4%) moderate express, 15(42,8%) low express. The high correlation between bcl-2 expression level increases and fast tumor growth, and therefore incurability of the oncologic process among patients had been revealed. Also the high probability of tumor recurrence was noticed. In the high-positive p53 gene suppressor rate group, aggressive current of tumor process took place and these patients had early recurrence and metastases,

which demanded recurrent aggressive chemotherapy.

Conclusions: p53 gene suppressor and bcl-2 oncoprotein expression in germ cell ovarian tumors among the child and adolescent patients is characterized with high and low rates, which enables use of this rate determination for given pathology currency prognosis identification.

Germ Cell Tumors

0034: Circulating micro-RNAs in diagnosis of children with germ cell tumors

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Keywords: germ cell tumor, circulating microRNA, children

Objective: Serum microRNAs reveal great potential for detecting germ cell tumors (GCT). Majority of the studies focus on testicular GCT. We would like to share our experience in studying the diagnostic value of circulating microRNAs in children with gonadal and extragonadal GCT.

Methods: We retrospectively analyzed the expression of 9 microRNAs (microRNA clusters 302/367 and 371-373, miR375) in the blood serum of 20 children with GCT and 7 with non-oncological pathology by PCR. miR39-3p and miR451a were used as exogenous and hemolysis control.

Results: The main group patients were divided into 2 groups: teratomas (n=5) and malignant GCT (n=15). Patients with histological verification of teratoma and an initially high level of AFP were regarded as malignant teratomas. Non-oncology pathology included lipoma of various localization, testicular/ovarian cyst, soft tissue cyst. In patients with malignant GCT overexpression of miR302d (RQ=55.003, p=1.5966216E-5), miR367 (RQ=515.441, p=1.722756E-7), miR371(RQ=252.355,

p=8.228475E-6), miR372 (RQ=124.152, p=8.5745196E-5), miR373 (RQ=256.513, p=2.232953E-6) was detected. Statistically significant data were also obtained for miR302b (RQ=7.885, p=0.003) and 302c (RQ=5.281, p=0.013), but their median expression is much lower. The expression of miR375-3p was insignificant and statistically unreliable (RQ=1.838, p=0.253). In the teratomas group, the median RQ for each microRNA was 3.0 and results were unsignificant. In ROC analysis the sensitivity and specificity were the highest in miRs 367 (AUC=0.97, 95% CI: 0.90-1.0), 371 (AUC=0.85, 95% CI: 0.68-1.0), 372 (AUC=0.86, 95% CI: 0.70-1.0), 373 (AUC=0.90, 95% CI: 0.76-1.0) and 302d (AUC=0.86, 95% CI: 0.70-1.0) (p0001 The lowest AUC was determined for miR375-3p (AUC=0.49, 95% CI: 0.18-0.80).

Conclusions: Overexpression of miRs 302/367, 371-373 is characteristic of malignant GCT. Taking into consideration the high sensitivity and specificity, serum miRs 367,371,372,373,302d are of great interest for clinical use in malignant GCT. Significant expression of miR 375-3p was not detected either in malignant GCT or in teratomas.

Germ Cell Tumors

0092: Germ cell tumor in children; a three-year-experience of pediatric hematology/oncology center, medical city

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Keywords: germ cell tumor, yolk sac tumor, Pediatric Hematology - Oncology center

Objective: Gonadal and extragonadal germ cell tumors are very infrequent in childhood, occurring at a rate of 2.4 cases per million children and representing approximately 2% to 3% of cancers diagnosed in children and adolescents younger than 15 years. Aim of study: To describe clinical, histological and pathological characteristics in children with germ cell tumors and assess their outcome.

Methods: A retrospective study for children with germ cell tumor who were treated at the Pediatric Hematology - Oncology center /Medical City for three years from January 1st 2016 till December 31st 2018 and their follow up till June 30th 2021. Thirty-four cases were identified. The total information was collected by using data from the medical record at our oncology registry and from registered archives in outpatient records. Follow up of patients over an average period of more than three years was carried out either in person at the outpatient clinic or by phone call. Statistical package for social science version was 23.

Results: The initial age of presentation ranged from birth until 14 years. More than sixty percent presented below four years' age and then after this, the age at diagnosis was approximately equally distributed in both 5-9 years & 10-14 years; 6 and 5 patients (17.6% & 14.7% respectively). Females predominate in all age groups (76.5%) Vs (23.5%) male with male to female ratio of 0.5: 1. The main presenting symptoms were fever in 13 patients (38.3%). There were 11 patients (32.4%) who had testicular swelling, and 11 patients (32.4%) with abdominal distension. The duration of symptoms is more than 6 weeks in 19 cases (55.9%). The common histological type is yolk sac tumor in 18 patients (52.9%). No patients presented with stage I, 9 patients with stage II, 6 patients (17.7%) with stage III and 9 patients (26.5%) with stage IV. The duration of symptoms is more than 6 weeks in 19 cases (55.9%). There were four benign cases.

Conclusions: The delayed diagnosis is one of the main obstacles in the management of this group. Risk assessment and staging was not conclusive in some cases due to the gaps between surgeons and oncologist. The upstaging gives better outcome in overall survival compares to other study at the same place.

Germ Cell Tumors

0125: A case report of yolk sac tumor of vagina

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Keyword: case report, yolk sac, vagina

Objective: Malignant germ cell tumors (GCTs) arising from the vagina are rare, comprising 3% of all GCT cases. Yolk sac tumor (YST) is the most common in the pediatric population and is mostly found in children less than 3 years old.

Methods: This is a case report, of a 1-year-old female diagnosed with YST.

Results: Parents of a 1-year-old female child noticed vaginal bleeding and the child was examined by a gynecologist. MRI examination revealed a multidimensional mass of 33x28x52 mm. CT scan revealed a tumor in the vagina with no signs of secondary infection, no visible inguinal lymph nodes, no ovary changes, and no adjacent enlarged lymph nodes were found. She was sent to the YSMU Muratsan Chemotherapy Clinic for further diagnosis and treatment. Under general anesthesia and sonographic control, a thin needle biopsy of the vagina was performed. A biopsy histological examination diagnosed embryonal rhabdomyosarcoma. However, an immunohistochemical examination confirmed the diagnosis of YST. AFP level was 3859 ng/ml. The treatment was based on the PEB regimen. AFP came down to 10.51 ng/ml, and control MRI showed no evidence of active tumor. Considering the good response to the treatment and

decreased AFP level, it was decided to close follow-up. The child is in complete remission for 4 years.

Conclusions: Surgical treatment in combination with chemotherapy is a cornerstone of the treatment of GCTs. Despite that fact, surgical options in the case of vagina can be mutilating affecting fertility. The reported case shows the option of avoiding radical surgical treatment and close follow-up.

Liver Tumors

0035: Hepatoblastoma: atypical findings of "typical" tumor

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Keywords: hepatoblastoma, AFP, atypical manifestations

Objective: Hepatoblastoma is the most common malignant liver tumor in children under the age of 4 years. Hepatoblastoma in most cases is represented by liver lesions with greatly elevated AFP. Patients with mild AFP elevations usually have poor prognosis. Below is a case of hepatoblastoma with atypical visualisation patterns and low AFP level.

Methods: A 2-year-old boy presented with abdominal pain for the past 2 weeks. AFP was 39,49 ME/ml. Abdominal CT revealed hyperdense lesion in S4 hyperattenuating in arterial phase with washout in portal phase. MRI shows hyperintensity on T2WI liver lesion with central hyperintense zone. Lesion has active enhancement in arterial phase with washout in portal phase and enhancement in hepatospecific phase. Visualization patterns were not typical for hepatoblastoma. AFP increases from 39.49 ME/ml to 61.09 ME/ml in 7 days. Due to atypical visualization and

increasing AFP level, the patient underwent surgery.

Results: According to immunohistochemical study this tumor corresponded to a pure fetal variant of hepatoblastoma. Patients with this histological variant have good prognosis.

Conclusions: Despite a large arsenal of modern methods for diagnosing liver tumors, well known manifestations of hepatoblastoma, sometimes there are patients with atypical manifestations. Only close work of an oncologist, radiologist and pathologist allows the correct diagnosis.

Liver Tumors

0122: Impact of COVID-19 on management of children with hepatoblastoma (HB) in developing world, Pakistan

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Keyword: COVID-19, hepatoblastoma (HB), developing world, Pakistan

Objective: COVID-19 pandemic had grave consequences on healthcare delivery systems particularly in low middle income countries (LMIC) ; its detrimental effects on the management of pediatric cancers were striking. The main objective of this study is to determine the impact of COVID-19 on clinical presentation, management and outcome of children with hepatoblastoma as compared to pre COVID period at our institute.

Methods: This retrospective cohort study was conducted at the pediatric hematology oncology department by selecting Group-A from pre COVID 2 year period 2017-2018 and Group-B during COVID pandemic in Pakistan year 2020 & 2021. All children diagnosed as HB during these 4 years were included .Clinical data was collected from record and analyzed by comparing both groups by applying t- test using SPSS version 20.

Results: In group-A, 24 and in group-B 29 children with HB were enrolled. Males were dominant in both groups i.e. 16 (66%) and 23 (79%) in A & B respectively. Mean age was 21 months group A and 22 months in group B. In group-A 14 (58%) had pretext-II & 8 % pretext III unifocal disease, 2 (8%) with vascular invasion and one child with extra hepatic disease without any pulmonary metastasis .On the contrary group –B had 9 (31%) with pulmonary metastasis, 11 (38%) with vascular invasion, 11 (38%) & 5(17%) pretext II & III and 8 (28%) pretext IV multifocal disease. Treatment was abandoned by 10(41%) and 13 (44%) in group A & B respectively. Neoadjuvant chemotherapy was given to 13 (54%) in group A and 20 (68%) in group B but surgery was done in 12 (50%) in group A and in group B, 9 (31%) had surgery while 8 (28%) had still unresectable disease with 29% mortality in A and 20% in group B and relapse in 2 children in both groups. Two year survival rate was 37% with and 64% without abandonment in group A with mean follow up of 30 months while in group B 24% with and 43% without abandonment with mean follow up of 26 months.

Conclusions: COVID-19 had significant impact on our children with HB leading to more advance and aggressive presentation with metastatic disease posing them to dismal prognosis mainly owing to their unresectable disease and lack of liver transplant facility at the center.

Rare Tumors and Histiocytic Disorders

0029: Approaches to molecular genetic diagnosis and MRD assessment in Langerhans cell histiocytosis (LCH) patients

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Keywords: Langerhans cell histiocytosis, BRAF V600E mutation, molecular genetic testing

Objective: Somatic BRAF V600E mutation is detected in 60% of patients with LCH. BRAF V600E allelic load monitoring in ccfDNA at therapy timepoints was proposed to monitor MRD. Besides that, assessment of the allelic load in myeloid progenitors population (CD34+CD117+) can serve as a promising biomarker of disease activity and therapeutic efficacy. In addition to the BRAF V600E mutation, other mutations in the MAPK/ERK pathway can cause LCH.

Methods: Sanger sequencing (152 patients) and ddPCR (ccfDNA – 117/152 patients, bone marrow myeloid progenitors – 62/152) were used to detect the BRAF V600E mutation. In case BRAF V600E was confirmed, its allelic load was monitored at six therapy timepoints (in 21 patients) using ddPCR. For BRAF-negative patients, NGS of FFPE LCH tissue was performed using a customized targeted gene panel.

Results: BRAF V600E was determined among 17% (5/29) patients with single system disease (SS), 42% (28/66) - with multisystem disease without risk organ involvement (MS RO-), 77% (44/57) - with risk organ involvement (MS RO+). In ccfDNA 10% (2/20) SS, 44% (20/45) MS RO- and 79%

(41/52) MS RO+ patients had BRAF V600E. For 62 patients, BRAF V600E was determined in the myeloid progenitors: SS – 0% (0/4), MS RO- – 22% (5/23), MS RO+ – 60% (21/35). Monitoring of the allelic load in ccfDNA and myeloid progenitors showed a dramatic decrease in all patients on therapy. Among BRAF-negative patients, other alterations were determined: 14 BRAF exon12 in-frame deletions, 14 MAP2K1 alterations, 3 low-level BRAF V600E, 1 BRAF V600A, 2 KRAS, 1 HRAS, 1 NRAS variants. In 12 patients, no significant genetic variants were identified.

Conclusions: BRAF V600E mutation in ccfDNA and in myeloid progenitors is associated with a more severe clinical presentation. A decrease in the allelic load of the mutation reflects the therapeutic response. Analysis of clinicogenomic associations will expand the understanding of LCH biology.

Rare Tumors and Histiocytic Disorders

0050: A retrospective study of 5 pediatric patients with BCOR rearrangement sarcoma

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Keywords:Sarcoma, Ewing sarcoma, children

Objective: BCOR rearrangement sarcoma is a subtype of "Ewing like" tumor with morphological and immunohistochemical similarities to classical Ewing sarcoma (ES) but without EWSR1-ETS fusion. Recent studies reported that its BCOR genetic alterations include BCOR-CCNB3, BCOR-MAML3, ZC3H7B-BCOR, BCOR-CIITA, KMT2D-BCOR and BCOR-CHD9 fusion. BCOR, SATB2, CyclinD1

and Vimentin are often expressed in immunohistochemistry of BCOR rearrangement sarcoma. The aim of the present study was to further investigate the clinicopathological features, diagnosis and treatment results of BCOR rearrangement sarcoma in children.

Methods: We retrospectively analyzed five cases of BCOR rearrangement sarcoma aged under 18 years diagnosed between 2020 and 2022 in Sun Yat-sen University Cancer Center, China. The clinical, histologic, immunohistochemical and molecular features were reviewed.

Results: All 5 cases occurred in boys with a median age of 11 (range, 4- 16) years. The primary site was in the kidney (2 cases), left upper tibia (1 case), left ankle (1 case), and left lower leg (1 case). The immunohistochemical characteristics were that when BCOR/SATB2/CyclinD1/Vimentin was fully expressed, the expression of CD99 was between negative and weakly positive. In 3 cases, the positive rate of Ki-67 expression was more than 40%. Interphase FISH or RNA sequencing was performed to show BCOR-CCNB3 fusion (4 cases) and BCOR-CHD9 fusion (1 case). All cases were treated similarly to the Ewing sarcoma. 3 cases had finished treatment, 2 patients got CR and 1 got SD. Other 2 cases are still under treatment, and both patients have obtained CR.

Conclusions: Given the small size sample,we revealed that BCOR rearrangement sarcoma in children is very sensitive to the treatment of Ewing sarcoma and has a good prognosis. A larger sample of clinical research is needed.

Rare Tumors and Histiocytic Disorders

0051: The case of successful use of pegylated liposomal doxorubicin in a patient with refractory course of desmoid fibromatosis

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Keywords: desmoid fibromatosis, chemotherapy, children

Objective: Desmoid fibromatosis (DF) is a rare mesenchymal tumor developed from musculoaponeurotic structures. It's characterized by a locally aggressive growth and a high recurrence rate without metastatic potential. Most DF are solid, painless, slow-growing tumors of a shoulder, hip, or extremities. An initial "wait and see" approach is reasonable for many patients. When symptoms appear or in the case of functional impairment risk, therapy should be given/prescribed. None of the available treatment options has significant advantages. However, the response observed with the application of pegylated liposomal doxorubicin (PLD) is more convincing.

Methods: Here we report the case of using PLD in a boy with DF. At the age of 1.5 after intramuscular injections a seal in the right gluteal region was noticed. According to primary MRI a 5.9x3.5x6.0 cm tumor was found in the projection of the right gluteal and piriformis muscles. Partial resection was performed, DF was histologically verified. Patient had undergone chemohormonal therapy (methotrexate, vinblastine, tamoxifen) for 6 years, but the tumor continued to grow.

Results: At the age of 8 the patient had 13.6 x 8.2 x 8.6 cm tumor, mobility limitations, gait and posture disorders. Radical resection was performed, but tumor relapsed in a year. Further therapy options (metronome therapy, tyrosine kinase inhibitors, radiation therapy) within 3 years were also unsuccessful (26.6x14x12 cm tumor, volume 2385.4 cm3), and pain syndrome appeared. Patients received PLD 35-40 mg/m2 every 4 weeks, a total of 10 courses. There was a good response by an 18% decrease in tumor size after the end of the course, and further 10% decrease in 3 months.

Conclusions: The presented case demonstrates the effectiveness of PLD in a patient with DF. It seems relevant to conduct further studies of the use of PLD in patients with DF.

Rare Tumors and Histiocytic Disorders

0052: Non-inflammatory myofibroblastic tumors NTRK rearrangement-related tumors in children and adolescents: clinical, pathologic, and molecular features

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Keyword: NTRK tumors, children, rare tumors

Objective: Neurotrophic tyrosine receptor kinase (NTRK) fusions have been described as oncogenic drivers in a variety of tumors. At present, there have been a large number of clinical

studies on infantile fibrosarcoma reporting its disease characteristics and prognosis, but there are very few reports on the clinical characteristics and correlation of other solid tumors related to NTRK. In this study, the clinical, pathological and molecular characteristics of NTRK rearrangement-related tumors were collected from multiple centers in China and analyzed.

Methods: From July 2018 to March 2023, we collected clinical information on 19 NTRK-rearranged tumors and performed tumor genome analysis on tissue samples from 8 of them using custom-designed DNA and RNA next-generation sequencing panels.

Results: The 19 NTRK-rearranged-associated tumors were diagnosed as 15 NTRK-rearranged spindle cell tumors, 1 Wilms tumor, 1 teratoma, 1 inflammatory myofibroblastic tumor, and 1 salivary gland carcinoma. The types of NTRK rearrangement included 7 cases of LMNA-NTRK1, 7 cases of TPM3-NTRK1, 1 case of ETV6-NTRK3, 1 case of SH3BP1-NTRK1, 1 case of SLC6A15-NTRK3, and 2 cases of NTRK fragmentation detected by FISH but the specific fusion type was unknown. All patients underwent surgery to remove the primary tumor, 6 patients received postoperative chemotherapy, and 2 patients received radiotherapy. Six of these patients experienced tumor recurrence after treatment. 10 patients entered the clinical trial of targeted therapy after surgery or recurrence, of which 6 were treated with larotrectinib, 2 were treated with entrectinib, and 2 were treated with ICP-723. As of the last follow-up, the two patients who died experienced PR after enrollment in the clinical trial of larotrectinib, and PD after 9 months and 22 months, respectively. The remaining patients are currently alive, with a median follow-up of 23.8 months.

Conclusions: In addition to infantile fibrosarcoma, NTRK gene rearrangements have been detected in a variety of tumors in children and adolescents. Most of these tumors are rare tumors, and the main treatment is surgery, which is not sensitive to chemotherapy and radiotherapy. In recent years, clinical research on targeted therapy has a very definite curative effect on this type of tumor, which has greatly improved the survival of this type of tumor. Next-generation sequencing testing involving NTRK gene fusions is recommended routinely in childhood and adolescent tumors.

Rare Tumors and Histiocytic Disorders

0053: Thyroid gland involvement facilitating the diagnosis of multisystemic Langerhans Cell Histiocytosis

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Keywords: rare tumors, LCH, children

Objective: Thyroid gland involvement is rare in pediatric Langerhans cell histiocytosis(LCH), and is mostly observed in the setting of multi-system (MS) involvement. Due to its rarity, diagnosis of thyroid involvement is challenging.We report two cases of MS-LCH with thyroid gland involvement that were presented to our centre.

Methods: We report two cases of MS-LCH with thyroid gland involvement that presented to our centre.

Results: Patient 1, 15y girl, presented with complaints of polyuria and polydipsia for 6y, with history of pleurodesis 4½y ago in view of multiple episodes of bilateral pneumothorax and suspicion of bronchiectasis/lymphangiomyomatosis. She was diagnosed with hypogonadotropic hypogonadism, primary hypothyroidism and diabetes insipidus during evaluation of primary amenorrhoea, a year ago. At the presentation to our centre, she had pneumonia and was started on IV antibiotics. Evaluation revealed anterior hypothalamic lesion with panhypopituitarism, diabetes mellitus, nodular thyromegaly with primary hypothyroidism, hepatomegaly with

transaminitis and cystic lung disease. Liver biopsy showed features of sclerosing cholangitis. Hormonal replacement was initiated and based on clinical presentation empirical therapy for LCH was started. She succumbed to refractory septic shock and post-mortem biopsies from lung and thyroid confirmed LCH. Patient 2, 9y5mo girl, presented with complaints of breathlessness for 13mo. She was detected with hypothyroidism 12mo ago, during evaluation of constipation in view of peri-anal fissure and started on L-thyroxine supplementation. She had left pneumothorax, 9mo ago, requiring intercostal tube placement. Evaluation at our centre revealed cystic lung disease, liver involvement with transaminitis, diffuse hypoechoic shadows in thyroid gland with hypothyroidism. Bronchoalveolar lavage fluid cytology and fine needle aspiration cytology(FNAC) of the liver were inconclusive. FNAC of thyroid confirmed the diagnosis of MS-LCH and she was started on first line therapy to which she responded well and is disease free after 1y of maintenance therapy.

Conclusions: LCH should be considered in children with thyroid masses, and evaluation for systemic involvement, imaging and FNAC of thyroid in children with high degree of suspicion.

Rare Tumors and Histiocytic Disorders

0054: Characteristics and treatment outcome of children and adolescents with epithelial ovarian neoplasm - a retrospective review from a tertiary cancer center in India

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Keywords: ovarian cancer, children, rare tumors

Objective: Epithelial ovarian neoplasms (EON) are uncommon in the pediatric population. The data on EON in children is limited. We conducted this study to assess the clinical characteristics and outcomes of children and adolescents with EON

Methods: Children ≤18 years of age diagnosed with EON, registered at GCRI, Ahmedabad, India between 1st January 2010 and 31st December 2022 were included for retrospective analysis. Clinical characteristics, treatment details, and outcomes were noted.

Results: One-hundred-sixteen patients were diagnosed with ovarian mass, and eight (0.07%) of them had EON. The median age was 17 years (range 13 – 18 years). One (12.5%) patient had a family history of breast cancer in her grandmother. One (12.5%) child had borderline serous cystadenocarcinoma (stage Ia), three (37.5%) had malignant mucinous cystadenocarcinoma (two stage Ia, one stage II), and four (50%) had malignant serous adenocarcinoma (one stage II, two stage IIIc, one stage IV). One girl with a borderline tumor was treated with surgery only and alive at 79 months from diagnosis. Three (two stage Ia and one stage II) patients underwent primary

debulking surgery without adjuvant chemotherapy. Two patients (stage IIIc) underwent suboptimal interval debulking surgery after neoadjuvant chemotherapy. Two (stage II and IV) patients could not undergo surgery because of progressive disease after neoadjuvant chemotherapy. All patients with stage Ia are alive without evidence of disease at last follow-up. One girl (12.5%) with stage IIb relapsed after 78 months of primary treatment and succumbed to the disease. All three patients with stage IIIc and one with stage IVa had relapse/progression and three patients died due to disease.

Conclusions: Malignant EONs require multimodality of treatment. Children with serous tumors and advanced disease have poor survival. Uniform treatment modalities should be rigorously adopted in children with EON. Genetic counseling is an important part of management.

Rare Tumors and Histiocytic Disorders

0055: Hemophagocytic lymphohistiocytosis in children with primary immune deficiency syndromes: a 5-year prospective cohort study from Pakistan

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Keywords: immune deficiency, hemophagocytic lymphohistiocytosis, children

Objective: Hemophagocytic lymphohistiocytosis (HLH) is a life-threatening syndrome and a serious complication in Primary Immune Deficiency (PID). Newborn screening for genetic disorders and

genetic testing are not available in Pakistan. This study aimed to determine the frequency and clinical characteristics of pediatric HLH with PID, to document the methods to diagnose them, and to evaluate the outcome and factors associated with the outcome in a low-middle income country (LMIC).

Methods: A prospective cohort study was conducted from January 2017 to December 2021. All pediatric malignancies associated with PID were included. The cohort was followed up till June 2022. The outcome was measured in terms of overall survival (OS), and data were analyzed in terms of descriptive statistics. Kaplan–Meier method and log-rank test were applied for survival analysis and the Chi-square test for p-values.

Results: A total of 52 patients of HLH were enrolled with 19 patients (36.5%) of PID-associated HLH. The median age of presentation was 2.0 years +/-2.2 SD. Male to female ratio was 2:1. Griscelli Syndrome (52.6%), Chediak-Higashi Syndrome (42%), and Autoimmune lymphoproliferative syndrome (5.3%) were diagnosed with HLH. HLH was diagnosed as per the HLH-2004 diagnostic criteria. All cases of CHS and GS were diagnosed on the basis of hair-shaft microscopy showing melanin clumping. CHS was differentiated from GS on the basis of characteristic findings of giant granules in neutrophils. ALPS was diagnosed by flow cytometry. All patients were treated as per HLH 2004 protocol, but none could get HSCT. The median overall survival was 6.0 months +/- 1.0 SD. Only 10% of patients have disease in remission, 47.4% expired, and 42% lost follow-up. Mortality analysis showed infection-related mortality in 55%, and progressive disease in 45%. The type of PID (P-Value 0.002) was a statistically significant factor associated with the outcome.

Conclusions: HLH with PID has a very poor prognosis in an LMIC setting. Overwhelming infections and the inability to get HSCT are the major causes of treatment failure. Hair-shaft microscopy can be used as a screening test in a resource-limited setting. Enhanced supportive care and resources are imperative to improve the outcome.

Rare Tumors and Histiocytic Disorders

0056: Melanoma arising in a giant congenital melanocytic nevus. Observation experience

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Keywords: melanoma, children, nevus

Objective: Giant congenital melanocytic nevus (GMN) is a benign proliferation of melanocytes in the skin that is detected immediately after birth or appears during the first weeks of a child's life. The frequency of occurrence is 1:20,000 newborns. The probability of GMN degeneration into melanoma depends on the size of the nevus and ranges from 2.6 to 4.9% for small and medium nevi and from 6 to 20% for giant nevi.

Methods: We observed 3 clinical cases of children 1, 3 and 6 years old with congenital giant nevus. All patients developed disseminated melanoma. When conducting a molecular genetic study using the FISH method (BRAF, KRAS, NRAS), a mutation in the NRAS gene was found in two patients. No mutations were found in the third patient. The treatment included polychemotherapy in the cisplatin/vinblastine dacarbazine (CVD) regimen, further enhanced by immunotherapy - Pembrolizumab. One patient received only immunotherapy with Pembrolizumab, then the combination was used together with Ipilimumab.

Results: A partial effect after polychemotherapy was noted in both patients, which allowed one of them to undergo surgical treatment. The time to progression was 6 months in the first patient and

5 months in the second. A patient who received only immunotherapy also had a partial effect, which allowed for surgical treatment. The time to progression was 30 months. The patient is currently alive with signs of illness.

Conclusions: Therapy of patients with melanoma against the background of GMN is debatable. In case of progression of the disease, dissemination of the process, preference is given to immunotherapy. But, in view of the characteristics of the immune system in young children, this type of therapy cannot always be applied. Radical surgical treatment is also not always possible.

Rare Tumors and Histiocytic Disorders

0057: Approaches to diagnosis and management of patients with PIK3CA-related overgrowth spectrum (PROS) disorders

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Keywords: overgrowth syndrome, rare tumors, children

Objective: PIK3CA-Related Overgrowth Spectrum (PROS) is a spectrum of overgrowth syndromes associated with PIK3CA mutation. This group includes rare disorders characterized by congenital or early-childhood onset of segmental/focal tissue overgrowth, vascular malformations and non-vascular manifestations. The diagnosis of PROS is established in a proband with suggestive findings and mosaic activating pathogenic variant in PIK3CA. Genetic testing of PROS is difficult and requires specific approaches, taking into account the mechanism of syndrome spectrum development, based on the somatic mosaicism (SM) phenomenon. Aims To examine patients with

PROS phenotype, highlight approaches to the diagnosis and treatment of patients with these disorders.

Methods: The analysis included 9 patients who were under observation in Dmitry Rogachev National Medical Research Center of Pediatric Hematology, Oncology and Immunology for the period 2021-2023 with a histological diagnosis of "lipomatosis" and clinical manifestations of PROS. All patients (n=9) underwent molecular genetic testing by using custom-targeted NGS-44 genes-panel "Somatic mosaicism"; the material for the study was DNA isolated from a sample of the affected tissue. In 8/9 of cases, the study was performed in a laboratory based on Dmitry Rogachev National Medical Research Center, 1/9 - in another laboratory. In 4/9 cases, two tumor samples from different surgeries were examined.

Results: Pathogenic variants in PIK3CA were detected in all cases (n=9). According to phenotype and molecular genetic test results, the patients were diagnosed with PROS. At the moment 4 patients are taking treatment with an oral PI3-kinase inhibitor (INN:Alpelesib), the dose regimen is 50 mg 1 time / day. The median duration of treatment is 8 months (range 2-23). In one patient, according to MRI performed 9 months after therapy initiation, there is a decrease of the limb volume by 15%, in the other children taking treatment, timely examinations have not been conducted yet, but after 3-4 weeks of therapy, external changes were noticed – a change in the tumor structure. Manifestations of therapy toxicity were not observed in any case.

Conclusions: The spectrum of syndromes associated with PIK3CA mutation is quite large and requires careful differential diagnosis. Furthermore, creature of diagnosis approaches taking into account the mechanism of syndromes development is an important challenge. Next generation sequencing (NGS) is a universal method for detecting somatic mosaicism, however a negative result does not mean that there is no mutation in the gene and may be associated with limitations of testing methods, which in some cases requires additional research.

Rare Tumors and Histiocytic Disorders

0058: NUT carcinoma in five children：case illustration and literature review

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Keywords: nuclear protein in testis carcinoma, children, rare tumors

Objective: Nuclear protein in testis (NUT) carcinoma (NC) is a rare and poorly differentiated tumor, with highly aggressive and fatal nature. There are no consensus recommendations for the treatment of pediatric patients with NC. Our aim is to summarize the clinical characteristics, diagnosis and treatment progress of NUT carcinoma in children, and to provide guidance for the diagnosis and treatment of NUT carcinoma in children.

Methods: The clinical data of 5 cases of NUT carcinoma diagnosed in the Department of Pediatric Oncology, Sun Yat-sen University Cancer Center from July 2021 to September 2022 were collected. They received chemotherapy comprising cisplatin, cyclophosphamide, doxorubicin alternated with etoposide, ifosfamide. Management of residual masses with surgery should be performed when the primary tumor shrank. Radiotherapy was applied to regions after resection.

Results: The age of the 5 cases was 8-18 years old. The tumor sites were located in the head and neck in 4 patients and vulva in one patient. No recurrence was detected in 3 patients receiving postoperative chemotherapy, and the response was poor in 2 patients who could not be operated first. At present, 4 patients survived and 1 case progressed and died of postoperative infection.

Conclusions: The overall outcome of NUT carcinoma in children is dismal. Complete resection plays an important role in the management of NUT carcinoma. Chemotherapy comprising cisplatin, cyclophosphamide, doxorubicin alternated with etoposide, ifosfamide has the benefit for some patients with NUT carcinoma.

Rare Tumors and Histiocytic Disorders

0059: The successful use of a new drug in patients with Kazabach-Meritt syndrome in Uzbekistan

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Keywords: Kazabach-Meritt syndrome, children, thrombocytopenia

Objective: As we know, Kazabach-Meritt syndrome is a rare disease that occurs in children under one year of age. The syndrome refers to tufted tumors - angiomas and caposchoendotheliomas. Clinically manifested by intense growth, progressive thrombocytopenia, and coagulopathy. In resource-limited countries with delayed and inadequate diagnosis leading to death in 40-50% of cases. The aim of the study was to use new therapy regimens and off-label drugs in the treatment of aggressive hemangiomas in children with Kazabach —Meritt syndrome.

Methods: We described 3 cases of Kazabach - Meritt syndrome diagnosed at the National Children's Medical Center of Uzbekistan (NCMC).

Results: In the first case, a girl was born with a community "kephalohematoma", with severe anemia, thrombocytopenia and coagulopathy. The patient's condition was aggravated by painful, hemorrhagic syndrome over the entire surface of the head and face. The girl was in the intensive

care unit for 34 days, where hemostatic, replacement therapy were administered, the effect of which was negligible. After laboratory and radiological investigations, a consilium of doctors of various specialties was conducted and a diagnosis of Kazabach Meritt syndrome of the parieto-occipital area, aggressive course, consumption thrombocytopenia, coagulopathy, delayed neuropsychomotor development was made. There was a 1-line therapy recommended by ISSVA - propranolol, Vincristine, Hydrocortisone. After the stabilization of laboratory values, we saw no clinical improvement in the patient. Then it was decided to carry out off-label therapy with the drug rapamycin - Sirolimus in a therapeutic dose. As a result of the treatment, the clinical and hemodynamic condition of the girl improved considerably. During the year the tumor on the head has almost disappeared, control ultrasound and head CT scan revealed regression of the tumor mass and residual fibrous tissue with negligible blood flow. It was recommended to continue therapy for another 6 months. The 2nd and 3rd cases were identical. Similarly, 1 month girls with a tumor mass on the right arm with Kazabach-Merritt syndrome. The first-line therapy proved to be ineffective and the patients were switched to off-label therapy with the drug rapamycin - Sirolimus. The second girl had complete regression of the vascular tumor on the arm during 10 months of follow-up. Improvement was also noted in third girl, in the dynamics within three months the tumor growth was suspended, superficial ultrasound showed decreased blood supply in the pathological area.

Conclusions: Thus, with the established aggressive hemangioma as Kazabach-Meritt syndrome, an effective off-label therapy with rapamycin - Sirolimus in a therapeutic dose is recommended. The issue of availability of this new drug in the pharmaceutical market of Uzbekistan needs to be solved.

Rare Tumors and Histiocytic Disorders

0123: Successfully treated mesenteric Castleman's disease in adolescent patient in Armenia

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Keyword: Castleman's disease, mesenteric castleman, adolescent

Background: Castleman disease (CD) is an uncommon disorder characterized by proliferation of the lymphoid tissue. According to the morphology, CD divided into hyaline vascular, plasma cell predominance subtypes and mixed variants. Despite this CD may present as a unicentric form that manifests single lymph node or region of lymph nodes proliferation and more aggressive form, systematic multicentric Castleman disease. Pediatric cases of CD are extremely rare, with only few reported worldwide. In this report, we present the first pediatric CD case from Armenia and its successful management.

Methods: This is a descriptive case report of unicentric CD in 17 years-old male .

Result: A 17-year-old male presented to our clinic with an abdominal mass that was accidentally detected by CT scan. The child had no symptoms. The CT scan revealed a mass with dimensions of 6.2 x 4.3 x 4.2 cm in the small bowel mesentery. After 1 month of follow-up, PET/CT showed a

mass of almost the same size, measuring 6.3 x 4.7 x 4 cm (SUV max = 11.1). The child underwent complete tumor resection, and histological examination confirmed the diagnosis of Castleman disease with hyaline vascular form due to the presence of atrophic germinal centers with onion-skin pattern and interfollicular hyalinized blood vessels. Histopathology was positive for CD 21 and CD23 markers, which are used for identification of follicular dendritic cells. After surgery, the patient had an excellent radiological response. Although the patient has been off therapy for 1.5 years, follow-up examinations are being done on a regular basis.

Conclusions: This report emphasizes the need to consider rare types of tumors in each patient who presents with an abdominal mass in order to avoid further misdiagnosis. It also demonstrates that surgical resection is the best primary treatment modality for unicentric Castleman disease, resulting in long-term survival and low recurrence rates.

Rare Tumors and Histiocytic Disorders

0133: Kabuki syndrome with lymphoproliferation in a child

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Keyword: Kabuki syndrome, lymphoproliferation

Objective: Kabuki syndrome (KS) is a rare congenital disorder characterized by specific facial features, developmental delay, multiple organ abnormalities, and intellectual disability. KS is most often caused by mutations in the KMT2D gene. Patients carrying such mutations have increased

risk for oncologic and hematologic disease. We report a case of KS, highlighting its clinical phenotype as a non-oncologic lymphoproliferative syndrome.

Methods: We report a rare case of KS in a 12-year-boy with multiple organ abnormalities, which manifested by lymphadenopathy, hepatomegaly, splenomegaly and pancytopenia. NGS-analysis revealed a mutation in the KNT2D gene. We treated lymphoproliferative syndrome with mycophenolate mofetil (MM) and intravenous immunoglobulins (IVIG).

Results: Lymphoproliferation is very rare in children with KS. We report a case of pancytopenia with blasts in peripheral blood, lymphadenopathy, hepato-, and splenomegaly. Bone marrow puncture and biopsy of lymphatic nodes did not detect features of oncologic disease. As the patient had characteristic facial features, organ abnormalities, and immune dysregulation, we performed NGS analysis and identified a heterozygous nonsense mutation (R2471*) in the KMT2D gene that was previously reported in another KS patient. At the time of publication, the child is still alive and responds well to treatment.

Conclusions: The clinical manifestation of KS may be varied and atypical, and genetic tests are the gold standard for diagnosing syndromes with immune dysregulation. Early diagnosis and use of immunosuppressant drugs and IVIG may be beneficial for long-term survival of KS patients.

Epidemiology, Policy and Advocacy

0023: Incidence patterns of pediatric non-Hodgkin's lymphomas in the Republic of Armenia

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Keywords: non-Hodgkin's lymphoma, Burkitt lymphoma, children

Objective: According to the ACCIS and EUROCARE, non-Hodgkin's lymphomas (NHL) are the fifth most common type of pediatric cancer in children under the age of 15 years, and they account for approximately 7% of childhood cancer in the developed world. NHL is one of the most common types of cancer diagnosed in adults in Armenia, with an incidence of 4.34 cases per 100.000 population. The main objective of this research was to investigate the incidence patterns of pediatric NHL cases within the Republic of Armenia and to describe disease distribution according to age and sex during the period of 2010–2021.

Methods: The initial data for this retrospective cohort study was derived from ambulance cards, hospitalization journals, and clinical data from the Registry of Blood Diseases at the Hematology Center after prof. R. Yeolyan.

Results: The study included 59 patients with primary NHL diagnosed between January 2010 and December 2021 in Armenia. The majority (69.5%) of patients were male. The median age at diagnosis was approximately 10.6 years. Data analysis showed that during 2010–2021, the average annual incidence of pediatric NHL cases was 3.1 cases per 100.000 children. The incidence and distribution of specific NHL subtypes differs by age and year of diagnosis. In general, the most

common subtypes of pediatric NHL in Armenia during study period were Burkitt lymphoma (26%), diffuse large B cell lymphoma (9.5%), lymphoblastic T cell (11.9%) or B cell lymphoma (12.5%), and anaplastic large cell lymphoma (11.1%). Approximately 23-25% of cases were unclassified lymphomas diagnosed predominantly in the earlier period of the study. The other subtypes are less common, accounting for approximately 6 percent of pediatric NHL in Armenia.

Conclusions: The estimated incidence of pediatric NHL in Armenia is 3.1 cases per 100.000 children. The median age of diagnosis was 10.6 years, males were affected more commonly.

Epidemiology, Policy and Advocacy

0024: Prevalence of breast cancer in Uzbekistan

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Keywords: breast cancer, morbidity, mortality, Uzbekistan

Objective: Breast cancer (BC) is one of the important socio - economic problems in Uzbekistan. The increment of BC is registered every year, including among young women. BC is in first place in the structure of malignant diseases and is a basic reason for mortality and disability of the whole able – bodied population. Our aim is to estimate the morbidity and mortality of BC in Uzbekistan over the last 3 years (2020-2022 years) in view of its gradual increase.

Methods: The statistical indicators for analyse the prevalence of BC in Uzbekistan were taken from the official report in Uzbekistan "Information about malignant tumors morbidity" of 2020-2022 years.

Results: Analysed data ofBCin 2020-22 years showed that 11807 BC patients were identified in the

Republic, with average index 11,3 at 100000 of population. Among them 3317 BCpatients were registered in 2020, 1714 of them were from the country-side. Morbidity index was 9,8. 4121 BC patients were registered in the year 2021, 2585 of them were from the country-side. Morbidity index was 12,0. 4369 BC patients were registered in 2022 year, among them 2585 were from the country - side.Morbidity index was 12.2.At the age of 30 to 54 years old 1739 BC patients were registered in 2020 year, 2092 BC patients - in 2021 year and 1417 BC patients – in 2022 year. BC patients at II stage consist of 53,5% in 2020, 51,8% - in 2021 and 56,0 % - in 2022. Despite the fact that the breasts are accessible for visualization the percent of BC patients into 111-1V stages remains high: 34,4% - in 2020 year, 32,8% - in 2021 year and 31,8% - in 2022 year. The mortality rate reduced from 6,7in 2020 to 5,0 in 2022. The 5-year survival rate of BC patients in 2020-2022 years consisted of 45,1%, 45,1% and 47,6% respectively.

Conclusions: Carrying out analysis of basic indicators of BC prevalence shows that BC morbidity has tendency to increase and takes leading place in structure of malignant tumors morbidity. Introduction of screening programmes in Uzbekistan will improve early diagnosis of BC that allows treatment in good time and improve quantity, length of human life and decrease a disability of population.

Epidemiology, Policy and Advocacy

0060: A cohort study of incidence and mortality in Iranian pediatric patients with cancer

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Keywords: childhood cancer, population-based registry

Objective: The childhood cancer registry in Iran is a hospital-based system and there is not any unique and national registry system for pediatric malignancies in Iran. According to the limitations and requirements, this study was designed to clarify the aspect of childhood malignancies in Iran and promote establishing the Iranian national childhood cancer registry system.

Methods: This cross-sectional longitudinal study was implied on 1500 patients younger than 20-years old diagnosed with any malignancy and admitted at MAHAK Pediatric Cancer Treatment and Research Center (MPCTRC) from 2007 to 2014. Data collection was based on a validated questionnaire with three categories including demographic data, clinical data and type of malignancy, and outcomes. Collected data were analyzed using methods for qualitative and quantitative variables (P-Value 0.05) by SPSS software version 22. The survival rate was calculated by the Kaplan-Meyer method.

Results: This study was implied on 1500 children with a mean age of 6.1 years old. The most common malignancy was acute leukemia (30.7%) followed by central nervous system tumors (27%). At the onset of starting treatment, the rate of conferring with relapse, metastasis, and secondary malignancies was 29%, 19.5%, and 1% respectively. In addition, 52 patients had bone

marrow transplants of whom 14 cases died. Totally, 42% of patients died and the 3-years, 5-years, and 10-years overall survival rates were 67.7% ± 0.01, 60.3% ± 0.01, and 53.8% ± 0.01, respectively.

Conclusions: Establishing a population-based pediatric cancer registry in Iran is necessary and will be useful for improving the survival rate of mentioned patients.

Epidemiology, Policy and Advocacy

0098: Does communication through social media promote blood donation?

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Keywords: blood donation, social media, donors, patients

Objective: In the 1990s, the blood transfusion services (BTS) had marketing campaigns and promotions on TV commercials, radio, and newspaper initially. Stepping into the 20th century, the Internet became popular, and they developed their own website. However, when time went on, they discovered some major issues in their ongoing campaigns: the promotions were boring and the target audience, namely, patients and donors, could not be reached. Unfortunately, the expected blood inventory level has been always under satisfactory. The BTS launched different campaigns and promotions through various channels. With the rise of social media, the BTS established their social media promotion first on Facebook, and since then, this has been the only social media platform they employed. The BTS makes use of different channels to promote blood donation. In the past, the BTS used advertising space in TV and radio, newspapers, and websites.

Results: The BTS started to develop its social media platform but has been restricted to Facebook only. Other social media platforms have been kept in mind but not used because of limited manpower to handle them. The Facebook fan page was established for sharing news and photos. Use of social media targets existing blood donors with a hope to spread the idea of blood donation to their peer networks.

Conclusions: The young generation, whom the BTS believes uses social media in a much higher frequency, is also the target. Social media have become an important part of our lives now as in the motivation of blood donation. The best achievement of blood donation using social media can be attained is by making the best use of technology.

Epidemiology, Policy and Advocacy

0128: Curing childhood cancer with limited resources: first report from Armenia

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Keyword: Childhood cancer, limited resources

Objective: In developed countries, 4 out of 5 children with cancer are cured. Typically, the situation in developing countries is different. Armenia, being among the low- to middle-income countries, currently has a survival rate of pediatric cancer close to high-income countries; however, this was not always the case. The aim of this study is to analyze diagnostic and

therapeutic features of pediatric solid tumors and malignant blood disorders and to evaluate the outcomes for the patients who were diagnosed and received treatment in Armenia from 2008-2022.

Methods: For this retrospective study, the medical records from the Clinic of Chemotherapy of Muratsan Hospital Complex and Hematology Center named after R.H. Yeolyan of Yerevan State Medical University were collected and analyzed for the period of 2008-2022. Epidemiological, social and medical information was collected from patient charts. Medical records of patients were reviewed and summarized, regarding age at diagnosis, sex, place of residence, type of cancer, stage of cancer, presentation of symptoms, first medical consult, initial work-up, treatment course, diagnosis, treatment, relapse, and treatment abroad.

Results: This study included 275 children from ages 0 to 18. Mean patient related diagnosis delay was 30 days, and in 9 patients, exceeded 90 days. There was a positive correlation between parent education level and patient delay. Mean physician delay was 50 days, and in 18 patients, exceeded 90 days. The follow-up information was available for 146 patients – the mean follow-up time being 3.67 years. The rate of abandonment for this set of patients was 53.09% which is on the higher scale. The overall survival for the recorded follow-up time was about 80%.

Conclusions: Developing countries with limited resources, such as Armenia, can achieve outcomes comparable to those of developed countries in regard to pediatric cancer care. However, a number of improvements can be made in our understanding and execution in this realm. In light of these advancements, we have created a national pediatric cancer registry in collaboration with St Jude's Children hospital, which will allow for the collection and analysis of relevant information. A focus on early diagnosis, public awareness campaigns, and continued medical education for medical professionals is of importance as well. There is certainly room to expand the accessibility and availability of pediatric cancer care in Armenia, as well as improve patient outcomes.

Epidemiology, Policy and Advocacy

0061: Results of cancer registration of patients in pediatric oncology and hematology departments: experience of one cancer

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Keywords: cancer, pediatric oncology, cancer registration

Objective: A prerequisite for an objective assessment of the effectiveness of therapy in patients with malignant neoplasms, depending on the type of treatment and the timeliness of diagnostic measures in each case, is adequate cancer registration. To analyze the structure and survival of malignant neoplasms in children treated at the Scientific Center for Pediatrics and Pediatric Surgery (SCP&PS) from 2013 to 2022.

Methods: The study used data on patients from the epidemiological register of the SCP&PS. The registry registered 3736 patients with oncological and hematological diseases: 3008 cases with malignant neoplasms, 280 cases of hematological diseases, 448 cases of benign neoplasms. According to the structure of morbidity among malignant neoplasms: leukemia 40.8%, lymphomas 8.44%, germ cell tumors 7.64%, neuroblastomas 7.35%, soft tissue tumors 6.49%, Bone Tumors 6.25%, CNS tumors 6 19%, kidney tumors 5.56%, retinoblastomas 5.53%, other malignant tumors 2.68%, liver tumors 2.51%. Children with such nosologies as leukemia, germ cell tumors, neuroblastoma, retinoblastoma, kidney tumors, liver tumors, soft tissue tumors are diagnosed at the age of 0 to 5 years. Osteosarcoma is more common in patients 12 to 18 years. Patients with a CNS tumor were detected at the age of 1 to 12 years.

Results: The overall 5-year survival rate among all children with malignant neoplasms was 69%. At the same time, the highest rate is observed in patients with Hodgkin's Lymphoma 88%, retinoblastoma 83%, then nephroblastoma 74%, lymphoid leukemia 73%, non-Hodgkin's lymphoma 69%, germ cell tumors 69%, Bone Tumors 69%, low rates in patients with soft tumors tissues 48%, myeloid leukemia 49%, neuroblastoma 45%, CNS tumors 40%

Conclusions: The presented statistics are not applicable as an indicator of country statistics, as they only reflect data from the hospital register. However, these indicators generally correspond to global trends in the incidence and survival of children with cancer in the world.

Epidemiology, Policy and Advocacy

0129: Experience in training ASHAs (Accredited social health activists) towards childhood cancer diagnosis in India

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Keyword: ASHAs, Accredited social health activists, childhood cancer.

Objective: ASHAs (Accredited Social Health Activists) are trained community health workers (1 million) who are part of India's National Rural Health Mission. India, like most LMICs, does not have a national policy on childhood cancer. In this study, we describe our experience of engaging ASHAs for childhood cancer diagnosis.

Methods: We initiated this program in 2 districts of Uttar Pradesh (India's most populous state) viz. Gautam Budh Nagar and Ghaziabad. Between 15 Jan-15 March 2023, four blocks in each district were covered. A flyer and PowerPoint slides prepared in regional language describing the

warning signs of childhood cancer were used. A pre-and-post test was conducted to gauge their level of understanding and engagement. The training sessions lasted for 1.5 hours each with time for discussion. The classes were conducted by a team of doctors, social workers and counsellors from PGICH with support from CanKids.

Results: Over 8 weeks, 344 ASHAs were trained in batches of 20-30. The same set of questions was administered pre and post-training. The questions assessed myths, facts and early diagnosis of childhood cancer. 99% ASHAs felt that cancer is a fatal illness with no cure. Most were not aware that cancer can occur in children. Among the responders, 68.8% showed a >40% improvement from pre-test value. 10.6% had a score that was less than their pretest value and, in the rest, no or minimal change was noted. The challenges experienced by ASHAs (assessed by interviews of the training team with ASHAs) were inadequate remuneration, overburden due to other health programs and social/cultural barriers.

Conclusions: ASHA workers have been instrumental in bringing healthcare services to the doorstep of people living in remote and rural areas. Training these grassroot workers and clearing their misconceptions can go a long way in improving cancer outcomes in LMICs.

Epidemiology, Policy and Advocacy

0140: The approach of pediatric oncologist/hematologists toward hereditary cancer predisposing syndromes among children. A qualitative study design

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Keyword: hereditary cancer, predisposing syndromes

Objective: Annually, 29% of cancer-diagnosed children require evaluation for hereditary cancer predisposition syndromes (HCPS) and 10% inherit cancer fault genes. The current study aims to investigate the practices and attitudes of pediatric oncologists/hematologists, toward HCPS among children in Armenia.

Methods: Qualitative data was collected through in-depth interviews and focus group discussions. Pediatric oncologists and hematologists in Armenia were approached through convenient sampling. Field guides have been developed based on the Socio Ecological Model of Health to facilitate semi-structured interviews. The field guide contained 4 domains: reasons to diagnose HCPS, barriers, facilitators to establish the cancer predisposition clinic (CPC) in Armenia, and suggestions to overcome the existing obstacles. To analyze the data conventional analysis with a deductive approach was done. Four themes were predetermined: cancer prevention, patient survival, and patient management in the context of CPS and CPC establishment in Armenia.

Results: In total, 10 individuals were interviewed. The male-to-female ratio was 1:5. The median age was 30 (26:68) and the median working experience was 6,5 (3:45). The majority of interviewees did not perceive cancer predisposition as CPS rather than as a family history of cancer. Most oncologists/hematologists didn't think that identification of CPS will prevent cancer, however, it might improve treatment outcomes and survival. In case of CPS suspicion, children weren't referred for genetic diagnosis or monitored for second cancer. This issue was caused by low prioritization of the problem, lack of financial resources, stigma toward cancer, and limited technical and human capacity. The majority of physicians admitted that the establishment of CPC will allow identifying children with HCPS, and improve the quality of provided care.

Conclusions: Prioritizing medical care for children with HCPS is crucial. CPC establishment will allow for identifying, diagnosing, and managing children with HCPS as well as improving pediatric cancer outcomes.

Epidemiology, Policy and Advocacy

0141: The role of primary health care facilities in identifying and monitoring children with hereditary cancer predisposition syndromes in Armenia. Qualitative date from Armenia

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Keywords: Cancer predisposition, childhood cancer, LMIC, survivorship

Objective: Establishing a hereditary cancer predisposition clinic (CPC) in Armenia will allow us to identify children with hereditary cancer predisposition syndromes (HCPSs) and provide them with appropriate medical care. The study aims to investigate the potential role of pediatricians in primary health care facilities (PHCF) in managing children with HCPSs.

Methods: The qualitative study design was utilized. For data collection purposes, in-depth interviews and focus group discussions were held. For this purpose, open-ended questions have been developed based on the Socio Ecological Model of Health. The field guide contained 5 domains: the role of the primary healthcare facilities, necessary training, educational materials, and suggestions to overcome the existing obstacles. Pediatric oncologists/hematologists,

pediatricians, and neonatologists were approached through convenient sampling. Conventional analysis with a deductive approach was done to analyze and interpret data.

Results: Fourteen physicians were interviewed. The male-to-female ratio was 1:6. The median age was 44 (26:68) and the median working experience was 21 (3:45). Both pediatric hematologists/oncologists and neonatologists/pediatricians agreed that PHCFs didn't take any measures to identify HCPSs. Moreover, regular check-ups of those who have significant cancer family history weren't done either due to lack of knowledge. Interviewees from those two groups agreed that awareness-raising procedures are required to provide pediatricians with the necessary knowledge to manage children with HCPS. Among the hematologists/oncologists, there was controversy to provide PHCFs with referral guidelines or to conduct comprehensive training on HCPS. Oppositely, neonatologists/pediatricians stated that both of these measures were required. Further, it was agreed that HCPS management should be done by a multidisciplinary team consisting of a pediatrician, pediatric hematologist/oncologist, geneticist, and psychologist.

Conclusions: To ensure pediatricians' involvement in the HCPS identification process, referral guidelines should be provided to the PHCF and continuous awareness-raising campaigns should be conducted.

Epidemiology, Policy and Advocacy

0127: The impact of the COVID-19 pandemic on the functioning of the oncology service of the Republic of Tajikistan

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Keyword: COVID-19, oncology service, Tajikistan

Objective: The COVID-19 pandemic has become a severe challenge for the health systems of all countries. This is to a greater extent, due to the peculiarities of functioning and the contingent of patients which refers to the oncological service and the work of oncological institutions. Taking into account the level of prevalence of COVID-19 in the Republic of Tajikistan, treatment, diagnostics and consultations of patients at the RCRC continue in full. However, the pandemic has made some adjustments to their work. Purpose of the study. To study the degree of impact of the COVID-19 pandemic on the work of pre-hospital and hospital structures of the oncology service of the Republic of Tajikistan.

Methods: The statistical reports of oncology institutions for March-November 2020 and comparative data for 2019 were analyzed, and the case histories and outpatient cards of patients in the oncouroproctological and gynecological departments were analyzed.

Results: An analysis of the work of the pre-hospital structures of the oncology service of the republic showed that, in general, the number of patients visited decreased by 9.1%, especially in the Sughd and Gorno-Badakhshan regions, initially diagnosed patients were registered at 8.1% less than last year. Detected 3.4% of patients with COVID-19 among those who applied to oncology

clinics. 25 physicians (24%) out of 33 secondary COVID-19 infections have been identified. The volume of palliative care decreased by 8.9%, and 16% of registered patients had a deterioration in the condition associated with a violation of the treatment regimen due to infection with COVID-19. Remote counseling and monitoring of the condition of patients have been widely introduced. A study of the work of the oncouroproctological hospital revealed a decrease in the flow of hospitalized patients by 9.1%, a decrease in the number of operations by 8.7%, and, accordingly, a decrease in surgical activity from 58.8% (2019) to 50%. An increase in radical (31%) interventions was noted. In the gynecological oncology department, 5.8% of patients were diagnosed with COVID-19, a pronounced clinical course was observed in 66% of them, and all of them were suspended treatment measures from 2 to 4 weeks.

Conclusions: The volume of oncological care both in pre-hospital structures and in individual hospitals is generally not limited. The prioritization of the work of oncology facilities made it possible to strike a balance between the risk of hospitalization and infection with COVID-19, expand remote counseling, and reduce pressure on the medical staff.

Epidemiology, Policy and Advocacy

0156: Survey results: pediatricians' pediatric cancer awareness and attitudes to early cancer diagnosis in Russia

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Keywords: childhood cancer, diagnosis delay, pediatrics

Objective: Early cancer diagnosis is a key element to successful treatment outcomes in children with cancer. Children with late cancer diagnosis have higher risks of dismal treatment results.

Aim: To determine current level of pediatric cancer awareness and attitude concerning barriers to timely diagnosis by online surveying pediatricians in Russia.

Methods: A cross-sectional questionnaire was developed to survey pediatricians in Russia. A focus group of 10 pediatricians and pediatric oncologists reviewed and revised the initial set of items by iterative approach. The online approach captured demographic data, knowledge on pediatric cancer and potential barriers in early pediatric cancer diagnosis.

Results: A total of 597 responses were received. Most of the survey participants were women (94.8%, n=566), the median age was 41 years. Lack of appropriate training in pediatric oncology was revealed: 36.2% (n=216) of the surveyed pediatricians has no education in pediatric oncology, 60.5% (n=361) had training only during medical school education, and 18.1% (n=108) – as part of postgraduate or continuous medical education respectively. Half of pediatricians (54.7%, n=327) have never seen primary pediatric cancer patients in their practice. Most of the surveyed (79%, n=454) scored less than 50% correct answers about pediatric cancer. Three most common

identified barriers included: parents'; late seeking healthcare, lack/shortage of pediatric oncologists in primary care facilities, and lack of direct access to the necessary diagnostic tests on the pediatrician level.

Conclusion: Importantly, this study revealed a low level of pediatric cancer awareness and limited training in pediatric oncology among Russian pediatricians. We revealed a significant variety of barriers, from scarce training opportunities to health system barriers. Our results demonstrate a great need for targeted interventions to address the most significant barriers in Russia. Next steps should improve professional training, increase public awareness and referral systems.

Clinical, Translational Research and New Drugs

0025: Efficacy and safety of larotrectinib in pediatric patients with tropomyosin receptor kinase (TRK) fusion cancer: an extended follow-up

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Keywords: Larotrectinib, neurotrophic tyrosine receptor kinase, infantile fibrosarcoma, soft tissue sarcoma

Objective: Neurotrophic tyrosine receptor kinase (NTRK) gene fusions are oncogenic drivers in various tumor types. Larotrectinib is a highly selective TRK inhibitor approved for treating pediatric and adult patients with TRK fusion cancer. Larotrectinib demonstrated an objective response rate (ORR) of 88% across 78 pediatric patients with non-CNS cancers (van Tilburg et al, SIOP 2021). To better determine the efficacy outcomes in a more mature dataset with a longer follow-up, we report here on the first 70 pediatric patients enrolled as of December 2019 with a data cut-off of July 2021.

Methods: Patients aged 18 years with TRK fusion cancer in larotrectinib clinical trials were included. Responses were investigator-assessed (Response Evaluation Criteria in Solid Tumors v1.1).

Results: Tumor types included infantile fibrosarcoma (57.1%), other soft tissue sarcoma (35.7%), congenital mesoblastic nephroma (2.9%), thyroid cancer (2.9%), and melanoma (1.4%). With longer follow-up, the ORR was 87% (95% confidence interval [CI] 77-94): 31 (44%) complete response (CR; including two pending confirmation and nine pathological CR), 30 (43%) partial response (PR), seven (10%) stable disease, one (1%) progressive disease, and one (1%) not determined. Median time to response was 1.8 months; one patient converted from PR to CR after ≥2 years on treatment. Treatment duration ranged from 1.0 to 62.6+ months. Medians for

duration of response and progression-free survival (PFS) were 43.3 (95% CI 23.2-non estimable [NE]) and 45.1 months (95% CI 22.1-NE); median follow-ups were 34.0 and 33.3 months, respectively. Median overall survival (OS) was not reached; median follow-up was 35.2 months. The 36-month OS rate was 92%. Treatment-related adverse events were mostly Grade 1-2. **Conclusions:** With this extended follow-up, larotrectinib demonstrated durable responses and prolonged PFS (median >3.5 years), and a favorable long-term safety profile in pediatric patients with TRK fusion cancer. This demonstrates the importance of identifying NTRK gene fusions in pediatric solid tumors.

Clinical, Translational Research and New Drugs

0031: Evolving system of childhood cancer delivery - an extrapolation from adult model

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Keywords: children's cancer, Pendharkar model, LMIC

Objective: Children's cancer is one of the most curable cancers in the developed world. In LMIC the care is hampered mainly because of access challenges. The access combines together-physical access to pediatric cancer center, financial sustainability of the care, equitability of the access, non adherence to the lengthy scheduled treatment, low socio-economic back up. Addressing these issues is pivotal in improving cancer survival rates in LMIC. The aim of this study was to analyze a

cancer care delivery model (Pendharkar model) existing over 150 regions of India, for the last 8 years which has been able to resolve access issues in adult cancer. Extrapolation of a similar model can greatly improve pediatric cancer care and improve survival.

Methods: Methodology- A well-functioning, innovative cancer care delivery model at scale has been established using the state as a major health provider. A concept of "technomentoring" using multiple levels of physical and technical mentoring is used to make the system sustainable. All elements of the health system management will be analyzed to propose a similar model in pediatric cancer care.

Results: The district cancer care model was initiated in 2014 and expanded to eight states of India, covering more than 300 million population. More than 200 general duty physicians were trained to offer cancer care locally. A system of governance was created through state orders . It serves across various ethnicities, social backgrounds, different socio-economic setups, from well urbanized to complete rural locations. It offers care to a few thousand cancer patients per day.

Conclusions: It is feasible to create an equitable cancer care model using alternate oncology workforce, through capacity enhancement, task sharing, guided shared care using state owned low cost health system, after a short term training and constant mentoring. It appears to be the only way to improve care in the short term using existing resources.

Clinical, Translational Research and New Drugs

0095: Artificial intelligence in pediatric dermato-oncology: neural network integration into a mobile app

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Keywords: Artificial intelligence, dermato-oncology, mobile app

Objective: The search for additional non-invasive diagnosis methods of skin tumors in children is relevant to determine the treatment and exclude inappropriate surgery. Ten years ago, the use of neural networks (NN) as artificial intelligence (AI) seemed a distant prospect. Currently, application of NN is becoming an increasingly popular and improving approach in medicine. The purpose of the study is development of a neural network learning to recognize four types of melanocytic nevi in children, integration into a mobile app.

Methods: Clinical and dermatoscopic analysis of skin tumors was carried out in 600 children from the age of 1 to 18 years. In 65 cases the tumors were removed. Distributions of pathological type were obviously different. There were 28 dermal nevi (43.1%), 22 complex nevi (33.8%), 7 pyogenic granulomas (10.7%), 4 Spitz-nevi (6.2%), 2 blue nevi (3.1%), and 2 melanomas (3.1%). Eight patients with pyogenic granulomas and two patients with melanoma were excluded from the test set during NN training, so the test set included 56 dermoscopic images. Due to the small amount of images in the training sample augmentation was performed. The database has been increased from 600 images to 1800. NN is written in the machine language Python. The machine learning framework was TensorFlow 2.0. This model uses the "supervised learning" paradigm. Each

element of the sample had a class affiliation. The network architecture is based on the pre-trained model "EfficientNet B7".

Results: After a period of learning on the test set, an accuracy of 83% was achieved. Mathematical metrics calculated in the Scikit-learn library. Sensitivity was 100% (blue nevus), 73% (complex nevus), 93% (dermal nevus), 75% (Spitz-nevus), and specificity was 98%; 94%; 82%; 98%, respectively. AI was integrated into the mobile app «KIDS NEVI».

Conclusions: A mobile app created by integrating neural networks makes it possible to obtain an analysis of a dermatoscopic image, identify the type of melanocytic nevus. Dermatoscopic analysis of a skin tumor and a mobile app are aptitude "double control" of rapid and correct clinical diagnosis in order to prescribe appropriate treatment.

Clinical, Translational Research and New Drugs

0154: Atezolizumab for the treatment of locally advanced or metastatic non-small-cell lung cancer

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Keywords: Atezolizumab, NSCLC, immunotherapy

Introduction: The latest treatment of NSCLC is immunotherapy. Atezolizumab is a monoclonal antibody that targets the PD-L1 protein and activates T cells by binding to them.

Methods: We conducted a study to evaluate the effectiveness of Atezolizumab among patients with NSCLC, in the absence of EGFR, ALK, ROS1 mutations and regardless of the level of PDL-1 expression. Five patients were evaluated.

Results: A 56-year-old patient with lung adenocarcinoma was treated with surgery, chemotherapy and radiation therapy (RT). After 1.5 years, metastases in the brain and adrenal gland were detected. The brain lesion was removed followed by RT and 6 cycles of Atezolizumab with complete regression of the lesion in the adrenal gland. The duration of remission was 11 months. Two patients (Stage III NSCLC) underwent neoadjuvant treatment. After progression on standard chemotherapy one patient received treatment with Atezolizumab (11 cycles) with partial regression lasting for 11 months. In the second case the patient received chemotherapy with Atezolizumab with subsequent pneumonectomy with complete regression.

The fourth patient was 58-year-old with stage III squamous cell carcinoma of the tracheal bifurcation. Endoscopic removal of the tumor was performed. After 3 years progression was observed. Stereotactic RT with cyberknife and 4 cycles of chemotherapy were performed with positive dynamics. After 2 months progression was observed. Patient received 9 cycles of Atezolizumab with complete regression lasting for 20 months. The 5th case was a 74-year-old patient with stage III adenocarcinoma who received three cycles of chemotherapy and subsequent RT with stabilization. After 5 months the tumor progressed, with metastasis to the adrenal gland. After 7 cycles of Atezolizumab, partial regression was noted within 6 months. A total of 46 cycles of immunotherapy were carried out and three patients are continuing treatment. In general, treatment with Atezolizumab was tolerated well. One patient developed interstitial pneumonia, which was cured with antibiotics.

Conclusion: The results obtained indicate the effectiveness of Atezolizumab monotherapy or in combination with chemotherapy. The duration of remission ranged from 7 to 20 months with good tolerability of the drug. All this makes it possible to recommend treatment with Atezolizumab for locally advanced and metastatic NSCLC in the first line.

Survivorship Symposium

0013: Long-term effects in survivors of childhood central nervous system tumors

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Keywords: CNS tumors, survivorship, long-term effects

Objective: In Belarus, there is no evidence-based approach to monitoring patients over 18 years of age with childhood cancer, despite the global relevance of research in this area. Children cured of neoplasms of the central nervous system (CNS) may experience disorders of the nervous and endocrine systems, cognitive impairment, and subsequent tumors.

Methods: The study included 96 patients diagnosed with CNS tumors (55 boys, 41 girls) between 2002 and 2012. The median age at diagnosis was 3.8 years (0-17.9 years). 31 (32%) patients received radiation therapy (RT). The median follow-up period from the anticancer treatment end was 10.5 years (5 – 22 years).

Results: The 10-year CI of remote consequences' development in patients under three years old amounted to 31.7 ± 7.4%, and over three years old 40.8 ± 6.8% (p = 0.353). CI of remote consequences in patients who received the RT amounted to 74.8 ± 9.5%; without the RT - 20.1 ± 5% (p 0001 In 39 (40.6%) patients, adverse events were detected in the long-term period, including endocrine system diseases in 37 (38.5%) patients, the cardiovascular system in two (2.1%), and subsequent tumors in three (3.1%). The 15-year CI of subsequent tumors was 7.4 ± 5.4%. Two patients were diagnosed with a second CNS tumor and one with thyroid gland cancer. All received RT during the initial treatment.

Conclusions: When monitoring patients cured of CNS tumors, it is necessary to remember the increased risk of developing antitumor treatment complications in the long-term period. RT can lead to undesirable phenomena in the endocrine system 5-10-15 years after treatment. Diseases from the endocrine system can be "hidden" in nature and require active detection using additional research methods. Patients who received antitumor treatment with RT for CNS tumors in childhood have an increased risk of developing subsequent tumors in the long term.

Soft Tissue Sarcomas

0077: Infantile nodular fasciitis masquerading as infantile fibrosarcoma

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Keywords: sarcoma, rare malignancy, histopathology

Objective: Nodular fasciitis (NF) is a common benign mesenchymal tumor that can occur at any age and site, with no gender predisposition. It is often referred to as a pseudosarcoma due to its histological resemblance to sarcoma. NF commonly presents as a solitary, painless, and slow-growing mass in the limbs, head and neck, or trunk.

Methods: Herein, we present a case of a 6-year-old boy with a tumor-like mass on the neck, with three months of history. On physical examination, a hard and immobile tumor with a diameter of approximately 2 cm was identified on the surface of the neck, without skin changes. Computer tomography revealed a subcutaneous tumor on the neck measuring 1.7 x 1.0 cm, with peripheral contrast enhancement and central necrosis. Reactive lymphadenopathy of the cervical and mesenteric lymph nodes was also noted. Histologically, the tumor was composed of moderately pleomorphic spindle cells arranged in a loose fascicular to storiform pattern. The mitotic activity was conspicuous, with 8-10 mitotic figures per high power field. The immunoprofile of the tumor was unspecific, showing positivity for smooth muscle actin (SMA) and desmin, and negativity for caldesmon, myosin heavy chains (MyHCs), CD34, TLE, S100, myogenin, and anaplastic lymphoma kinase (ALK). The initial diagnosis was infantile fibrosarcoma based on its histology, which is a soft tissue malignant tumor that requires more aggressive treatment.

Results: The final diagnosis of NF was made with a negative FISH testing for the ETV6-NTRK3 gene fusion, and a positive MYH9-USP6 fusion.

Conclusions: In conclusion, NF should be included in the differential diagnosis of soft tissue tumors that mimic sarcoma, particularly in children. Nodular fascitis and infantile fibrosarcoma have similar histological, immunohistochemical, and radiological features, making the differentiation challenging. To avoid overtreatment, pathologists should be vigilant and consider additional molecular tests to make an accurate diagnosis.

Soft Tissue Sarcomas

0078: Clinical prognosis and molecular profile of pediatric rhabdoid tumors: a report from China

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Keywords: sarcomas, children, rhabdoid tumors

Objective: Rhabdoid tumors are rather rare, highly aggressive malignancies usually taking a dismal outcome.

Methods: We retrospectively reviewed data from 66 patients < 18 years of age diagnosed with rhabdoid tumors at Sun Yat-sen University Cancer Center from April 1, 2011, to April 30, 2022. Panel sequencing (830 DNA and 395 RNA) was performed on 10 tumors from 10 patients. The Kaplan-Meier method was used to estimate overall survival (OS) and event-free survival (EFS). The variables with P 0.05 were entered into the multivariate analyses with the Cox proportional hazards model. Significance was considered at a value of P 0.05. SPSS Statistics (version 26.0) was used for all statistical analyses.

Results: The median age of 66 evaluable patients at diagnosis was 2.6 (range 0.04-13.58) years old. The subtype included Rhabdoid tumors of the kidney (RTK) (n = 20), Rhabdoid tumors of soft tissue (MRT) (n = 26), and Atypical teratoid/rhabdoid tumor (AT/RT) (n = 20). Half of the 66 patients had received a tri-modality treatment (chemotherapy, surgery, and radiotherapy). No

germline aberration was detected in the 10 patients. SMARCB1 mutation (2/10) was the most common gene alteration. The median TMB of the 10 patients was 0.47/Mb (0–6.57). Two-year EFS and OS for the entire cohort were 41.3% (95% CI, 0.000-28.503) and 43.1% (95% CI, 6.513-31.227), respectively. In the multivariate analysis, patients ≥ 2 years (HR, 0.448; 95% CI, 0.222-0.906; P = 0.025), received complete resection (HR, 0.135; 95% CI, 0.043-0.428; P = 0.001), or partial resection (HR, 0.280; 95% CI, 0.088-0.888; P = 0.031), or radiotherapy (HR, 0.190; 95% CI, 0.086-0.422; P = 0.000) had better OS. Those patients who received radiotherapy had a better EFS (HR, 0.244; 95% CI, 0.122-0.491; P = 0.000).

Conclusions: This multimodality regimen has resulted in a significant improvement in EFS and OS for patients with rhabdoid tumors, while radiotherapy is an independent prognostic factor.

Soft Tissue Sarcomas

0079: Clinical profile, outcomes and prognostic factors of parameningeal rhabdomyosarcoma in children treated at a single centre over a decade

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Keywords: children, parameningeal rhabdomyosarcoma, chemotherapy

Objective: Parameningeal Rhabdomyosarcomas (PM-RMS) in children are challenging due to vicinity to critical anatomic structures, delayed advanced presentations, increased local recurrences and tendency for intracranial spread. Ten-year Event Free Survival (EFS) of 62% have been reported from western world for localized disease and data is limited from the developing world. We studied clinical profile, outcomes, and prognostic factors in PM-RMS.

Methods: Treatment naïve children ≤15years with biopsy-proven PM-RMS from January 2013 to December 2021 were retrospectively analyzed. Staging included FDG-PET CT scan, bilateral bone-marrow biopsies, cerebrospinal fluid analysis. Patients received 12 cycles of VIE (vincristine,

ifosfamide, etoposide) +VAC (vincristine,actinomycinD,cyclophosphamide) or VAC only. Local therapy at 10-12 weeks of induction was radiotherapy (RT)+/-surgery where possible and early RT for intracranial extension(ICE) with dural impingement. Kaplan-Meier method was used for survival estimates, Cox proportional hazards regression model for prognostic factors.

Results: Seventy-six patients had PM-RMS and formed study cohort. Median age was 6.7years(range,3.2-15years), male to female ratio was 1.8:1. Metastases was present in 14.5% (n=11:lungs-8,bone-2,bone marrow-1). ICE was present in 46.1%(n=35), dural impingement in 68.6%(n=24/35). Histology was alveolar in 49%(n=25). PAX3/7 was positive in 28.8%(n=17/59). Median tumor size(tsize) at baseline was 5.2cm(range,1.2-12.8cm). All(n=71) received RT, 5 also underwent surgery. Relapses were: locoregional-55.2%, metastatic-31%, combined-10.3%. Median follow-up was 65months(range,53-76months). Four-year EFS, Overall Survival (OS) of the whole cohort were 47.3%(95%CI:34.8%-58.8%) and 51.7%(95%CI:38.0%-64.0%) respectively. Four-year EFS, OS of localized and metastatic cohort were 54.7%(95%CI:41.3%-68.1%), 56.0%(95%CI:42.0%-70.0%) and 9.1%(95%CI:0%-26.5%), 18.2%(95%CI:0%-47.8%) respectively. Univariate analysis showed site of primary(p=0.034), ICE(p=0.047), metastases(p=0.00), tsize(p=0.008) prognostic for EFS. Metastases (HR-3.38,95%CI:1.57-7.26, p=0.002), tsize(HR-1.17,95%CI:1.02-1.34,p=0.026) retained significance on multivariate. For OS, gender(p=0.032), site of primary(p=0.037), ICE(p=0.042), metastases(p=0.003), tsize(p=0.008) were prognostic on univariate. Metastases (HR-2.97,95%CI:1.27-6.95, p=0.012), tsize(HR-1.21,95%CI:1.03-1.41,p=0.019) retained significance on multivariate.

Conclusions: Survival of children with localized PM-RMS in our study is comparable to the reported literature probably due to application of RT in all despite greater proportion of larger tumors, unfavorable sites of primary and intracranial extension while metastatic patients have dismal outcomes.

Soft Tissue Sarcomas

0080: Clinical profile, outcomes and prognostic factors of first relapse in children with rhabdomyosarcoma: a single institutional retrospective study from India

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Keywords: rhabdomyosarcoma, children, chemotherapy

Objective: Rhabdomyosarcoma (RMS) comprises the largest group of soft tissue sarcoma affecting children. While long-term survival outcomes have improved for patients with localized disease, an estimated 30% relapse; close to 70% of metastatic relapse. We studied clinical profile, outcomes and prognostic factors for relapsed RMS.

Methods: Within the entire cohort of children ≤15 years treated for RMS between January 2013 and December 2021, we retrospectively analysed those at first relapse/progression. Restaging was done by FDG-PETCT scan and bilateral bone-marrow biopsies. Early relapse, progression on treatment and disseminated relapse received upfront palliation. Salvage chemotherapy included a backbone of VTC (vincristine, topotecan, cyclophosphamide) + VAC (vincristine+ doxorubicin+ cyclophosphamide). Local therapy as surgery (upfront resection wherever feasible), radiotherapy (RT) or both were offered at 10-12 weeks.

Results: Of 275 registered patients with RMS in the study period, 83 relapsed or progressed. Median time to relapse-15months (range,1-37months). Site of relapse: locoregional-45%(n=38), isolated metastases-28%[n=24,(lungs-11,bone-7,bonemarrow-8,CNS-7,others-9, either alone/combined)], combined-22%(n=19). Molecular (PAX3/PAX7) translocation was positive in 40%(n=27) of patients where reports were available. Forty-five children received only palliative

treatment (Early relapse, progression on treatment and disseminated relapse), twelve defaulted. In remaining 26 patients local therapy was: RT- 77% (n=20, either] definitive-9 or post-operative-11), surgery- 61.5% (n=16, either upfront-7 or after induction-9). At a median follow-up of 33months, 2-year Event Free Survival (EFS) and Overall Survival (OS) of treated cohort were 48% (95%CI:31%-72%) and 68%(95%CI:52%-89%) respectively. Univariate analysis identified VTC-based chemotherapy prognostic for EFS (95%CI:39%-83%). Age, gender, tumor size at baseline/relapse, time to relapse, site of relapse, histology, molecular status or type of local therapy were not prognostic for survival, probably due to small sample.

Conclusions: Since the majority of patients have unfavourable features at first relapse, strong consideration should be given to enrolment on clinical trials. For patients with favourable features at first relapse, salvage multimodality treatment with VTC-based chemotherapy may be an appropriate approach.

Soft Tissue Sarcomas

0081: Embryonal rhabdomyosarcoma with FOXO1 gene rearrangement

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Keywords: rhabdomyosarcoma, children, soft tissue sarcomas

Objective: Soft tissue sarcomas (STS) are a heterogeneous group of malignant neoplasms (MNs) of

mesenchymal origin, primarily occurring in soft tissues. Rhabdomyosarcoma (RMS) accounts for about 45% of all cases of SMT in children, embryonic type (ERMS) - 75%, alveolar type (ARMS) - 25% of all RMS. When stratifying patients into risk groups, the histological type of RMS is always taken into account. Patients with ERMS tend to have a better prognosis than those with ARMS. When conducting a cytogenetic study, more than 70% of cases of ARMS are determined by the PAX / FOXO1 translocation, associated with a poorer prognosis.

Methods: We observed two clinical cases of patients with ERMS treated in Pediatric Oncology and Hematology of L.A. Durnov National Medical Research Center under the CWS-2009 protocol. In both cases, the diagnosis was established on the basis of immunohistochemical studies. During the cytogenetic study, the PAX3-FOXO1 translocation was detected in patients, which is associated with an unfavorable prognosis and required intensification of therapy.

Results: Currently, one patient has completed therapy and is in the observation group, with no signs of relapse. The second patient showed progression of the disease, the child was recognized as incurable.

Conclusions: Molecular genetic testing to determine PAX/FOXO1 status confirming ARMS has been performed since 1995. When using modern treatment protocols, risk group stratification is not based on a molecular genetic study, but is based only on the histological variant of the tumor. However, there is a distinct subpopulation of patients with ARMS and PAX/FOXO1 negative. PAX/FOXO1 status determination is highly recommended in all patients with ARMS. However, when making a diagnosis of "Embryonal rhabdomyosarcoma", confirmed by only immunohistochemical methods, a molecular genetic study is not performed in routine practice. Based on our observations, we identified 2 cases of PAX/FOXO1 translocation in patients with a histological diagnosis of ERMS, which may aggravate the prognosis. We strongly recommend that all patients with ERMS undergo a molecular genetic study.

Soft Tissue Sarcomas

0082: Oral vinorelbine and continuous low doses of cyclophosphamide in pediatric rhabdomyosarcoma: a real-world study

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Keywords: Rhabdomyosarcoma, metronomic therapy, vinorelbine

Objective: Metronomic maintenance therapy (MMT) has significantly improved the survival of patients with high-risk rhabdomyosarcoma in clinical trials. However, there remains a lack of relevant data on its effectiveness in real-world situations.

Methods: We retrospectively retrieved data of 459 patients < 18 years of age diagnosed with rhabdomyosarcoma at Sun Yat-sen University Cancer Center from January 2011 to July 2020 from our database. The MMT regimen was oral vinorelbine 25-40 mg/m² for twelve 4-week cycles on days 1, 8, and 15, and oral cyclophosphamide 25-50 mg/m² daily for 48 consecutive weeks.

Results: A total of 57 patients who underwent MMT were included in the analysis. The median follow-up time was 27.8 (range: 2.9 - 117.5) months. From MMT to the end of follow-up, the 3-year progression-free survival (PFS) and overall survival (OS) rates were 40.6 ± 6.8% and 58.3 ± 7.2%, respectively. The 3-year PFS was 43.6 ± 11.3% in patients who were initially diagnosed as low- and intermediate-risk but relapsed after comprehensive treatment (20/57), compared with 27.8 ± 10.4% in high-risk patients (20/57) and 52.8 ± 13.3% in intermediate-risk patients who did

not relapse (17/57). The corresponding 3-year OS for these three groups was 65.8 ± 11.4%, 50.1 ± 12.9%, and 55.6 ± 13.6%, respectively.

Conclusions: We present a novel study of MMT with oral vinorelbine and continuous low doses of cyclophosphamide in real-world pediatric patients with RMS. Our findings showed that the MMT strategy significantly improved patient outcomes and may be an effective treatment for high-risk and relapsed patients.

Soft Tissue Sarcomas

0093: Leptomeningeal metastasis in children with rhabdomyosarcoma of parameningeal localization

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Keywords: Rhabdomyosarcoma, leptomeningeal metastasis, multidisciplinary approach

Objective: Soft tissue tumors account for up to 8% of all malignant neoplasms in children, 45% of which are rhabdomyosarcoma. According to the intergroup study group on the study of rhabdomyosarcoma, more than 7% of patients with parameningeal rhabdomyosarcoma develop

leptomeningeal metastasis. The aim of the study is to report on the results of treatment of children with intracranial spread of rhabdomyosarcoma and leptomeningeal metastasis.

Methods: The study (2003-2021) included 45 patients aged 1 to 17 years with a diagnosis of parameningeal rhabdomyosarcoma with intracranial. The primary tumor spread to the orbit in 7 (15%) cases, the skull base in 7 (15%) cases, the middle ear in 4 (8%) cases, the nasopharynx in 3 (6%) cases, and the brain substance was affected in 16 (35%). Metastases in regional lymph nodes were determined in 7 (15%) patients. Multiple metastatic lesions of bones and bone marrow - 4 (9%) cases, leptomeningeal metastases - in 2 (4%). Drug treatment according to the protocols approved by the N.N. Blokhin National Medical Research Center of Oncology received 45 (100%) patients. Radiation therapy was performed in 33 patients (74%), while SOD 50 Gy was administered to the primary tumor. The affected lymph nodes of the neck were irradiated in 10 (23%) patients, SOD 45.0 Gy. Surgical treatment was performed in 15 patients (34%).

Results: During the observation period from 12 months to 14 years, 21 (49%) patients are alive. 21 patients (51%) died from tumor progression, 1 (2%) died from complications of special treatment.

Conclusions: The treatment of this group of patients is one of the urgent problems of pediatric oncology, which is based on polychemotherapy, supplemented by intrathecal administration of anticancer drugs and craniospinal irradiation. The development of new therapies requires a multidisciplinary approach to achieve a significant improvement in the survival of children with leptomeningeal metastases.

Soft Tissue Sarcomas

0106: Effective management of challenging infantile fibrosarcoma in resource-limited settings: a clinical case study

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Keywords: infantile fibrosarcoma, resource-limited settings, targeted therapy, NTRK3 mutation, Larotrectinib

Objective: Infantile Fibrosarcoma (IFS) is a rare cancer that primarily affects infants and young children. It's a challenging condition to manage, especially in resource-limited settings where access to specialized oncology care is restricted. This case report describes a successful management of IFS.

Methods: We report a case of a newborn girl who was diagnosed with IFS.

Results: This is a case report of an infant presenting with a right axillary mass at birth, accompanied by mild swelling of the right arm. An MRI revealed a 3.1x3.6x4.4cm mass with perifocal edema. Subsequent diagnostic workup through histology and FISH analysis identified IFS with NTRK3 mutation. Following one cycle of chemotherapy with Vincristine/Cyclophosphamide, we changed the treatment to Larotrectinib at a dosage of 20mg BID 10mg/m2 (following the result of FISH). After only one week of treatment, there was notable shrinkage of the tumor. Three months later, MRI showed significant reduction in size to approximately 1cm, though unfortunately it involved the brachial plexus. Because surgical removal of the mass would be

mutilating for the patient (involvement of brachial plexus), it was decided to continue the treatment with Larotrectinib.

Conclusions: An early and accurate diagnosis, as well as prompt initiation of targeted therapy, is crucial for positive patient outcomes in this rare and aggressive tumor. Given the potential for functional impairment and disfigurement associated with mutilating surgery, targeted therapies such as Larotrectinib should be considered as a first-line treatment option for IFS with NTRK3 mutation.

Soft Tissue Sarcomas

0124: Combined cytotoxic chemotherapy and antiGD2 monoclonal anticlonal antibodies for the treatment of relapsed/refractory bone and soft tissues sarcomas

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Keyword: cytotoxic chemotherapy, antiGD2, monoclonal anticlonal antibodies, relapsed/refractory bone and soft tissues sarcomas.

Objective: More recently, immune response stimulation with monoclonal antibody (MA) targeting GD2 antigen has yielded an increase in survival in high-risk neuroblastoma. We previously reported that the ganglioside GD2 is highly expressed on bone and soft tissue sarcomas cells. We

therefore hypothesized that the antiGD2 MA targets GD2+ relapsed/refractory (R/R) bone and soft tissue sarcomas cells due to antibody-dependent cellular cytotoxicity, complement lysis of cells, and antibody-dependent phagocytosis. The purpose of the study is to assess efficacy, and safety of antiGD2 MA in treatment of relapsed/refractory bone and soft tissue sarcomas.

Methods: A total of ten patients with GD2-positive R/R bone and soft tissue sarcomas had combined therapy (52 exposures); 4 with soft tissue sarcoma (21 exposures), 4 with Ewing sarcoma (19 exposures), and 2 with osteosarcoma (12 exposures). GD2 expression levels on tumor cells ranged from 0.9 to 85%, mean 29 ± 11%. Most patients (90%) received concomitant chemotherapy.

Results: Of the ten evaluable patients, four showed a complete response for 1 to 10 months, three had progressive disease after 2th and 3th cycles of chemoimmunotherapy, and three had stable disease for 2 months after infusion. For the entire cohort, the median overall survival was 7 months from the infusion. A total of 52 cycles experienced 35 adverse events (67.3%). Pain (30.7% of all events), cytokine release syndrome (9.6%), capillary leak syndrome (9.6%), and diarrea (9.6%) occurred most frequently.

Conclusions: Combined infusions of chemotherapy and antiGD2 monoclonal antibodies in targeting GD2-positive R/R bone and soft tissue sarcomas were safe and well tolerated, with no severe adverse events. The targeting of GD2 in malignant cells using monoclonal antibodies may be a feasible approach for the elimination of high GD2 expressing tumor cells. More multicenter clinical trials may be needed to confirm these results.

Soft Tissue Sarcomas

0139: A rare case of pleural sarcoma in children

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Keywords: pleural sarcoma, rare case

Objective: Primary sarcoma of the pleura is an extremely rare entity, especially in the group of children and adolescents. Due to its rarity in this location and variable histogenesis, the diagnosis of sarcoma is a clinical challenge. There are only a few cases in the literature describing this pathology in children. Description of a rare case of pleural sarcoma in a child.

Methods: The thesis presents a case of primary sarcoma in a 5-year-old child. The child was transferred to the RCRC from the city infectious diseases hospital in serious condition. The patient was taken to the clinic by the resuscitation team by ambulance with an endotracheal tube. The severity of the condition was due to shortness of breath associated with compression of the lungs by a tumor in the chest. A CT scan of the chest was performed with intravenous contrast.Conclusion: Compression atelectasis of the upper lobe of the right lung. Right-sided paracostal and interlobar pleurisy. Significant displacement of the mediastinum to the left. Taking into account the severity of the child's condition, after an emergency consultation, the child underwent a thoracotomy, a partial removal of a tumor originating from the pleura. Histological conclusion of the remote formation: Round cell sarcoma. An immunohistochemical study is recommended.

Results: Taking into account the histological conclusion, the child received VI courses of adjuvant polychemotherapy according to the VAC2 scheme + radiation therapy in SOD-30 Gy on the tumor

bed + II course of polychemotherapy according to the VAC2 scheme. At the time of writing, the follow-up period was 6 months, no signs of disease recurrence were detected.

Conclusions: Although IHC could not be performed, histological analysis helped to make a diagnosis in this case and the child received appropriate treatment. IHC should be introduced into the work of the center for the correct choice of treatment tactics.

Supportive Care and Palliative Care

0030: The assessment of the efficacy and safety of the personalized rehabilitation using modern methods and technologies in children with primary immunodeficiencies

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Keywords: Rehabilitation, quality of life, primary immunodeficiencies

Objective: Primary immunodeficiencies (PID) are genetically determined defects of the immune system. Despite significant advances in diagnosis and treatment of this group of disorders, personalized rehabilitation therapy aimed at improving the quality of a patient's life (QOL) is not standardized.

Methods: Our study of the rehabilitation effectiveness in a group of PID patients (n = 78; 59 boys and 19 girls), treated at the Russkoe Pole Rehabilitation Center, demonstrated significant

improvement of the QOL in all aspects.

Results: The total QOL scale score increased from 66.13 to 74.89 points according to a child form and from 65.37 to 70.86 points according to a parent form. The greatest improvement in the QOL was achieved in children under 12 years of age, with an increase in the total scale score from 63.22 to 74.95 points (child form), and from 63.24 to 71.34 points (parent form).

Conclusions: Therefore, personalized rehabilitation therapy can improve the QOL of patients with PID and can be applied in various rehabilitation centers.

Supportive Care and Palliative Care

0083: Establishment of first pediatric palliative care unit in Armenia for children with cancer

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Keywords: Palliative care, pediatric cancer, Armenia

Objective: Every year about 80-100 new cases of pediatric cancer are diagnosed in Armenia with a mortality rate of 20-25%. Before 2021, in Armenia, patients with palliative care needs were deprived of palliative care and mostly died either at home or at intensive care units, without adequate pain relief and other symptom management and often separated from parents and relatives. The need of having a palliative care unit in Armenia was paramount and crucial, hence all necessary measures were contributed to solving this issue. In 2021, through the support of the

“City of Smile Charitable Foundation”, the first and only pediatric palliative care unit was founded in Armenia located at the Pediatric Cancer and Blood Disorders Center of Armenia, Hematology Center after Prof. R. Yeolyan.

Methods: The first pediatric palliative care unit in Armenia was opened on September 28, 2021, at the Hematology Center after Prof. R. Yeolyan. The Pediatric Palliative Care Clinic in Armenia is well-equipped with facilities, including patient rooms, a procedure room, a staff room, a playroom, and a kitchen. The provision of specially adapted bathrooms for patients is also essential in ensuring their comfort and safety. It's commendable that the “City of Smile Foundation” has taken the initiative to equip the clinic with all necessary devices and provide patients with essential medications, meals (4 times/day), and psychosocial support. The mission of the Pediatric Palliative Care Clinic is to provide comprehensive care including physical, sensory, and spiritual care to children with serious illnesses, particularly those whose diseases do not respond to treatment to improve their quality of life and end-of-life care. Pain management is a critical aspect of this care, hence the clinic has access to all registered opioid analgesics, including oral morphine, which is essential for children with intolerable chronic pain. In addition to medication, the clinic also uses integrative pain management methods for children, such as physiotherapy, psychological support, games, and other methods. These methods aim to provide holistic care and improve the quality of life for patients and their families. By addressing not only physical pain but also emotional and psychological needs, the clinic helps children and their families cope with the challenges of living with a serious illness.

Results: In the Pediatric Palliative Care Clinic, around 18 children have been provided with palliative care. The involvement of the palliative care team in the treatment process, including pain and symptom management, is essential in ensuring that children with serious illnesses receive the care they need to improve their quality of life.

Effective teamwork is crucial in providing high-quality palliative care, and the palliative care team works together efficiently to address all the challenges that arise during their work. The successful coordination of the team allows for a more comprehensive approach to care, which is especially important in pediatric palliative care.

Conclusions: Pediatric Palliative Care Clinic ensures that no child suffering from pediatric cancer and blood disorders will be left without care. This clinic provides a much-needed service for children and families who are dealing with serious illnesses that require palliative care.

Supportive Care and Palliative Care

0084: Feasibility of an oral supportive care regimen during high-dose methotrexate administration in children with hematolymphoid malignancies

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Keywords: supportive care, high-dose methotrexate, hematolymphoid malignancies

Objective: Administration of high-dose methotrexate(HDMTX) requires strict intravenous hydration, urine alkalinization, and timely leucovorin(LV) rescue thereby contributing to significant length of hospital stays. An oral supportive care regimen(OSCR) after ensuring satisfactory methotrexate clearance can cut short the length of hospital stay required for safe administration of HDMTX and allow optimal health care resource utilization in developing nations. The aim of the study is to test the feasibility of an OSCR in the in-hospital setting during HDMTX administration. The primary objective is to identify the proportion of HDMTX courses completed on OSCR in children started on OSCR after documentation of an initial safe serum methotrexate level.

Methods: Children with hematolymphoid malignancies aged 5-18 years, that received high dose methotrexate with initial intravenous alkaline hydration and have a safe initial methotrexate level were started on OSCR including oral hydration, oral bicarbonate and oral LV after the family was counseled regarding need for strict compliance. Oral fluid intake and urine output were documented in monitoring sheets by parents. Inpatient monitoring to ensure adherence to the OSCR was done periodically by the nursing team. Children were changed to the intravenous supportive care regimen if pre-defined withdrawal criteria were met, to ensure safety.

Results: OSCR was tested in a total of 20 HDMTX courses, involving 12 children. OSCR was completed in 18 of the 20 HDMTX courses. 2 courses had to be withdrawn from OSCR and started on the intravenous regimen due to requirement of more than 2 oral bolus doses of bicarbonate for maintaining urine pH. All but the 2 withdrawn courses had a safe second methotrexate level. The mean adherence rate to oral fluid intake was 96% among the courses that completed OSCR. No grade 3/4 adverse events were noted.

Conclusions: OSCR in the inpatient setting is safe and feasible during HDMTX administration in children with hematolymphoid malignancies.

Supportive Care and Palliative Care

0085: Outcomes in febrile neutropenia children managed on outpatient basis at a tertiary care centre

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Keywords: febrile neutropenia, antibiotics, hematological malignancies

Objective: Febrile Neutropenia (FN) cases are a significant burden on hospitalization & supportive care services, especially when beds are at a premium, necessitating their management on an ambulatory basis. Aim: To evaluate outcome of children with FN treated on ambulatory antibiotics (AA) over 9-months (October 2021 – June 2022).

Methods: Patients with FN receive antibiotics in daycare and are assessed twice a day. Children presenting with hemodynamic compromise/unwell on assessment are not managed on AA. Clinical and laboratory details of patients were retrieved from the daycare records.

Results: Analysis included 474 episodes of FN including hematological malignancies (76.8%), solid tumors (15.4%) and aplastic anemia (7.8%). Hematological malignancies: ALL - 13.7%, 46.4% and 6.75% episodes of FN during induction; other intensive phases and maintenance phase of therapy; AML- 6.1%; NHL- 3.8% cases. Only 79 episodes (16.6%) had an identifiable focus. Fifty five percent episodes had severe neutropenia (ANC100l Only 16 episodes (3.3%) had a positive culture with eleven (69%) having an ANC 100/µl. Children who had fever for more than 72-96 hours, had culture positivity or were subjectively unwell at any time were admitted. Only 28% (73) episodes

of FN with ANC 100/µl required admission. Three fourth episodes (74.2%) were treated successfully on an ambulatory basis while 122 (25.8%) required admission. The mean duration of parenteral antibiotics was 3.04 days and time to defervescence of fever was 2.43 days in the 352 episodes treated successfully on day care basis.

Conclusions: Majority of patients with FN can safely be treated with AA with regular monitoring, reducing cost and nosocomial infections and improving quality of life. Only 28% of episodes with profound neutropenia required admission. Possibly most fevers are viral in origin and oral antibiotics may be considered in those who are well at presentation and do not have profound neutropenia.

Supportive Care and Palliative Care

0089: Thrombophilic complications in patients with undifferentiated nasopharyngeal cancer

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Keywords: nasopharyngeal cancer, children, thrombophilia

Objective: Children with undifferentiated nasopharyngeal cancer have risk factors for the development of thrombophilic complications associated both with the tumor process itself and with the coagulation system. The aim of the study is to report the results of treatment of children with undifferentiated nasopharyngeal cancer who developed thrombophilic complications.

Methods: The study includes 12 patients aged 9 to 17 years, diagnosed with undifferentiated nasopharyngeal cancer, who received special treatment from 2017 to 2023. In the study predominated male patients - 9 (75%). Drug treatment according to the protocols approved by the N.N. Blokhin National Medical Research Center of Oncology received 12 (100%) patients. Radiation therapy was carried out in 11 patients (92%), SOD 55.2 Gy was applied to the primary tumor, SOD 45.6 Gy to the lymph nodes. All patients underwent a genetic study of mutations in the coagulation system.

Results: In 7 (59%) patients, thrombophilic complications developed at different stages of treatment. In four cases (57%), thrombosis of the internal jugular and subclavian veins developed, in one case (14%) - thrombosis of the axillary vein. According to the results of genetic analysis, in 6 cases (86%), a violation of folate metabolism was detected, a decrease in fibrinolytic activity in 5 (72%), a decrease in factor VII gene expression, a decrease in factor XIII - 2 (29%). A patient who developed an ischemic stroke was found to have a mutation in the F5 (Factor V Leiden) gene - congenital thrombophilia.

Conclusions: The risk of developing thrombophilic complications in children with undifferentiated nasopharyngeal cancer depends on the presence of genetic changes in the coagulation system, tumor localization, and may be associated with the effects of drug and radiation therapy, leading to disturbances in the coagulation system.

Supportive Care and Palliative Care

0099: The outcome of children with chemotherapy induced fever and leukopenia: results from a single center

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Keywords: chemotherapy, febrile neutropenia, antibiotics, children

Objective: Patients with febrile neutropenia with high risk of complications should be initiated with empiric antibiotics administered intravenously in the hospital setting. Analyzing the information obtained from this management helps to improve the guidelines for the management of febrile neutropenia.

Methods: This retrospective cohort study was conducted on the case of cancer children with fever and neutropenia caused by chemotherapy who were admitted to the tertiary oncology center during the last 10 years. Only patients with an initial leukocyte count less than 4,000/µl were included. All enrolled patients were divided into a low versus high-risk group. Then, initial leukocyte count, empiric antibiotics, age at the event, sex, need to change for the empiric antibiotics, pediatric intensive care unit (PICU) admission, and outcome of all of them were recorded.

Results: 284 patients with fever and leukopenia were included (162 patients in low-risk group and 122 patients in high-risk group). There wasn't a statistically significant difference between the two groups in terms of age and sex distribution; however, the leukocyte count was significantly lower in the high-risk group (P=0.001). The combination of Ceftazidime plus amikacin was the most common empiric antibiotic in our center. The frequency of death, antibiotic change, and

admission to the PICU were significantly higher in the high-risk group (P=0.0001). Initial leukocytes count less than 1,500/µl, PICU admission and high-risk group were three independent poor prognostic factors.

Conclusions: Empirical selection of antibiotics is very important in the management of children with fever and leukopenia caused by chemotherapy. We recommend using the combination of the most broad-spectrum available and appropriate antibiotics as empirical therapy if there are each of mentioned independent poor prognostic factors. However, a prospective experimental study is needed to confirm the results.

Supportive Care and Palliative Care

0101: Assessing the need for home-based palliative care in pediatric cancer care

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Keywords: palliative care, pediatric oncology, home care, end-of-life support

Objective: Home-based palliative care provides the basic needs of palliation within the comfort of the patient's home. In pediatric cancer care, end-of-life care is offered mainly in palliative care centers or hospitals. Even when a facility for palliative care centers is available, many families opt to return home.

Methods: We analyzed the location of the end-of-life of children 0-18 years who died following a diagnosis of cancer between January 2019 to March 2023. Death from disease progression,

toxicity or other causes was included. Hospital records (in/outpatient) were examined and families interviewed to understand the reasons for the decision. We provide palliative care through a stand-alone palliative centre run by CanKids, an NGO.

Results: 77 children fulfilled the inclusion criteria. M:F ratio was 1.3:1. Median age of this cohort was 7 years (0.4 -18 years). Of these, 32 deaths occurred while the child was being treated with a curative intent (either toxic deaths or infection-related deaths) Infection-related deaths were classified as those that occurred while in remission and were not related to neutropenic infections. 4 children died at home due to unexpected causes. Of the rest (n=41), families were counseled for relapse or progressive disease and options for palliative care were provided. Only 3 of these families (7.3%) opted for a formal palliative care center. 15 remained in the hospital for end-of-life treatment and the remaining 23 patients (56%) went home. Although formal palliative care options were not available near home, most families still wished to be at home during the final days. They were provided pain medicines with an option to return to the hospital when needed.

Conclusions: Integrating home-based palliation is vital to providing end-of-life care for children. Parents should not be burdened with the logistics of providing end-of-life care while going through this emotionally taxing period.

Supportive Care and Palliative Care

0102: Experience of longitudinal assessment of standardized complementary feeding practices in children undergoing cancer treatment

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Keywords: cancer treatment, malnutrition, nutritional counseling, complementary feeding practices

Objective: Children undergoing cancer treatment are at high risk of malnutrition due to increased nutrient demands. Timely assessment of anthropometric data can provide a better picture of malnutrition and guide the implementation of complementary feeding practices. To evaluate the impact of standardized nutritional packages and nutritional counselling on the nutritional status of children undergoing cancer treatment.

Methods: The study involved 85 cancer patients aged 2-17 years who were monitored for 10 months using anthropometric measurements. The intervention included standardized nutritional packages and counselling, with four types of packages provided based on the patient's grade of malnutrition. Packages included high-calorie, high-protein supplements and gluten- and lactose-free formulas.

Results: Before the intervention, approximately 50% of patients were malnourished. After 10 months, body weight increased by 21%, height increased by 7%, MUAC increased by approximately 6%, and BMI improved by 26%. The proportion of severely acute and moderately acute malnourished patients reduced from 25% and 25% to 22% and 20%, respectively. The

overall acceptance was better towards the high-calorie high protein food items rather than the supplementations. Further, there was behavior modification in the caregivers in selecting the food items for children, due to increased awareness about locally available high-calorie high protein food items.

Conclusion: This study showed that standardized packages, nutritional counseling, and timely assessment of anthropometric measures can effectively improve the nutritional status of malnourished children undergoing cancer treatment. While the results are promising, the study was limited by the loss of follow-up.

Supportive Care and Palliative Care

0103: A randomised trial of effectiveness of a commercial RUTF with indigenous millet-based supplementary feeding vs. commercial supplement in promoting weight gain in pediatric cancer patients

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Keywords: pediatric oncology, malnutrition, RUTF, millet-based supplementary feeding

Objective: One of the main challenges in childhood cancer in LMICs is malnutrition. Nutritional interventions such as ready-to-use food (RUTF) and commercial supplements are commonly used to improve weight gain, but their effectiveness and acceptance in this population are not well-

known. Economic feasibility and cultural acceptance of these agents also vary. This study compared a high-calorie, high-protein diet with RUTF along with millet-based RUSF (Ready-to-use Supplementary Food) with commercial food supplements in promoting weight gain. The study measured the percentage weight gain in both groups and assessed the difference in patient acceptance.

Methods: The study analysed 12 pediatric oncology patients (8 males, 4 females) with ALL, AML, and Burkitt's lymphoma. Group 1 (50% of patients) received a high-calorie, high-protein diet with RUTF and millets RUSF and group 2 received commercial supplements in addition to the normal diet received in the hospital/ home. Weekly weight checks and acceptance evaluations were conducted. Statistical analysis compared weight gain and acceptance between groups.

Results: All patients were on an oral diet. The average follow-up time in (group 2) was 9.5 and in group 1 was 4 months. At baseline, one child had severe, 5 had moderate and 2 had mild malnutrition. Children aged between 6-13 years. In group 1, the mean percentage of weight gain was 6.8%, while in patients on commercial supplements, the mean weight reduced by -2.87kg and a percentage gain of 0.4% was observed only by 9 months. Patient acceptance was significantly higher in the natural diet with RUTF/RUSF group than in the other group.

Conclusions: Addition of millet RUSF to high-calorie, high-protein diets in an effective strategy to improve nutritional status in pediatric oncology patients. It is well-accepted culturally and can ensure weight gain while on an oral diet without the need for nasogastric/parenteral nutrition.

Supportive Care and Palliative Care

0105: Long-term nutritional concerns in childhood cancer survivors

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Keywords: childhood cancer survivors, nutritional concerns, dietary habits, metabolic diseases, nutritional assessment

Objective: The long-term health outcomes of childhood cancer survivors are often affected due to nutritional concerns. Dietary habits are a major contributor to metabolic diseases leading to adverse cardiac outcomes. In the present study, we evaluated the nutritional status, dietary habits, and addiction of childhood cancer survivors at our centre.

Methods: A prospective study was conducted in our department between September 2021 to March 2022. Children who have completed 5 years from their diagnosis of cancer and are in remission were included. Nutritional assessment of these children along with a survey of dietary practices and addictions were assessed. Dietary diversity was assessed from a 24-hour dietary recall. The food intake data of the subjects were collected by individual single 24-h food recall by a trained dietician using a standard protocol.

Results: We evaluated 45 survivors who were consecutively followed up in our survivor clinic. M: F ratio 2.5:1. The median age was 11.5 years (range 6.6-25.2 years). The median follow-up was 84.55 months (64-112 months range). The primary diagnosis was ALL in 34 (76%), AML in 2 (4%), Hodgkin lymphoma in 4 (10%), NHL in 1 (2%), 2 LCH, 1 neuroblastoma, and 1 Wilms tumour. >50% belonged to the middle and lower social strata. In anthropometry, a normal BMI (18.5-24.5) was

observed in 19 / 45 survivors (42.2%). 9/45 (20%) were overweight and one was in the obese range. 35% were undernourished. 8 children were above 2SD for weight for age. 2 children were stunting. The average dietary diversity score was 7.8 on working days and 7.55 on holidays.
Conclusions: In our series of childhood cancer survivors, both over and underweight were recognized. A lack of dietary diversity was observed in the majority despite being on an unrestricted diet. Focus on dietary intervention in survivors can help reduce metabolic syndrome in the future.

Supportive Care and Palliative Care

0143: Understanding caregivers needs during palliative care

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Keywords: palliative care, childhood cancer, Pakistan

Objective: Only 50 % of the 8000 Pakistani children with cancer (Ashraf 2012) are properly diagnosed and treated, and 40% of those come to a medical facility with advanced disease (Shabbir 2011). Most Parents go through difficult times during their children's treatment and after their dismissal and have difficulties in the bereavement phase. Healthcare workers also suffer from compassion fatigue due to lack of support and understanding.
Methods: A project was conducted with the help of My Child Matters grant where to highlight the needs of caregivers during their children's/patient's palliative care. A video was made with consent of Bereaved parents/Healthcare workers were interviewed with loose ended questions.

Results: Video was developed of short clips from parent and health care workers involved in taking care of palliative care children. The video had few very specific needs and feelings that were identified by bereaved parents like by one parent saying that sometimes "too much positivity is Toxic", and relatives should be just supportive and understanding. For healthcare workers mentioned it is as difficult for them to lose a child as parents because they start seeing them as their own because of bonding. The Script has open-ended broad questions and will have an ending message of how to take care of yourself while caring for loved ones. this also helped in identification of needs for parents that could be useful for health care provider.

Conclusions: The video is circulated by a link to all hospitals in Pakistan, this video had over 2k views. This is a resource that can be used in all teaching learning activities throughout Pakistan and other countries for people trying to understand the needs of Families and Caregivers. It also has suggestions for coping with compassion fatigue.

Supportive Care and Palliative Care

0147: Family/replacement and voluntary blood donation in Armenia, 2022: a single-institution report

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Keywords: blood donation, blood bank, childhood cancer

Objective: The blood donors category is divided into three groups: voluntary/non-remunerated, paid/commercial, and family/replacement donors. Family/replacement and voluntary donors have a significant role in replenishing blood reserves. In Armenia, paid donors still predominate, and voluntary non-remunerated donors comprise the lowest percentage. This study aimed to explore family/replacement and voluntary donors in Armenia.

Methods: The basis of all statistical information is the data available in the Blood Bank of Hematology Center after Prof. R.H. Yeolyan representing the central blood bank in Armenia, where 2/3 of all the donated blood is. A retrospective review of blood donors' medical cards was conducted from January 2022 to December 2022.

Results: During the mentioned period of time, the number of blood donations was 8272. Among them, the family/replacement donors were 2433 (29.4%), and the voluntary ones were 674 (8.15%). It should be noted that the family/replacement donors who gave blood when it is

required for the treatment of children with hematological and oncological malignancies and for adults with cancer were 1399 (16.9%) and 1034 (12.5%), respectively. In 2022 one of the factors influencing the rate of voluntary blood donation was the geopolitical situation. During the September military escalation between Armenia and Azerbaijan, the number of voluntary donors started increasing.

Conclusions: In Armenia, family/replacement donors provide about 30% of all the blood collected. Even though the incidence of cancer diseases in the pediatric population is about seven times less than in the adult population, family/replacement donation in pediatric oncology is predominant. A unique blood donation program should be developed in order to increase the percentage of voluntary unpaid donors, which is still less than 10%.

Surgery

0086: Transnasal endoscopic surgery in the complex treatment of children with parameningeal localization rhabdomyosarcoma

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Keywords: rhabdomyosarcoma, transnasal endoscopic surgery, multidisciplinary team

Objective: Malignant tumors of parameningeal localization are tumors of different morphology. Rhabdomyosarcoma is the most common type of soft tissue sarcoma. The incidence rate of rhabdomyosarcoma is 0.9 per 100,000 children. The anatomically complex structure of the skull structures in children leads to the impossibility of adequate surgical treatment of parameningeal rhabdomyosarcoma, which emphasizes the importance of transnasal endoscopic surgery. The aim of the study is to show the possibilities of transnasal endoscopic surgery in the treatment of children with parameningeal rhabdomyosarcoma.

Methods: The study included 36 patients aged 9 months to 14 years, diagnosed with parameningeal rhabdomyosarcoma, who received special treatment from 2017 to 2022. In the study predominated male patients - 20 (56%). All the patients received drug treatment according to the protocols approved by the N.N. Blokhin National Medical Research Center of Oncology.

Results: During the observation period from 1 month to 5 years, 25 (68%) patients are alive. 9 (26%) died from tumor progression, 1 (3%) died from complications of special treatment. 1 (3%) patient left the study.

Conclusions: The method of transnasal endoscopic surgery is becoming increasingly popular in the treatment of children with rhabdomyosarcoma of parameningeal localization, due to the achievement of complete visual control of the manipulations performed, the radicalness of the intervention with maximum preservation of anatomical structures with minimal trauma. Endoscopic transnasal surgery in children with parameningeal rhabdomyosarcoma is evolving through multidisciplinary team approaches and constant innovations.

Surgery

0087: Possibility of gastro/pancreaticoduodenal resection in children with pancreatic tumors

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Keywords: pancreatic tumors, children, gastropancreaticoduodenal resection

Objective: The article is devoted to the experience of treating children with pancreatic tumors who underwent gastropancreaticoduodenal resection (GPDR) and pancreaticoduodenal resection (PDR) at the N.N. Blokhin National Medical Research Center of Oncology. This kind of surgical intervention is performed in local neoplasms of the head of the pancreas, as well as with the spread of the tumor process to the duodenum, distal part of the stomach, parapancreatic fiber.

Methods: For the period from 2010 to 2022, 13 surgical interventions were performed in the amount of GPDR and PDR in children aged 5 to 16 years. The results of these patients were assessed as satisfactory, despite the complications that occurred in some patients in the early and late postoperative period. All patients are alive. Operations in the volume of GPDR were performed in 6 patients, PDR - in 7 patients. The most often verified solid pseudopapillary tumor of the head of the pancreas in 10 cases, in 2 cases - neuroendocrine tumor and one case of paraganglioma.

Results: Early postoperative complications included bleeding from the pancreatic branch of the splenic artery and acute pancreatitis. In the late period after the operation, a recurrent phenomenon of enzyme evasion, SIBR, was detected.

Conclusions: Despite the complications that occurred, all patients are alive without signs of recurrence of the disease. The prognosis in this category of patients, with a radical surgical intervention, is favorable.

Surgery

0094: Causes of late diagnosis of thyroid cancer in children

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Keywords: thyroid cancer, delayed diagnosis, children

Objective: The incidence of nodular goiter and thyroid cancer (TC) in children has increased in recent decades. The annual increase in the incidence of TC varies from 2 to 12%. The complexity of diagnosing TC and its aggressive nature also cause late detection of tumors with a widespread metastatic process in the lymph nodes of the neck.

Methods: 96 patients were operated on in 2017-2019. A local process (N0-x-N1a) was detected in 73 patients (76%), spread of metastases to the lateral triangles lymph nodes of the neck (N1b) was detected in 23 patients (24%).

Results: The timing of diagnosis in patients with widespread metastasis to the lymph nodes of the neck from the moment of detection of nodular goiter to surgical intervention was: up to 1 month - in 5 (22%) patients, from 1 to 3 months - in 5 (22%), from 3 to 6 months - 4 (17%), from 6 months and more - 9 (39%) patients. Among the reasons for late diagnosis, we noted: accidental detection at a later date - 8 patients (35%), long-term diagnosis - 14 patients (61%), other reasons - 1 patient (4%)- non-compliance with the recommendations of the patient's parents. Reasons for long-term

diagnosis: imperfection of the cytological method - 8 patients (57%), late Fine-needle aspiration (FNA) - 6 patients (43%).

Conclusions: Possible solution to the problem is: Informing first contact physicians about the likelihood of detecting TC in children from known risk groups. Statement of indications for FNA with nodes less than 1 cm in case of a suspicious ultrasound picture and / or the patient's attitude to the risk group for the occurrence of TC. Timely surgical treatment based on the adaptation of the TIRADS and Bethesda classification to the childhood age of patients (revision of the percentage of TC detected in each of the diagnostic groups). Improving the cytological method of research, including using genetic methods (determination of point mutations and oncogenic rearrangements in the material, which determine an increased risk of detecting carcinoma in children), liquid cytology and analysis of biochemical parameters in punctate.

Surgery

0096: Diode laser for nevi in children and adolescents

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Keywords: nevus, laser treatment, children, adolescent

Objective: Nevi are characterized as benign, often pigmented, skin growths. Today laser treatment has been proven to be an effective therapy for nevi in adults but there is controversy about the therapy in children. Purpose. To assess the efficacy of the 810 nm wavelength laser in the treatment of melanocytic nevi.

Methods: Forty-six patients, age range 7 to 17 years exhibiting melanocytic nevi participated in this trial. Patients were those with relatively small lesions (mean surface area 352 mm2, range 50-1012 mm2). A long pulsed 810 nm diode laser (ALPH - 01 - Diolan", "LAHTA - MILONTM) was used only once without interval. All patients were treated with energies at 6,25 – 7,5 J/cm2 was observed. The laser coagulation was completed in 1-5 minutes (mean 2,6 minutes). All nevi were biopsied before or during treatment. All 46 biopsies were studied.

Results: At 6 months' follow-up, all of the sites remained in remission. No child has relapsed. Histology consistently showed sparse epithelial cells with areas of coagulation of intimal tissue together with a small amount of carbonization. Coagulative damage was limited to the derma. Histological picture of the nevi corresponded to the specifics of the age period of nevogenesis and was benign in 100% of cases.

Conclusions: The 810 nm diode laser may represent an effective, fast and safe treatment modality for melanocytic nevi. Reluctance associated with using lasers for the treatment of nevi in children is largely attributed to the myth of complications risk, such as hypopigmentation, and nevus recurrences and malignancy. But a diode laser has some advantages, such as a highly informative, age-adapted method available for use in everyday practice without using general anesthesia.

Surgery

0155: Surgical treatment of Bone Tumors in children

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Objective: The treatment of children and adolescents with Bone Tumors is an important problem of contemporary oncology. Our aim is to summarize the experience of treating children with Bone Tumors.

Methods: In the period from 2014 to 2022, 154 patients with Bone Tumors have been treated at the Service of Orthopedic Oncology at the Nairi Medical Center. According to the histological form, the patients were distributed as follows: osteoid-osteoma – 28, osteochondroma - 24 cases, aneurysmal bone cyst (ABC) - 16 cases, osteoblastoclastoma – 6, chondroma - 24, unicameral bone cyst - 18, non-ossifying fibroma – 7, osteosarcoma – 18, Ewing sarcoma – 4, fibrous dysplasia – 6, chondroblastoma – 3 cases. In the case of benign Bone Tumors, marginal or intra-focal bone resections were performed with replacement of the bone defects with auto- or hydroxyapatite grafting. In malignant bone as a general rule segmental resection of the affected area of the bone was performed, replacing the defect by individual prosthesis. Humeral resection with shoulder joint resection with prosthetic replacement was performed in 6 cases. Twelve patients underwent resection of the distal femur and/or proximal tibia with individual prosthetic replacement of knee joint. Three thigh and 1 leg amputations were performed because of a locally advanced tumor (osteosarcoma – 3, Ewing sarcoma – 1 case).

Results: There was one case of local recurrence in ABC of the humerus and one case of femur fracture in the place of bone resection for osteoid-osteoma (immediate plating with healing). In case of bone sarcomas, we did not observe a local relapse in a period from one to 9 years. In all cases good and excellent functional results were achieved.

Conclusions: Adequate surgical treatment of patients with a combination of oncological radicality and use of orthopedic reconstructive technologies for replacement of the resulting defects allows to maintain a functioning limb in children with Bone Tumors.

Tumor Biology, Immunology and Immunotherapy

0088: Outcome of melanoma in children and adolescents: analysis of 43 cases in a single cancer center in China

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Keywords: melanoma, BRAF V600 gene mutation, children, PD-L1 expression

Objective: Malignant melanoma in children and adolescents is rare， with limited data on Asian populations.

Methods: A retrospective review was undertaken to identify the survival and prognosis of pediatric malignant melanoma treated in Sun Yat-sen university cancer center from 2005 to 2021.

In addition, frequency of BRAF V600 gene mutation, expression of PD-L1 and mismatch repair protein of melanoma were analyzed.

Results: Forty-three patients were enrolled, with median age of 138.9 months (13.1-215.0 months), including 30 cutaneous melanoma, 7 meningeal melanoma, 5 mucosal melanoma (4 located at conjunctiva, 1 located at ovary), and 1 uveal melanoma. The frequency of BRAF V600 mutation was 16.7% (4/24). All four MMR proteins were positively expressed (7/7), and the positive rate of PD-L1 expression was 33.3% (3/9). The EFS and OS of cutaneous, mucosal and meningeal melanoma were 46.7±9.1% vs 75.0±21.7% vs 16.7±15.2%, (P=0.010), 65.5±8.9% vs 75.0±21.7% vs 16.7±15. 2% （P＜0.001), respectively. Survival of cutaneous melanoma was associated with pathological type, ulceration, clerk level, disease spread, sentinel lymph node status, stage and Ki67. Five of 9 patients (7 cutaneous melanomas, 2 meningeal melanoma) who treated with checkpoint inhibitors (5 PD1 antibody alone, 4 combined with antiangiogenic inhibitors, 1 combination with chemotherapy) had evaluable lesions: 1 patient received PD1 antibody combined with antiangiogenic inhibitor achieved CR, 4 patients achieved PD, the overall response rate was 20%. The most common side effect of immunotherapy is hypothyroidism.

Conclusions: The prognosis of mucosal melanoma is good, followed by cutaneous melanoma, that of meningeal melanoma is the worst. The frequency of BRAF V600 mutation is low. Immunotherapy alone has limited efficacy in pediatric melanoma, combined with antiangiogenic inhibitors is a promising option and is well tolerable.

Psychosocial

0048: Features of parental attitude to the child in the case of cancer (by the example of mothers)

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Keywords: pediatric cancer, parental attitude, psychosocial support

Objective: A childhood cancer diagnosis is a traumatic reality for both the child and the parent. In different stages of the disease, the support of the family, which is also in a difficult psychological state, is very important. It is necessary to highlight the key issues and difficulties that parents of children with cancer face during treatment. The purpose of our research is to study the emotional state and parenting characteristics of mothers in case of child cancer.

Methods: Mothers' emotional state in the presence of child cancer is characterized by high levels of anxiety, hopelessness, and guilt, which correlates with controlling and symbiotic parenting. We used Beck's "despair" questionnaire, Stolin's "Parental Attitudes" test-questionnaire, Eidemiller's "Family Anxiety Analysis" questionnaire, and Munz's "Guilt Index" test-questionnaire. The study was conducted with 50 mothers, 25 mothers of children with cancer, and 25 healthy.

Results: Summing up and based on the results of the research, we can say that the emotional state of mothers in the presence of a child's cancer is characterized by a high level of anxiety, despair and guilt, which is correlated with controlling and symbiotic parental attitudes. Symbiotic parenting is associated with family stigma and guilt. As for the controlling parental attitude, here we notice a correlation only with family anxiety.

Conclusions: In the case of a child's cancer, mothers have a low degree of despair, which proves that they have positive expectations about the future. It was also clear from the research that symbiotic, controlling parental attitudes have high rates in the experimental group. The level of family anxiety and worry was also high in the experimental group. Summarizing the results of the conclusion, we can say that symbiotic parental attitude is only associated with family anxiety and guilt, and controlling parental attitude is correlated only with family anxiety.

Psychosocial

0049: "My child has cancer: what am I facing and how do i cope?" a qualitative systematic review of strains faced by parents, and coping behaviors

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Keywords: coping, cancer, children

Objective: Cancer is a leading cause of childhood mortality worldwide. When a child is diagnosed with cancer, parents experience anxiety and distress related to the diagnosis, treatment plans and procedures. A progressing body of research explored the experience of parents when a child is diagnosed with cancer. Until recently, one qualitative review has been conducted to explore the experiences of parents, but none was done to review strains and stressors faced by parents and parental coping with cancer. The aim of this systematic review is to summarize the findings from qualitative studies on the strains and stressors associated with childhood cancer and the coping mechanisms used by parents.

Methods: Search for qualitative studies published in English between 2007 and 2022 exploring parental coping with childhood cancer was conducted using the following databases: PubMed, MEDLINE and CINHAL. Quantitative studies, systematic reviews, longitudinal studies, and papers exploring parental coping with other chronic diseases were excluded. Similarly, studies exploring the parent's response to death caused by cancer or parents coping with cancer compared with other diseases were excluded. Twelve qualitative studies are included in the review. The quality of the studies assessed by Critical Appraisal Skills Programme (CASP) data was analyzed by thematic synthesis approach and prominent themes were identified.

Results: This review provides information about the factors helping parents to cope with the experience and those that cause distress. It revealed different coping strategies employed by parents which can be appraisal-focused behaviours, problem-focused behaviours or emotion-focused behaviours.

Conclusions: Health care providers must learn how different parents cope to provide efficient and holistic care. This paper was based on work undertaken as part of the requirements for the MSc in Advanced Practice in Health Care in the University of Glasgow. I am grateful to my supervisor, my husband and my family for the continuous support and guidance.

Psychosocial

0100: Investigating the efficiency of cognitive-behavioral stress management therapy on depression and mental fatigue of mothers whose child is a cancer survivor

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Keywords: depression, mental fatigue, cancer survivor

Objective: The present study was performed to evaluate the effectiveness of cognitive-behavioral stress management therapy on mental fatigue and depression of mothers whose child has completed cancer treatment.

Methods: The study used a quasi-experimental pretest-posttest method with a control group. The independent variable was cognitive-behavioral stress management therapy and the dependent variable was depression and mental fatigue. For this purpose, from among the volunteer applicants for the counseling program, 30 mothers, whose children had previously been admitted at MAHAK hospital for cancer and successfully completed their treatment, were chosen. They were non-randomly divided into two experimental and control groups. In advance to any therapeutic interventions, both groups of control and experimental were evaluated with the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) test hence, this psychometric test was used as the data collection tool. The members of the experimental group attended four private 90-minute counseling sessions on cognitive and behavioral stress management. These sessions were implemented in a codified manner over a period of 2 months while the control group did not

receive any formal psychological intervention for this period of time. At the end of the intervention period, both groups were reevaluated with MMPI-2 test and the collected data were analyzed using SPSS-16 software to perform the analysis of covariance statistical test.

Results: As expected, the results of this survey were positive and the experimental group performed the efficiency of cognitive-behavioral stress management therapy on depression and mental fatigue of mothers whose child is a cancer survivor.

Conclusions: The results indicate a significant difference in the rate of depression and mental fatigue between the two groups in favor of the experimental group ($p > 0.001$), and show that cognitive-behavioral stress management therapy can reduce depression and mental fatigue in mothers of children who successfully completed their cancer treatment.

Psychosocial

0104: Formal and non-formal education during and after cancer treatment

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Keywords: childhood cancer treatment, non-formal education, school reentry

Objective: The continuity of academics through the period of cancer treatment and reentry into school are challenges for children. There are families who do not restart schooling after the completion of cancer treatment. We describe our experience of providing non-formal education during the period of cancer treatment and assistance for formal education during and after completion of treatment.

Methods: Data was collected prospectively between 1 April 2019 to 1 February 2023 (38 months) in the playroom of the pediatric cancer ward was evaluated. Play room was managed by a teacher (CanKids) with assistance for art therapy from volunteers periodically. Activities were categorised into formal and informal as well as daily, weekly, monthly and occasionally.

Results: During the study period, 679 children with cancer were registered at the centre. Non-formal education was imparted to admitted children daily. This constituted a 'topic-based' syllabus for children aged 3 to 14 which covered WASH-C, theatre, speech and vocabulary, and general knowledge. The learning activities also included therapeutic education; yoga, meditation, sports and dance as well as DIY arts and crafts kits which were theme based on and included festivals, national holidays and health-based themes. From Jan 2022, a storytelling activity was initiated fortnightly where children's book authors were encouraged. Children were encouraged to join schools as soon as the intensive treatment was over. Board examinations were not missed for any child. Financial support for formal education was provided for 208 patients. Tablet computers were provided to 35 children. None of the children we supported dropped out of school.

Conclusions: Continuation of formal and non-formal education during cancer treatment has psychological and academic benefits. Return to school after cancer treatment should be encouraged for early social integration.

Psychosocial

0135: Expectations of parents having children with newly diagnosed cancer

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Keywords: children, cancer

Objective: At the time of diagnosis, parents of children with cancer can have different expectations regarding diagnosis, treatment tolerance and prognosis. It is important for health care professionals to understand what parents expect, in order to support them in a better way. The purpose of this pilot study is to describe the expectations of parents having children with newly diagnosed cancer.

Methods: This is a prospective observational pilot study conducted at a paediatric oncology division of a tertiary cancer centre. A group of experts and parents of childhood cancer survivors decided the dimensions of the construct and questionnaire format was selected. A questionnaire with 20 questions covering 5 domains (Treatment and Prognosis, Financial support, Facility support, Psychosocial support, Spiritual support) was selected from the pool. The questions were framed in a positive manner and responses in Likert scale (More likely, Likely, Less likely and Unlikely).

Results: Questionnaire was administered in 30 parents with median age of the parent and their children were 35 and 4 years respectively. Gender ratio among parents enrolled in study was 50% (n=15) and 66.7 % (n=20) parents were either diploma holders or graduates. Completion rate of the questionnaire was 97.7% and no parent reported any difficulty in filling the questionnaire.

Most parents had positive expectations in all domains except financial domain, with 56.7 % (n=17) parents had negative expectations regarding job security during treatment. All the mothers who participated in the study were homemakers and they had more negative expectations regarding the family income compared to fathers. Positive expectation of 100% was seen with curability of cancer, long term effects of treatment, symptom relief with treatment and communication by health care workers.

Conclusions: Parental expectations should be addressed at the time of diagnosis of cancer to identify their concerns.

Psychosocial

0136: Emotional distress in pediatric cancer and their siblings

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Keywords: Emotional distress, pediatric cancer, siblings,

Objective: Cancer being a serious chronic illness, causes profound effects on physical and mental health of the individual as well as affects their caregivers and family members' mental health. This study aims to find out the burden of emotional distress in patients of childhood cancer as well as their healthy siblings.

Methods: It was a descriptive cross sectional study. Parents of the children undergoing cancer treatment or having completed treatment within the past one year were asked to complete an interview proforma (Pediatric Emotional Distress Scale) about their child's behaviour over the past

one month, scoring each behaviour on a scale of 1 to 5 according to the frequency of symptoms. The data was then analysed using SPSS 20.

Results: Almost 85% of the patients showed scores above the clinical threshold for emotional distress. 18% of the healthy siblings also had scores above the clinical threshold. Patients as well as their healthy siblings showed high levels of anxiousness in their behaviours.

Conclusions: Childhood cancer continues to be a cause of major emotional trauma in patients long time after being cured14. Age-matched healthy siblings usually cope well emotionally with the disease. This study again emphasizes upon the role of good psychosocial support for childhood cancer patients and their families13.

Psychosocial

0137: Sociological view on specifices of losses in families with cancer children in the period of antitumor treatment

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Keywords: Sociological view, cancer children, antitumor treatment

Objective: A life-threatening disease and severe treatment in a child is accompanied by significant losses for all family members that trigger the process of grieving with its inherent stages and dynamics. At the same time, psychological support for family members is extremely limited in

cancer clinics. The purpose is to conduct a sociological analysis of specific losses in families with cancer children during a special treatment.

Methods: The retrospective analysis of the data obtained through questionnaire survey during a sociological cohort study of parents (N=1298; 1131 mothers, 167 fathers, from 78 regions of Russian Federation), whose children have completed a special treatment. The data from the Russian statistics agency's study (N=1118) were used as control. Statistical analysis: SPSS statistics 17.0, one-sample student's t-test.

Results: The family members in addition to the possible death of a child experience a number of psychotraumatic events, which are perceived as losses and lead to a serious deterioration of physical, social, material, psychological status: loss of life plans and prospects – 98%; general health – 12,9%; reproductive health – 15,2%; deterioration of housing conditions due to moving to a place of treatment – 22,7%; relations with surroundings – 22,1%; family relations – 18,4%, divorce - 8,1%, death of a spouse – 8,9%; dismissal from work – 18,3%; demotion – 21%; falling incomes to the lowest – 41,8%. Unemployed women in the studied cohort were 34,6 vs 16,8% in population, p005 low–income families – 41,8% and 31,4%, correspondingly (p0.01). Family members experienced prolonged separations during the treatment.3% of families had at least two disabled children, 4,3% had already experienced the death of a child.

Conclusions: The study made it possible to qualify the problems in these families from the point of view of multiple losses and proved the need to substantiate the strategy and methods of grief therapy as a subject of intervention by clinical psychologists in the treatment of cancer.

Adolescents and Young Adults

0047: Assessment of transition readiness among adolescent patients and their caregivers at a tertiary referral center for pediatric cancer and blood diseases

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Keywords: adolescents, cancer, health care

Objective: Transitioning from pediatric to adult care has become vital in health care as more children and adolescents with special health care needs survive into adulthood. Adolescents, their families, and health care providers must prepare to ensure a smooth transition. The readiness of adolescents and their caregivers must be evaluated to tailor transition programs to their needs. The objective of the study was to evaluate the readiness for the transition of adolescent patients with the following conditions: a) thalassemia, b) hemophilia, c) those who have completed antineoplastic therapy and those who are childhood cancer survivors, and that of their caregivers. The study also aimed to describe the clinical and demographic profile of the respondents.

Methods: This was a cross-sectional study in the Philippine Children's Medical Center - Cancer and Hematology Division, wherein 77 adolescent-caregiver dyads answered a self-administered questionnaire on transition readiness. The questionnaire was adapted from the transition readiness assessment tools of the American Society of Hematology and Got Transition™ and was translated into Filipino.

Results: Most of the respondents were in middle adolescence (40.3%), and those who completed antineoplastic therapy and childhood cancer survivors (66.2%). Respondents with thalassemia and

those who completed antineoplastic therapy gave a lower average rating on the importance of being able to manage their health care compared to their hemophilia counterparts. Both groups of adolescents gave a low average rating on the importance of transitioning to adult health care, their confidence in managing their health care, and their confidence in preparing for the transition. The caregivers also gave a low average rating in the importance of and their confidence in their child being able to manage his/her health care and in preparing for the transition. Across the domains of health management skills, most adolescents were still beginning their involvement in their care.

Conclusions: The Cancer and Hematology Division transition program should emphasize helping adolescent patients develop their skills in managing their health. Transition readiness assessment should be done periodically within each stage of adolescence to obtain a clearer picture of how ready an adolescent patient with special health care needs is for transition to adult care.

Adolescents and Young Adults

0070: Attitudes and practices towards fertility preservation among oncologists in Saudi Arabia: a call for establishing national fertility preservation units

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Keywords: fertility preservation, adolescents, cancer

Background: Fertility Preservation practices have evolved dramatically over the last decade. Incorporating fertility preservation practices are recommended by national and international

oncology guidelines. Despite these guidelines, Fertility counseling is either not offered or preservation services and resources are not available. Aim: To Evaluate the Availability of fertility preservation services along with awareness and practices among oncologists regarding fertility preservation.

Methods: Methodology:89 Oncology physicians participated in completing a questionnaire-based survey about managing cancer patients at risk of infertility. The survey had closed-ended multiple-choice questions addressing the magnitude of the issue, the number of patients at risk, accessibility to fertility preservation clinics, and Opinions on best practices.

Results: There were a total of 89 Participants with the Majority being Pediatric Hematology/ Oncology physicians (68) in comparison to (21) Adult oncologists and Hematologists.96% of oncologists worry about Infertility as a side effect in their patient population. only 70 % of Participants had access to local fertility experts in comparison to 30 % who did not have access. The majority of referral patterns happen post-therapy (88%) and only (12%) refer prior to therapy. There was a consensus agreement of all of the participants that establishing an Onco-fertility unit is essential for patients with Cancer.

Conclusions: Conclusion: Establishing a new service such as a fertility preservation unit within the Oncology center is essential. Identifying barriers to opening such units is crucial. Identifying resources in each center and designing initiatives that help patients get appropriate counseling are needed.

Adolescents and Young Adults

0142: Enhancing aya health in low-resource settings: an urgent call to action

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Keywords: AYA cancer, LMIC, fertility, cancer genetics

Objective: Adolescents and young adults (AYA) diagnosed with cancer constitute a distinct patient cohort with specific characteristics. Globally, an estimated 1,253,412 new cases of cancer in 15-39-year-olds were reported in 2020, comprising around 6.5% of all cases. In Armenia, a dedicated AYA program for cancer patients is currently lacking. Consequently, all individuals above the age of 18 receive care across a range of hospitals, resulting in considerable differences in clinical management and access to optimal treatment.

Methods: A retrospective analysis was carried out on the medical records of cancer patients between the ages of 15 and 25 who received treatment at the Hematology Center after Prof. R. H. Yeolyan following the national protocols (including the adult and pediatric departments) from 2019 to 2021.

Results: Among the cohort of 110 patients, 65 were male, with a mean admission age of 18 years. Prior to treatment, only 5 patients (4.5%) received genetic counseling, while sperm banking was performed for 30 patients (46%). In total, 11 patients (10%) sought diagnosis or treatment abroad

due to unavailability within Armenia. Forty-one patients had lymphomas, 25 leukemias, 18 sarcomas, 18 carcinomas, and 4 CNS tumors. The median diagnostic delay for solid tumors was 90 days, while that for hematological malignancies was 9 days. During treatment, 19 patients required admission to the ICU department, and the protocol had to be altered for 10 of these cases. Virtual tumor boards featuring international experts were convened for 53 cases, with 34 paraffin blocks being sent overseas, resulting in 13 final diagnoses being amended. Treatment discontinuation was reported in 10 cases, with disbelief in the efficacy of the treatment being the primary factor. This rate is commensurate with findings from other developing nations. Currently, 92 patients are alive as of the publication of this report.

Conclusions: Implementing a dedicated AYA program in Armenia will serve as a critical component in providing patient-centered care, bolstered by age-appropriate infrastructure, and comprehensive clinical, psycho-social, and allied health support. This program will significantly reduce the rate of treatment abandonment, diminish the duration of diagnosis delay, and alleviate emotional detachment and disarray.

Nursing

0043: Effectiveness of preventive measures program on patients knowledge with ulcerative colitis about colorectal cancer at gastroenterology and hepatology teaching hospital in medical city directorate

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Keywords: colorectal cancer, colitis, cancer

Objective: Colorectal cancer is the third most common cancer which leads to death among men and women worldwide. Diet has a big role to decrease risk of CRC. In addition, adherence patients for medication can decrease developing of ulcerative colitis to colorectal cancer. The effects of non-adherence patients to medication increased the morbidity and increased risk of accidental relapse, decreased quality of life and possibly increased risk of colorectal cancer. (Brett, et al., 2018)

Methods: A quasi -experimental design study was performed on patients who attended Gastroenterology and Hepatology Teaching Hospital, from March 2021 to March 2022. The non-probability sampling including 50 patients for study group and 30 patients for control group patient was selected purposely based on the study criteria and after obtaining consent permission from them. The study instrument consists of 6 parts, the first part the Socio-demographic, the unhealthy behaviors, and the medical history. Part two inflammatory bowel disease knowledge self-report questionnaire. Part three the patient adherence for diet questionnaire. Part four the

patient adherence for medication questionnaire. Part five assessment of Patients' stress and fatigue, part six the Stress reduction methods and the patient uses of stress management. The data was analyzed by using the program of statistical package of social sciences Version 26. Both descriptive and inferential statistical analysis approaches were used in order to analyze the results of the study.

Results: The results of the present study shows that there were highly significant differences between pre and post implementation of preventive program at p-value= 0.05. There were significant differences between the effectiveness of instruction program regarding adherence of patients for diet and medication, significant for methods of stress reduction, and significant regarding adherence of patients for stress management with patient age. In addition, there was a highly significant relationship between the effectiveness of the program and patient age, social status, level of education, and significant relationship between the effectiveness of the program and monthly income, and residency.

Conclusions: The preventive program has a positive effect on case group study to improve patient's knowledge, adherence to a balanced diet and medication to avoid deterioration of patient's health status, and then to reduce the incidence of colorectal cancer.

Nursing

0044: The role of a nurse in pain control service in pediatric hematological oncology

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Keywords: nursing, children, hematology

Objective: Pain is not only a symptom of most diseases, but also a complex psychophysiological phenomenon with a negative influence on quality of life. As defined by the International Association for the Study of Pain (IASP), pain is an emotional experience associated with existing or potential tissue damage in the body.

Methods: As part of a multidisciplinary team, the haematology oncology nurse plays an important role in ensuring a detailed and individualised approach to patients of different age groups treated in the wards of the clinic. The nurse is responsible for the objective assessment of pain, which may be physical (increased physical exertion, uncomfortable posture, sleep disturbance, digestive dysfunction, dizziness) or psychogenic (depression associated with fears, anxiety, feelings of helplessness and loneliness). The department uses several pain assessment scales: Visual analogue scale. Numeric scale. Verbal scale, Wong-Baker Faces Pain Rating Scale. Pain tolerance scale.

Results: Nociceptive pain syndrome due to mucositis was the main reason for treatment. The average age of patients in the pediatric hematological oncology unit was 6 years (0.2-18 years). Reasons for contacting pain service in pediatric departments in 2022 (n=220) mucositis 56%, paraproctitis 1%, acute cystitis 2%, bone pain 25%, progression of the underlying disease 15%, neuropathic pain 1%. The introduction of a pain management service in the clinic would improve

the quality of life of patients with pain syndromes of various etiologies. An anesthesia nurse would help to improve the quality of patient monitoring both at the stage of analgesic therapy and at the stage of withdrawal of analgesics administration. It is important to note that, as part of a multidisciplinary team, the anaesthesia nurse takes an active role in discussing the patient's treatment tactics, as in some cases she has more detailed and relevant information as a result of long and ongoing interaction with the patient and their relatives, which allows a holistic understanding of pain management strategies to be formed.

Conclusions: The pain management service is a sought-after structure in the treatment of patients with oncohematological diseases of different age groups in different countries. The anaesthesia nurse is a highly trained professional and a key member of the multidisciplinary pain management team.

Nursing

0045: Building capacity for infection prevention and control in Pakistan's pediatric oncology units

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Keywords: infection control, cancer, children

Objective: Pediatric cancer is a significant public health challenge in Pakistan, and access to quality care is limited, particularly in the public sector. The Indus Hospital and Health Network (IHHN) partnered with nine public-sector hospitals across the country to strengthen pediatric oncology practices through the My Child Matters (MCM) grant awarded by the Sanofi Espoir Foundation. Infection prevention and control (IPC) is a critical component of cancer care, particularly for

immunocompromised patients. The objective of this initiative was to improve the quality of care provided to pediatric cancer patients in Pakistan and to strengthen the IPC capacity of public-sector hospitals treating children with cancer in the country.

Methods: The Department of Pediatric Oncology at IHHN offered a scholarship to one participant from each of the nine partnered centers to attend a one-year online diploma course offered by the Department of Infection Prevention and Control at IHHN. The scholarship covered the cost of the course, and participants agreed to work for their current institute for one year following completion of the course to receive their diploma certificate.

Results: After completing the diploma course in September 2022, the participants playing an active role as IPC nurses in their respective units, including teaching healthcare workers about hand hygiene, environmental cleaning, and auditing hand hygiene and environmental hygiene practices. The participants also met monthly on Zoom with the hub center to present monthly activity reports. This initiative is expected to improve IPC practices in partnered pediatric oncology units across Pakistan, ultimately leading to better outcomes for pediatric cancer patients.

Conclusions: This initiative aims to enhance the skills and knowledge of healthcare providers in infection prevention and control, particularly in the care of pediatric cancer patients and is an important step towards addressing the disparities in access to quality cancer care in the country.

Nursing

0046: Metabolic changes following chemotherapy among children, systematic review

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Keywords: metabolic changes, chemotherapy

Objective: Childhood cancer following treatment may develop a metabolic syndrome. Distinguishing metabolic pathways leading to metabolic complications. Major metabolic changes could be triggered by chemotherapy. These difficulties might disrupt the body's energy flow, which can worsen prognosis. As an additional note, the link between Metabolic syndrome and cancer is not fully known, however there are some hypotheses. Objectives To Identify metabolic changes in children with cancer before and after chemotherapy.

Methods: Using PubMed/MEDLINE according to PRISMA guideline, relevant studies located through November 2nd, 2022. studies sought out that covered a wide range of cancer categories and treatment phases. Patients were chosen only if they had had chemotherapy prior to surgery or radiation. Six months was decided as the longest possible period of observation. The primary result was a decline in cardiovascular disease, growth, obesity, glucose impairment, hypertension, and the emergence of new cancers, among other organ dysfunctions. The body composition test results were only taken into consideration as a supplementary outcome measure.

Results: A total of 288 patients from 12 trials were chosen. Insulin sensitivity, Vascular disorders, hormone deficits, inflammatory mediators, and lipid metabolism are all linked to cancer therapy. Cranial radiation, being female, and exposure to glucocorticoids like dexamethasone all increase

the likelihood that a child with cancer may become obese. During and after chemotherapy and radiation therapy, the incidence of metabolic syndrome increases in children with leukaemia and lymphoma. These children need lifelong monitoring for metabolic syndrome and other potential long-term complications. Children undergoing chemotherapy had an increased risk of psychoneurological symptoms, and this risk was linked to the fatty acid and amino acid pathways. There has to be more research done on a larger number of participants to confirm these results. **Conclusions:** The data show an important modification in weight, body mass index, and waist circumference as in triglycerides, and cholesterol that could be associated with the development of metabolic syndrome. More randomized control trial needed among larger population of children affected with cancer with control and fixed variables to detect associations.

Nursing

0109: Pediatric oncology & communication problems: what do patients' parents not ask us?

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Keywords: pediatric oncology, communication barriers, doctor-parent communication, medical staff-parent communication, information platform

Objective: Communication during treatment is vital as it is directly related to treatment outcomes. Obtaining and possessing reliable information for patients and family members is a crucial component of building successful and strong communication links between the doctor, patient,

and, in the case of pediatric cancer, the child's legal guardians and family members. Our aim is to identify and analyze communication barriers in the following areas: doctor-parents (guardians) and medical staff-parents (guardians) of a pediatric cancer patient.

Methods: A retrospective cohort study was conducted among parents of pediatric oncology patients who cared for their child during the course of programmatic chemotherapy. The information was collected indirectly, the respondents provided information remotely and anonymously, using Google Forms.

Results: The survey involved 106 family members of pediatric cancer patients who received treatment in Ukrainian medical institutions specializing in the treatment of pediatric cancer. 34% of respondents reported that it was difficult to find contact with doctors, and 22.6% - with nurses and nursing staff. 56% reported a lack of time to communicate with their doctor. Given that the vast majority of respondents (81.2%) mentioned doctors and medical staff as the most convenient source of reliable information on pediatric cancer, the researchers proposed to create an information platform for parents of pediatric cancer patients to provide access to information on the main points of pediatric cancer. Within a 5-month period, a YouTube channel was created that contained basic information for parents of pediatric cancer patients who first learned about the diagnosis and had many questions. Thirty videos were created with answers to basic questions about diagnostic protocols, key diagnostic and treatment stages, the legal framework for protecting the rights of patients with pediatric cancer, and the importance and need for psychological support for patients and their families during cancer therapy.

Conclusions: The study revealed the following problems: lack of adequate communication between parents of patients and doctors and medical staff; insufficient preparation of parents for the situation and emotional trauma; lack of time for doctors and medical staff to establish communication. The study found a tool to eliminate these communication errors - the creation of a video channel with visual thematic and clearly structured content for parents of pediatric cancer patients.

Nursing

0110: Patient and family education in pediatric oncology: insight from nurses, patients and families across POGO tertiary and satellite centers

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Keywords: patient and family education, pediatric oncology, health communication, nurses, family-centered care, quality improvement

Objective: Patient and family education is a necessary, yet sometimes overwhelming component of care following a diagnosis of cancer in childhood. The Paediatric Oncology Group of Ontario (POGO) has identified through a formal needs assessment in the Childhood Cancer Care Plan: A Road Map for Ontario 2018-2023, that there is emerging evidence to support the development of best practice for the delivery of patient and family education in paediatric oncology. The aim of this project is to improve the quality of patient and family education and health communication in paediatric oncology within Ontario, through survey insight from patients, families, and nurses regarding current educational practices specific to paediatric oncology.

Methods: This quality improvement (QI) project follows a mixed-methods approach of in-person interviews and internet-based surveys to assess current educational practices and resources across paediatric oncology healthcare centers in Ontario.

Results: The results of this project provide valuable insight into how nurses communicate and perceive health literacy; and in determining how patients, families, and nurses in the field of paediatric oncology may benefit from an adaptable education roadmap. The majority of families

surveyed ranked verbal discussion as their most preferred learning style, and expressed a positive outlook on the helpfulness that a roadmap could potentially provide. Nurses, as well, expressed that there are a multitude of educational resources available to assist in patient and family education.

Conclusions: This project ultimately brings together current and relevant recommendations within the paediatric oncology health care system to gain insight on patient, family, and nurse perspectives on family centered health education and communication. Province-wide implementation of a standardized education roadmap may provide for a supportive learning environment for families with a child diagnosed with cancer, while enhancing collaboration between the individual, family, and interdisciplinary health care team.

Nursing

0112: The effect of simulation-based blended educational program on knowledge, skill, and quality indicators (ADES)

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Keywords: simulation-based, blended educational program, knowledge, quality indicators, implantable venous access devices (IVAD), adult learning principles

Objective: To standardize the care and handling of Implantable venous Access Devices (IVAD) among oncology patients, it is essential to develop standards of care and practice and disseminate them to the front-line oncology registered nurses using suitable and appropriate adult teaching

strategies. Knowing adult learning principles, it is crucial to come up with educational teaching strategies that will help in delivering the material and critical information to the target audience effectively.

Methods: The Implantable Venous Access Device Blended Course is designed to provide selected registered nurses at the American University of Beirut Medical Center with the needed resources to increase their knowledge, and skills and improve their practice when caring for patients with IVAD. The course was divided into an online section that is paced by the learner, followed by an exam to assess knowledge. After that, the participants were invited to skill-based testing sessions and participants' skills were assessed using case scenarios and a return demonstration of the assessed skill. As a final step and to verify the competence, participants were requested to observe one access/ de-access attempt of IVAD with a clinical educator or resource staff, followed by two successful attempts of access/ de-access of each participant.

Results: Two hundred forty-three registered nurses dealing with IVAD passed the qualifying exam with an average grade of 85%. Fifty- eight percent of the course participants were highly satisfied with the educational strategy used as evidenced by the program evaluation survey results. Zero ADEs related to IVAD were reported to the Quality and Risk Management Department in the period following the implementation of this educational project.

Conclusions: In conclusion, the implementation of skill-based blended educational programs has a direct effect on the improvement of knowledge, skills, and quality indicators related to patient care. Future recommendations include implementing such a course at a larger scale to include national and international participants followed by data collection to assess the effectiveness of such an educational program at a larger scale.

Nursing

0113: Application of tepid water sponge to reduce body temperature in pediatric patients' febrile neutropenia with acute lymphoblastic leukemia

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Keywords: febrile neutropenia, pediatric patients, acute lymphoblastic leukemia, tepid water sponge, body temperature, nursing intervention

Objective: Febrile neutropenia in children with Acute Lymphoblastic Leukemia (ALL) is a state of increased body temperature (> 38°C) caused by a decrease in absolute neutrophil count (ANC). Febrile neutropenia is a cause of mortality and morbidity in children with malignancy. The mortality rate is estimated to be up to 11% in pediatric patients with hematologic malignancies. Fever in children requires special treatment, namely by keeping the fever that occurs does not increase, so that the possibility of children experiencing febrile seizures and dehydration can be avoided. Nurses can perform independent nursing interventions to treat febrile neutropenia, such as using a water sponge to reduce the child's body temperature.

Methods: This scientific paper was based on the results of a six-day patient performance management at a national referral hospital in Jakarta. The goal of this scientific paper is to see how the tepid water sponge affects febrile neutropenia in children with Acute Lymphoblastic Leukemia (ALL).

Results: The results showed that tepid water sponge nursing interventions were efficient in reducing febrile neutropenia by 1°C to 1.6°C. Tepid water sponges are also more effective at reducing fever than conventional warm compresses. These results are intended to be implemented as a recommendation study for one of the nursing interventions used to reduce body temperature in children with febrile neutropenia.

Conclusions: Tepid water sponge nursing intervention proved effective in reducing febrile neutropenia from 1℃ to 1.6℃. This is because the tepid water sponge will accelerate the vasodilation of peripheral blood vessels throughout the body so that the evaporation of heat from the skin to the surrounding environment will be faster, thereby effectively reducing febrile neutropenia in children. Application of tepid water sponge can also be useful in patients with febrile neutropenia who experience increased liver function thereby reducing the use of antipyretic drugs such as paracetamol. Tepid water sponges are recommended for nurses to reduce febrile neutropenia in addition to administering antibiotics, examining blood cultures, and other treatments to reduce infections that cause recurrent fever in patients.

Nursing

0114: Complications of central venous catheters in patients undergoing hematopoietic Stem Cell Transplantation in Armenia

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Keywords: central venous catheters, hematopoietic Stem Cell Transplantation, complications, infection, nursing care, Armenia

Objective: Central venous catheters (CVCs) are an important component of bone marrow transplantation (BMT) for chemotherapy, parenteral nutrition (PN), and blood infusion. Long-term CVC access is associated with an increased risk of infection and device dysfunction.

Methods: Medical records of thirty-nine patients are reviewed and analyzed to track catheter-related complications in the Bone Marrow Transplantation Department of Hematology Center after prof. R. H. Yeolyan, Yerevan, Armenia. Examination of the central line was done daily. CVL dressing was replaced every day for non-tunneled catheters, and every third day for tunneled catheters. Transparent dressing (Tegaderm) was used to dress central lines. A 2% chlorhexidine-soaked cotton swab and 70% alcohol were used for at least 30 seconds to disinfect and around the catheter. Both types of CVLs were flushed with 2.5 ml of heparinized saline (10u/ml) twice a day.

Results: 12 children (median age 6 years, age range [2 – 16] years) and 27 adults (median age -41 years, range [19 – 60] years), underwent HSCT. 2 (5.1%) pediatric patients with sickle cell anemia underwent allogeneic hematopoietic Stem Cell Transplantation. A single-lumen Hickman tunneled catheter was placed in 2 (5.1%) patients. A double-lumen non-tunneled catheter was placed in the rest of the patients 37 (94.9%). 4(10%) children developed complications; 2 central line-associated bloodstream infections, 1 pneumothorax, and 1 local hematoma. 5 (12%) adult patients developed a catheter-associated infection. In 37 patients, CVL was removed with a platelet count > 50000/mcL, and in 2 patients a platelet counts 20000/mcL. No episodes of bleeding were reported. 7 patients were febrile at the time of CVL removal, of whom 5 became afebrile within and 2 patients needed a change of antibiotics. Positive blood cultures were found in the CVLs of 7 patients, 5 of whom became afebrile within 2 days of line removal.

Conclusions: The first transplant was conducted in 2018 and here we reported CVL-associated complications of our first 39 patients. CVC-associated complications are frequent during HSCT and nursing care is an ascension component of HSCT.

Nursing

0149: The role of the nurse in prevention and management of extravasations among pediatric cancer patients in Armenia

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Keywords: childhood cancer, extravasation, nurse, chemotherapy

Objective: Extravasation is an accidental leakage of medications from the venipuncture site to the surrounding tissues. Various chemotherapy agents, including vesicants, can cause severe injuries and even lead to tissue necrosis. The role of the pediatric oncology nurse in preventing and managing extravasation is crucial. Hence continuous training and practice according to the guidelines decrease the risks of extravasations.

Methods: Since 2019 Pediatric Cancer and Blood Disorders Center of Armenia have highlighted the importance of nursing education in the pediatric oncology field and, through international collaborations, initiated continuous educational nursing programs in Armenia. Various guidelines, including extravasation prevention and management guidelines, were adapted and applied in the center, which led to better practice in terms of prevention and management of extravasations.

Results: Annually, 80-100 pediatric cancer cases are diagnosed in Armenia, and 60% contribute to solid and brain tumors. Out of 60% of primary cases, 40% receive chemotherapy treatment. From 2019-2022 in the pediatric oncology department, almost 200 children received chemotherapy treatment with a diagnosis of solid tumors and lymphomas. In treating solid tumors and

lymphomas through various treatment schemes, patients received vesicant chemotherapy agents. Retrospective descriptive data analysis indicated that within four years, two patients had grade 3 extravasation. Both patients were diagnosed with neuroblastoma and received doxorubicin through a peripheral catheter in the upper extremities. According to the analyzed data, only 1% of patients had extravasation injuries in four years.

Conclusions: According to the available literature, the incidence of extravasation is estimated to be 1-6% per year. According to our data, in 4 years, 1% of severe extravasation cases were described. Proper prevention and education on the management of extravasations through educational programs and implementation of guidelines in nursing practice lead to better training in the field.

Nursing

0151: Case report of etoposide reaction in a patient with Hodgkin's lymphoma

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Keywords: chemotherapy, etoposide, infusion-related allergic reactions, hypersensitivity, childhood cancer

Objective: Chemotherapy infusion-related allergic reactions rarely occur but can be life-threatening and lead to the lethal exit of the patient. Etoposide is a commonly used chemotherapeutic agent in treating various childhood cancers. Acting as an irritant and vesicant can cause mild allergic reactions, including urticaria, to severe hypersensitivity reactions such as hypotension, bronchospasm, and respiratory distress, leading to death. According to the available evidence, hypersensitivity reactions of Etoposide accounted for only 1-3%. The pediatric oncology nurse's role is crucial in identifying and managing allergic reactions.

Methods: We describe a case with Hodgkin's Lymphoma and hypersensitivity reaction from Etoposide infusion during the first injection.

Results: The case is about a 14 years old female diagnosed with Hodgkin's Lymphoma IIB stage disease who was admitted to the clinic with complaints of fever and cervical lymphadenopathy. The treatment was started according to the Euronet PHL protocol and OEPA scheme (Prednisolone, Doxorubicin, Vincristine, and Etoposide). During the first day of the treatment, the patient received premedication with dexamethasone and diphenhydramine before the injection of Etoposide. A hypersensitivity reaction occurred in the first minutes of injection, expressed by bronchospasm and hyperemia. The injection was stopped immediately, hemodynamic parameters were checked, and dexamethasone with diphenhydramine was injected, and within several minutes the patient started to breathe without difficulty.

Conclusions: Identification of signs of hypersensitivity reactions and proper management is essential and plays a huge role and can save patients' lives. The role of the nurse is vital, and nursing education in the identification and management of allergic reactions is essential.

Nursing

0118: Effectiveness of prophylactic antibiotics and filgrastim in reducing infections among pediatric patients with acute myeloid leukemia

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Keywords: pediatric acute myeloid leukemia, antibacterial prophylaxis, filgrastim, bloodstream infections, treatment-related mortality, neutropenic fever

Objective: Currently, many different intensive chemotherapy protocols were used to treat pediatrics with Acute Myeloid Leukemia (AML) which improve patient survival rate (Reedijk et al., 2019). These types of treatment can lead to several types of complications and toxicities like neutropenic fever, bacterial, fungal and viral infections, and can be life threatening if the management is delayed (Reinhardt et al., 2022). Sepsis is the common treatment related to death of children with AML, this complication has decreased the last years due to use of prophylaxis antimicrobials, in addition to different supportive care (Sung et al., 2009). However, there are still a lack of studies carried out among the using of prophylaxis antibacterial and the use of filgrastim to reduce infections among pediatrics with AML (Felsenstein et al., 2015).

Methods: Comprehensive data search using studies published in PubMed, google scholar, Cochrane library between 2010 -2023 in English, and assessed the effectiveness of using prophylactic antibiotics and filgrastim in reducing infections among pediatric patients with acute myeloid leukemia.

Results: High percentage of patient receiving prophylactic antibiotics and filgrastim In patient with

AML, showed their effectiveness in reducing treatment related mortality, and reducing the hospitalizations period, in addition to improve patient survival, in addition to reducing the episodes of neutropenic fever, reducing the cost I addition to reducing the cost.

Conclusions: The rate of infection is high among Patients with AML receiving chemotherapy treatment, prophylactic antibiotics, filgrastim are essential to use during the treatment to reduce the infection rate. key words: pediatric acute myeloid leukemia; antibacterial prophylaxis; filgrastim; bloodstream infections.

Neuroblastoma

0041: Dinutuximab for the treatment of pediatric patients with high-risk neuroblastoma

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Keywords: neuroblastoma, dinutuxumab, children

Objective: Neuroblastoma is the most common extracranial solid tumour in children, accounting for 15% of all paediatric cancer deaths. Neuroblastoma has a number of unique characteristics: a capacity for spontaneous regression in babies younger than 12 months even in the presence of distant metastases, for differentiation (maturation into ganglioneuroma) in infants after the first year of life, and for swift aggressive development and rapid metastasis. High-risk neuroblastoma is a particularly challenging-to-treat form of disease that requires multimodality treatment, consisting of chemotherapy, surgery, high-dose chemotherapy with autologous haematopoietic

stem cell rescue, radiotherapy and differentiation therapy. However, despite intense multimodal treatment regimens, the prognosis for this patient population remains poor. In recent years, immunotherapy with anti-disialoganglioside 2 (anti-GD2) antibodies was found to improve survival rates for patients with high-risk neuroblastoma. Immunotherapy, including dinutuximab, improved survival in children with high-risk neuroblastoma who responded to induction and consolidation therapy. In this connection, the drug was registered on the territory of the Russian Federation. We present our own experience with dinutuximab.

Methods: The study included 39 patients with high-risk neuroblastoma treated with dinutuximab-beta immunotherapy.

Results: Most of the patients were aged 1-5 years (74.5%). Localization: adrenal in 20 patients (51.3%), retroperitoneally in 11 patients (28.2%), mediastinum in 5 patients (12.8%), pelvis in 3 patients (7.7%). All 39 patients received dinutuximab beta immunotherapy after high-dose chemotherapy. Patients received a total of 5 courses of immunotherapy. Based on the results of treatment, overall and event-free survival rates increased by more than 15%.

Conclusions: GD2-targeted immunotherapy with dinutuximab beta, used as a post-consolidation therapy, currently significantly improves the prognosis in patients with high-risk neuroblastoma.

Neuroblastoma

0042: Naxitamab in patients with high-risk refractory/relapsed neuroblastoma

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Keywords: Naxitamab, relapse neuroblastoma, children

Objective: Patients with relapsed and primary refractory neuroblastoma (NB) high-risk have an extremely unfavorable prognosis of the disease. The 5-year overall survival (OS) of this group of patients is less than 20%. The use of immunotherapy with anti-GD2 antibodies as post-consolidation for the first time in a long time allowed us to achieve positive results of OS in the group of patients with relapsed/primary refractory NB-HR. To present the first experience of using anti-GD2 antibody therapy (Naxitamab) in combination with chemotherapy (HITS regimen) with the assessment of the toxicity profile in patients with primary refractory/relapsed NB.

Methods: 7 patients with NB received Naxitamab treatment under Expanded access at the Research Institute of Pediatric Oncology and Hematology from February 2022 to October 2022. Median age at diagnosis was 71 months. (range 52–152 months). Sex: 4 (57.2%) patients are girls, 3 (42.8%) are boys. 4 (57.1%) patients had primary localization of the tumor in the adrenal glands, 2 (28.5%) - in the posterior mediastinum and 1 (14.3%) - in the retroperitoneal space. Stage 4 of the disease was established in 6 (85.7%) cases, 3 - in 1 (14.3%). MYCN gene amplification was found in 1 (14.3%) case, MYCN gain in 2 (28.6%) cases, 1p deletion in 3 (42.8%) cases. All patients

received HITS therapy in cycles of 3 weeks: temozolomide 150 or 100 mg/m2 orally (days 1-5), irinotecan 50 mg/m2 intravenously (days 1-5), naxitamab 2.25 mg/kg intravenously (days 2,4,8 and 10) and GM-CSF 250 μg/m2 subcutaneously (days 6-10). 3/7 patients received HITS therapy in the first line of therapy, 4/7 in relapse/progression of the disease. The main criteria for Naxitamab therapy was an unsatisfactory response to induction therapy. Toxicity assessment was carried out according to the International Toxicity Criteria (Common Terminology Criteria for Adverse Events) version 5.0.

Results: At the time of data cutoff, patients underwent from 2 to 7 HITS cycles (122 naxitamab infusions). According to the results of interim examinations, all patients, with the exception of 2, one of whom had MYCN gene amplification, showed no signs of disease progression. In 3 patients a partial response was achieved, in 2 patients stabilization of disease was achieved. Adverse events (AE) of varying severity were recorded in 100% of cases. The most common AE was pain from 8 to 12 points according to the pain rating scale, which was registered in 100% of cases at the first infusion in each cycle. It is important to note that with each subsequent cycle of therapy, the intensity of the pain syndrome decreased to 4-6 points according to the pain rating scale. Other AEs included: skin toxicity 2-3 grade (erythema) in 5 (71.4%) patients, disorders of the cardiovascular system 2-3 grade were registered in 5 (71.4%) patients (hypotension 2-3 grade in 4/5, hypertension 2 grade in 1/5), diarrhea 2-3 grade 4/7 (57.1%), eosinophilia 1/7 (14.3%), broncho-obstructive syndrome in 1/7 (14.3%). AE 4 and 5 grades during naxitamab therapy were not registered.

Conclusions: The use of HITS regimen can be implemented in a specialized center with appropriate training of personnel. In some cases, therapy is associated with the development of serious but controlled adverse events.

Neuroblastoma

0115: Arterial celiacomesenteric and renal anomalies: the opportunity of incorporation into the image defined risk factors system

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Keywords: arterial anomalies, celiacomesenteric arteries, renal arteries, image defined risk factors (IDRF), perioperative adverse events

Objective: Background Imaging system with risk factors assessment for Perioperative adverse events in planning of the operation Image Defined Risk Factors (IDRF) has been actively used since 2009.However it does not take into account variants of anatomy of the celiacomesenteric and renal arterial vessels. To study the opportunity to determine vascular anatomy of the celiacomesenteric and renal arterial vessels using CT and definition of additional imaging risk factors for vascular involvement in the tumor.

Methods: The study included data of 50 children aged from 0 to 18 years with morphological verified thoracoabdominal neuroblastoma. The data of their primary CT were analyzed

retrospectively. IDRF was used to assess possible tumor invasion into vessels. Surgical risk factors include the following types of vessel involvement: "encasement" and "invasion".

Results: Classical anatomy of arterial vessels was found in 25 (50%) patients. Accessory renal arteries were determined in 18 (72%) cases. Tumor "invasion" of accessory renal arteries was detected in 11 (61,1%) patients. Variations in hepatic artery anatomy were seen in 11 (44%) patients. In 3 patients (21,4 %) with anatomical variations, abnormally outgoing vessels were "encased" by the neoplasm. Atypical variants of celiac trunk were diagnosed in 3 (12%) cases, while in 1 (33,3%) case it was diagnosed vascular involvement in the tumor. 3 (12%) patients had a mixed type of arterial anomalies. The involvement of abnormal vessels in the tumor was important for the surgical planning.

Conclusions: One third of our patients had classical anatomy of arterial vessels which is approximately 40% lower than published Cases et al (2017). Variations of celiacomesenteric arteries not included in the types of classification by N. Michels (1955) were also revealed. These data should be considered for the surgical planning. An "encasement" and "invasion" of aberrant vessels should also be assessed as a surgical risk factor for perioperative complications.

Neuroblastoma

0116: Descriptive analysis of pediatric neuroblastoma cases in a single setting from 2019-2022 in Armenia

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Keywords: neuroblastoma, pediatric cancer, descriptive analysis, Armenia, disease recurrence, Myc-N, amplification

Objective: The group of neuroblastic malignancies is considered to be the most commonly occurring extracranial solid tumor among children and accounts for around 15 percent of all pediatric cancer fatalities. The research aims to evaluate descriptive data on age, gender, risk group, regional distribution, disease recurrence and progression of neuroblastoma cases in Armenia from 2019 to 2022.

Methods: Pediatric Cancer and Blood Disorders Center of Armenia was founded in 2019 which provides centralized cancer care for the pediatric population. Through retrospective descriptive data analysis neuroblastoma cases from 2019 to 2022 were analyzed in a single center.

Results: From 2019 to 2022 overall 45 patients were diagnosed with neuroblastoma, including one case of ganglioneuroma, four cases of ganglioneuroblastoma and forty cases of neuroblastoma. Gender distribution was almost the same counting 49% male and 51% female patients. Among 45 patients, 18 patients were diagnosed before 18 months and 27 patients were older than 18

months. Regional distribution of the disease in Armenia indicated that out 46% of neuroblastoma cases were from Yerevan and 54% from different regions of Armenia. For instance, in Kotayk and Armavir regions 11% of cases were reported separately. In Gegharkunik, Aragatsotn and Syunik regions disease burden was the same, accounting 12% of all cases, the number of cases were equally distributed in Artsakh, Vayots Dzor, Tavush, Lori and Shirak regions together accounting for 22% of all neuroblastoma cases and in Ararat region disease burden was 6%. According to the data 60% of patients were in an advanced stage of the disease and were classified as high-risk patients with Myc-N amplification of 15 patients out of 45. For 36% of patients Myc-N was not amplified and for 30% of patients Myc-N was status remained unknown. Low risk neuroblastoma cases accounted for almost 29%, intermediate risk group was evaluated as 11% and 60% of patients were within the high-risk group. Out of 45 cases 6 cases of reoccurrence of the disease, 14 cases progression of the disease were detected from 2019-2022.

Conclusions: Neuroblastoma is the third most common childhood cancer. Available evidence suggests that the majority of cases of neuroblastoma are observed at an advanced stage of the disease, which brings to frequent progressions and recurrence of the disease. Research findings are consistent with the available literature.

Radiation Oncology

0065: Radioiodine therapy for differentiated thyroid cancer in children

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Keywords: children, radioiodine therapy, thyroid cancer

Objective: Children are not "miniature" adults! Most experts around the world recognize the differences between adult and pediatric thyroid cancer (TC) and emphasize the need for specific guidelines for the pediatric population. In comparing the two guidelines (ATA 2015 and ETA 2022) with each other and with Russian clinical guidelines for the treatment of childhood TC, we found significant differences in determining the tactics of treatment and examination during radioiodine therapy (RIT). The aim of the report is to analyze our experience with RIT in children with DTC and to identify the most unresolved issues in the context of current international and Russian recommendations.

Methods: From December 2021 to February 2023, 55 pediatric patients (median age 14 years (6-18), 41 girls and 14 boys) underwent 58 RIT courses at the N.N. Blokhin National Medical Research Center of Oncology (Russia).

Results: All patients underwent surgical treatment of a primary or recurrent tumor. According to postoperative histological examination, 40 (72,7%) patients were diagnosed with classic papillary cancer (PC), 8 (14,6%) patients had aggressive subtypes of PC and 7 (12,7%) patients had follicular variant of PC. The evaluation of the primary tumor process extent revealed: multifocality in 22 (40%) patients, involvement of neck lymph nodes in 47 (85.1%), lung metastases in 8 (14.5%).

Adjuvant RIT to ablate residual thyroid tissue and reduce the risk of recurrence were performed at an average 131I activity of 2 GBq (1,1-4 GBq), therapy of lung metastases with 131I 4 GBq (1,83-4GBq). Out of 8 patients with lung metastases, 3 patients had a radioiodine refractory process. Lung metastases were associated with an advanced primary process (T3-4, N1b) and high TTG-stimulated thyroglobulin levels (from 118 ng/ml to >5,000 ng/ml).

Conclusions: On the way to a personalized treatment strategy for children with DTC prospective multicenter studies and the creation of international registries are needed.

Radiation Oncology

0068: Peer review of irradiation plans of clinics in the Russian Federation and neighboring countries

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Keywords: irradiation, children, treatment

Objective: The reliability of the results of research programs and success in the treatment of pediatric patients largely depends on the quality of the radiotherapy part of the treatment program. The incidence of childhood cancer in Russia is about 3,800-4,000 patients per year. In general, about 1,800 of them receive radiation therapy (RT). Approximately 600-700 patients per year receive RT in regional clinics with less than 50 patients per year experience. A group of leading experts in pediatric radiotherapy from 6 largest centers within the framework of the pediatric radiotherapy working group were involved in the process of reference assessment of radiation plans before the start of radiation. Aim The main purpose of preliminary assessment of plans from clinics that do not have extensive experience in irradiation of children is to prevent local relapses and excessive risks of developing complications of therapy.

Methods: In the period 2019-2022, 270 plans from 40 clinics in Russia and neighboring countries were evaluated. The contours of the target, critical structures, the prescription of doses and the acceptance of the plan as a whole were assessed. The assessment was carried out according to the following criteria: accepted, accepted with comments, not accepted - there is a high probability of relapse and / or the development of complications that can be avoided. Request statistics: 2019 - 3, 2020 - 42, 2021 - 86, 2022 - 139. Statistics of the involved clinics: 2019 - 3, 2020 - 17, 2021 - 35, 2022 - 40.

Results: The number of rejected contours was 39%, with plans 40% of all requests. In the first appeal, the target contours were not accepted – 56%, and plans – 59%.

Conclusions: Applying for an expert assessment of each radiotherapy plan is an important factor in ensuring high-quality RT.

Radiation Oncology

0069: Is re-irradiation therapy for brainstem tumors in children justified?

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Keywords: re-irradiation, brainstem tumors, children

Background: brain stem tumors are among the most severe oncological diseases in children. The only real method of help remains radiation therapy, which makes it possible to alleviate the severity of neurological disorders, but for most patients, the effect achieved, regardless of the type of ionizing radiation used, is temporary and after various periods (from 3 months to several years), the tumor resumes growth. Aim The main purpose of our work was to determine the possibilities and prospects of repeated radiation therapy in children with diffuse brain stem tumors.

Methods: In the period 1998 -2020, analysis of short and long-term results of 102 children and adolescents with brainstem tumor treated at the Russian Scientific Center of Roentgenoradiology were evaluated. Out of 102 patients treated at RNCRR, 50 children were selected whose remission lasted more than 9 months and the Lansky scale of more than 40 points for re-irradiation.

Results: As a result of re-irradiation, out of 35 children with the Lansky status 40-50 points, it improved in 30 (85%). An additional 10 children were included in the group with an initial the Lansky scale of 70-90 points, initially represented by one child, and only 5 patients' condition

worsened or did not change. The median life expectancy in the group of patients, after one course of radiation therapy was 14.7 months, in the group of those treated repeatedly - 23.8 months.

Conclusions: Re-irradiation using 30.0 to 45.0 Gy in standard fractionation in combination with adequate accompanying therapy in 90% of cases allows to increase the remission period in dense tumors and temporarily improve the quality of life in cystic solid tumors.