age at radiotherapy, as well as their interaction, could be risk factors for altered neurodevelopmental patterns of brain areas associated with visual memory.

QOL-09. SYMON-SAYS: A SYMPTOM MONITORING AND REPORTING PROGRAM FOR CHILDREN WITH CANCER

Jin-Shei Lai[1], Sally Jensen[1], Megan Urban[2], Stewart Goldman[3,4], Alicia Lenzen[2]; [1]Northwestern University, Chicago, IL, USA. [2]Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, IL, USA. [3]Phoenix Children's Hospital, Phoenix, AZ, USA. [4]University of Arizona College of Medicine – Phoenix, Phoenix, AZ, USA

Unrelieved symptom burden due to cancer treatments can lead to poor psychosocial functioning and decreased health-related quality of life (HRQOL) for patients and their families. Barriers at the patient, healthcare provider and system levels can contribute to poor symptom management. Funded by the US National Cancer Institute, we have developed the Symptom Monitoring & Systematic Assessment and Reporting System in Young Survivors (SyMon-SAYS) program. SyMon-SAYS is a technology-based program with the potential to minimize symptom management barriers by routinely collecting and interpreting patient-reported outcomes in pediatric oncology ambulatory settings in a manner that is efficient, actionable by clinicians, supports engagement of patients and families with their health and care, and improves clinical processes and outcomes. This is a single institution modified waitlist control 16-week randomized trial of 200 children (ages 8-17) with cancer and their parents/guardians. Participants in the intervention phase will complete a symptom checklist weekly via the electronic health record patient portal. Scores exceeding a pre-defined threshold will trigger an alert to the treatment team, which will review the report and take appropriate actions. Participants will complete a separate battery of questionnaires assessing HRQOL at baseline and weeks 8 and 16. The recruitment is in progress. As of today, we have recruited 57 patients/parents. 29 completed 16-week study (15 intervention & 14 wait-list). Preliminary results showed SyMon-SAYS system was easy (92%) and convenient (85%) to use. Parents were satisfied (74.1%) with the SyMon-SAYS program. Comparing to the waitlist control, intervention group parents reported significantly less concerns on not having enough time to discuss their child's symptoms with treating clinicians (p=0.0022), and disagreed that it is not necessary to treat their child's symptoms as they will go away (p=0.04). We anticipate completing the recruitment by the end of 2023.

QOL-10. TREATMENT-INDUCED LEUKOENCEPHALOPATHY IN PEDIATRIC MEDULLOBLASTOMA SURVIVORS AND ITS IMPACT ON LONG-TERM NEUROCOGNITIVE FUNCTIONING

Lukas Wägner[1], Brigitte Bison[2,3], Anne Neumann-Holbeck[1], Tanja Tischler[1], Anika Guiard[4], Denise Obrecht[1], Holger Ottensmeier[5], Rolf-Dieter Kortmann[6], Katja von Hoff[7], Paul-Gerhardt Schlegel[8], Marc Remke[9], Antje Redlich[10], Ursula Holzer[11], Claudia Blattmann[12], Gudrun Fleischhack[13], Annette Sander[14], Norbert Jorch[15], Martina Becker[16], Michael Karremann[17], Michael C. Frühwald[18], Miriam van Buiren[19], Nina Struve[20,21], Monika Warmuth-Metz[22,3], Stefan Rutkowski[1], Martin Mynarek[1,21]; [1]Pediatric Hematology and Oncology, University Medical Center Hamburg-Eppendorf, Hamburg, Germany. [2]Department of Neuroradiology, University Hospital Augsburg, Augsburg, Germany. [3]Neuroradiological Reference Center for the Pediatric Brain Tumor (HIT) Studies of the German Society of Pediatric Oncology and Hematology, since [2021] University Hospital Augsburg, Augsburg, until [2020] University Hospital Wuerzburg, Wuerzburg, Germany. [4]Department of Hematology Oncology, University Children´s Hospital Rostock, Rostock, Germany. [5]Department of Pediatric Hematology and Oncology, University Children's Hospital Wuerzburg, Wuerzburg, Germany. [6]Department of Radiation Oncology, University of Leipzig, Leipzig, Germany. [7]Department of Pediatric Oncology and Hematology, Charité - Universitätsmedizin Berlin, Berlin, Germany. [8]University Children's Hospital Wuerzburg, Wuerzburg, Germany. [9]Department of Pediatric Oncology, Hematology, and Clinical Immunology, University Hospital Duesseldorf, Duesseldorf, Germany. [10]Pediatric Oncology, Otto-von-Guericke-University Children's Hospital, Magdeburg, Germany. [11]Department of Hematology and Oncology, University Children's Hospital Tuebingen, Tuebingen, Germany. [12]Department of Pediatric Oncology/Hematology/Immunology, Stuttgart Cancer Center, Olgahospital, Stuttgart, Germany. [13]Pediatrics III, Pediatric Oncology and Hematology, University Hospital Essen, Essen, Germany. [14]Department of Paediatric Haematology and Oncology, Hannover Medical School, Hannover, Germany. [15]Children Hematology and Oncology, Bethel, Bielefeld, Germany. [16]Pediatric Hematology and Oncology, Goethe University Frankfurt, Frankfurt am Main, Germany. [17]Department of Pediatrics, University Medical Center Mannheim, Medical Faculty Mannheim, Heidelberg University, Mannheim, Germany. [18]Pediatric and Adolescent Medicine, University Hospital Augsburg, Augsburg, Germany. [19]Department of Pediatric Hematology and Oncology, Center for Pediatrics, Medical Center, Faculty of Medicine, University of Freiburg, Freiburg, Germany. [20]Department of Radiotherapy, University Medical Center Hamburg-Eppendorf, Hamburg, Germany. [21]Mildred Scheel Cancer Career Center HaTriCS[4], University Medical Center Hamburg-Eppendorf, Hamburg, Germany. [22]Department of Neuroradiology, University Hospital Wuerzburg, Wuerzburg, Germany

OBJECTIVES: Leukoencephalopathy (LEP, i.e. white matter T2-/FLAIR-hyperintensities on MRI) and impaired neuropsychological outcome are side effects of multimodal therapy of medulloblastoma. We identified risk factors for LEP and correlated LEP with neurocognitive functioning. PATIENTS AND METHODS: Severity of LEP either at the end of therapy (n=118), two years (n=126), or five years after surgery (n=139) was evaluated according to an adapted Fazekas classification for 162 survivors of medulloblastoma (median age: 7.4 years [range:0.67-19.8 years]). Severity of LEP two or five years after surgery was correlated with treatment and neurocognitive functioning ≥ five years after diagnosis using univariate analyses and multivariate generalized mixed linear models. RESULTS: Two and five years after surgery, incidences of mild/moderate/severe LEP were 21.4%/17.5%/9.5%, and 24.5%/23.7%/8.6%, respectively. Data on severity of LEP both at the end of therapy and five years after surgery was available for 103 patients: LEP grades increased for 1/2 degrees in 18/4 patients and decreased in 13/1 patients, respectively. Both treatment approaches - HIT-SKK chemotherapy including intraventricular methotrexate (SKK) and craniospinal irradiation (CSI) - were associated with increased severity of LEP (CSI+SKK > SKK only > CSI only; p<0.001). Severe LEP only occurred in patients treated with both CSI and SKK. In total 19% of all patients treated with this combination developed severe LEP. Severe LEP correlated with impaired fluid (p=0.013) and crystalline (p=0.012) intelligence and short-term memory (p=0.024) on both univariate level and in multivariate mixed linear models. Among patients treated with CSI doses >30Gy, severe LEP, but not SKK including intraventricular MTX, correlated with impaired neurocognitive functioning. CONCLUSION: After therapy strong changes in LEP rarely occurred. Severe LEP was associated both with the combination of SKK and CSI, and impaired neurocognitive functioning. Further research will be needed to weigh potential benefits of SKK including intraventricular methotrexate with CSI against its neurotoxicity.

QOL-11. COMPARISON OF NEUROPSYCHOLOGICAL FUNCTIONING IN PEDIATRIC POSTERIOR FOSSA TUMOR SURVIVORS: MEDULLOBLASTOMA, LOW-GRADE ASTROCYTOMA, AND HEALTHY CONTROLS

Cara Levitch[1], Alice Ann Holland[2], Jesse Bledsoe[3], Soo Young Kim[1], Marie Barnett[1], Sameera Ramjan[1], Stephen Sands[1]; [1]Memorial Sloan Kettering, New York, New York, USA. [2]Childrens Medical Center Dallas, Dallas, Texas, USA. [3]Seattle Childrens Hospital, Seattle, Washington, USA

BACKGROUND: Neuropsychological comparison of medulloblastoma (MB) and cerebellar low-grade astrocytoma (LGA) survivors to controls can clarify treatment-related neurocognitive late effects. While both brain tumor groups undergo surgery to the posterior fossa, children with MB additionally receive craniospinal irradiation with boost and chemotherapy. This study provides an updated comparison of neuropsychological functioning in these two groups and examines effects of demographic risk factors upon outcomes. PROCEDURE: Forty-two children (16 MB, 9 LGA, 17 controls) completed measures of intellectual functioning, verbal learning/memory, visual-motor integration, and fine motor functioning. The effects of age at diagnosis, time since diagnosis, gender, fatigue, and social status on neuropsychological functioning were examined. RESULTS: MB survivors demonstrated the worst neurocognitive late effects, but they were less severe and extensive than in prior studies. LGA survivors' mean scores were below normative expectations in working memory, processing speed, and fine motor functioning. Additionally, parents of LGA survivors reported the most difficulty with behavior and cognitive regulation compared to healthy controls and medulloblastoma survivors. In this overall sample, processing speed difficulties were independent of fine motor functioning and fatigue. Higher parental education was associated with better intellectual functioning, working memory, delayed recall, and visual-motor integration. Neuropsychological function was not associated with gender, age at diagnosis, or time since diagnosis. CONCLUSION: The results support that contemporary treatment approaches with craniospinal irradiation plus boost and chemotherapy confer the greatest risk for late effects, while surgical resection is associated with subtle but important neurocognitive difficulties. Ultimately, this study furthers our understanding of factors impacting neuropsychological function in pediatric MB and LGA survivors and contributes to empirical support for close monitoring and targeted interventions into survivorship.

QOL-12. RELAXATION TECHNIQUE OF IMAGERY BASED STORY TELLING REDUCES MANIFESTATION OF ANXIETY IN CHILDREN AND ADOLESCENTS UNDERGOING BRAIN TUMOR SURGERY

Christina Goßler[1], Tilmann Schweitzer[1], Jürgen Krauß[1], Oliver Andres[2], Stefan Mark Rueckriegel[1]; [1]Department of Neurosurgery, Division of Pediatric Neurosurgery, University Hospital Wuerzburg, Wuerzburg,

Bavaria, Germany. [2]Department of Pediatrics, University Hospital Wuerzburg, Wuerzburg, Bavaria, Germany

Children and adolescents undergoing surgical resection of brain tumors are prone to marked psychologic burden. Especially fear of surgery and its consequences like pain or neurologic sequelae is an important issue. Techniques of relaxation might reduce the intensity of the experienced anxiety and therefore might improve quality of life. In this study, we aimed at determining the effect of a standardized imagery story telling on experienced anxiety as quantified by the questionaire KAT III and cardiac frequency (CF) before and after intervention at two time points (before and after surgery). 12 patients (age: 6-17 years) undergoing brain tumor resection were included in the study. KAT III-scores and CF were determined and compared before and after interventions using a dependend t-test. Mean KAT III-score before first intervention was 0.23 (SD: 0.23), while it was 0.15 (SD: 0.21) after (p = 0.11). Mean KAT III-score before second intervention was 0.11 (SD: 0.13), after: 0.05 (SD: 0.9), p = 0.07. Mean CF before first intervention was 77.1 (SD: 10.3), after: 68,36 (SD: 6.8), p = 0.003. Mean CF before second intervention was 71.67 (SD: 9.57), after: 65 (SD: 8.72), p = 0.003. CF was significantly lower post-interventionally after the first and the second intervention. KAT III-score showed a trend to be lower post-interventionally after the second intervention. Hence, our study points at an efficacy of the deployed relaxation technique of imagery story telling in children and adolescents undergoing brain tumor surgery, although it was limited by a small patient number. Further studies with larger patient numbers and a comparison of randomized intervention vs. non-intervention groups are warranted.

QOL-13. IMPACT OF HEARING LOSS ON NEUROPSYCHOLOGICAL FUNCTIONING IN CHILDREN TREATED FOR MEDULLOBLASTOMA: A REPORT FROM THE CHILDREN'S ONCOLOGY GROUP (COG)

Leanne Embry[1], Kristina Hardy[2,3], Etan Orgel[4,5], Yu Wang[6], Jeff Michalski[7], Yimei Li[6], Patricia Cullen[8], Paul Colte[9], Johnnie Bass[6]; [1]University of Texas Health Science Center, San Antonio, TX, USA. [2]Children's National Hospital, Washington, DC, USA. [3]George Washington University School of Medicine, Washington, DC, USA. [4]Children's Hospital of Los Angeles, Los Angeles, CA, USA. [5]University of Southern California, Los Angeles, CA, USA. [6]St. Jude Children's Research Hospital, Memphis, TN, USA. [7]Washington University in St. Louis, St. Louis, MO, USA. [8]Regis University, Denver, CO, USA. [9]Primary Children's Hospital, Salt Lake City, UT, USA

BACKGROUND/OBJECTIVE: We prospectively examined neuropsychological outcomes and ototoxicity in children with average-risk medulloblastoma. METHODS: Eligible patients included those treated on COG protocol ACNS0331 who completed audiograms at end of therapy or one-year off-therapy, and neuropsychological assessments between 2- and 5-years post-diagnosis. Conventional pure-tone audiometric evaluations (0.25-8kHz) were assigned an ototoxicity grade based on the International Society of Pediatric Oncology (SIOP) grading scale. Grade for the better hearing ear was used for analyses. Participants were divided into two groups: SIOP grade≥3 hearing loss (HL) versus SIOP grade<3. Cutoff score of 60 on BASC-2 was used to dichotomize parent-reported anxiety and depression scores as 'low' or 'high'. RESULTS: Data were available for 113 children (66% male; 86% white), aged 3.0-18.5 at diagnosis (Mean=9.1). One-quarter (24.8%, n=28) had at least moderate HL (≥ SIOP grade 2), and 12.3% (n=14) had severe HL (≥ SIOP grade 3). After controlling for radiation exposure and age, children with severe HL showed significantly higher levels of anxiety (OR=5.9, 95%CI 1.3-26.0, p=0.0195) and borderline differences in depression (OR=4.0, 95%CI 1.0-16.5, p=0.0563), but no differences in cognitive functioning when compared to other participants. When moderate and severe HL were combined in exploratory analyses, significantly greater anxiety (OR=9.0, 95%CI 2.1-37.4, p=.0027) and depression (OR=4.6, 95%CI 1.3-15.7, p=.0165) were observed. CONCLUSIONS: Survivors of pediatric medulloblastoma with moderate to severe HL evidenced greater psychosocial, but not neurocognitive, difficulties compared to those with no or mild HL. It may be that modern treatment protocols generally preserve cognitive functioning such that associations between HL and cognitive impairment are no longer significant. It is also possible that neurocognitive risk associated with HL may not manifest until survivors are further from diagnosis. In contrast, survivors with HL may be at greater risk for negative psychosocial adjustment, suggesting that increased monitoring of mental health outcomes is warranted.

QOL-14. LONG TERM NEUROCOGNITIVE AND PSYCHOSOCIAL OUTCOMES AMONG ADOLESCENTS AND YOUNG ADULTS SURVIVORS OF PAEDIATRIC BRAIN TUMOUR.

Sonia Di Profio[1], Sara De Giuseppe[1], Sabrina Robotti[1], Miriana Uccello[1], Marco Crocco[2], Antonio Verrico[2], Gianluca Piccolo[3,2], Camilla Satragno[4], Claudia Milanaccio[2], Cristina Venturino[1], Maria Luisa Garrè[2]; [1]Clinical Psychology Unit- IRCCS Istituto Giannina Gaslini, Genoa, Italy. [2]Neuroncology Unit - IRCCS Istituto Giannina Gaslini, Genoa, Italy. [3]Department of Neurosciences, Rehabilitation, Ophthalmology, Genetics, Maternal and Child Health (DINOGMI), University oh Genoa, Genoa, Italy. [4]Department of Healt Sciences (DISSAL), University of Genoa, Genoa, Italy

PURPOSE: The aim of the study was to describe neurocognitive and psychological outcomes among adolescents and young adults (AYA) survivors of paediatric brain tumour (BT). METHODS: neurocognitive and psychological assessment of 45 AYA (M = 30; F = 15), treated for paediatric BT at our institution between 1978 and 2018, were retrospectively collected. Survivors received psychological and neurocognitive assessment at a mean age of 21.4 years (range 15.11-39.4) after a median of 120 months from diagnosis. The assessment was carried out using the following self-report questionnaires: Beck Depression Inventory, State-Trait Anxiety Inventory, Body Uneasiness Test, Multidimensional Fatigue Inventory, European Organization for the Research and Treatment of Cancer Quality of LifeQuestionnaire. Neurocognitive evaluation was carried out using Wechsler Adult Intelligence Scale. RESULTS: 18/45 survivors had received a diagnosis of germ cell tumor, 12 of low grades glioma, 10 of embryonal tumor, 3 of high-grade glioma, 2 of meninges and mesenchymal tumor. Thirty-four patients received neurosurgery, 34 patients chemotherapy, 44 patients cranial radiotherapy. Fatigue was reported in 56% of the patients, 15% of them also showed low level of QoL. The psychological assessment showed clinical levels of anxiety in 56% of AYA, depression in 41% and body image problems in 29%. Neurocognitive assessment showed that 73% has an average tIQ (tIQ ≥ 80). CONCLUSIONS: The psychological evaluation showed that 77% of our cohort had at least one clinically significant distress symptom as fatigue, depressive symptoms, anxiety and body image problems, compared to 23% who did not report any problem. Further analysis is needed to identify any possible psychopathological risk factors. It is essential to provide an accurate and comprehensive assessment and effective psychological support to these patients, to help them better manage the late effects of cancer and therapies at different levels: physical, psychological and neurocognitive.

QOL-15. LIFE HAPPENS WHEREVER YOU ARE! USE OF AVATAR AV1 TO ENHANCE HEALTH-RELATED QUALITY OF LIFE, SENSE OF BELONGING AND SOCIAL INCLUSION IN CHILDREN AND ADOLESCENTS WITH CHRONIC ILLNESSES

Thomas Pletschko[1], Clarissa Pelzer[1], Martin Röhsner[2], Gerda Rockenbauer[3], Agnes Turner[4]; [1]Comprehensive Center for Pediatrics, Medical University of Vienna, Vienna, Austria. [2]Die Berater, Vienna, Austria. [3]Vienna Hospital School, Vienna, Austria. [4]University of Klagenfurt, Klagenfurt, Austria

BACKGROUND: Due to regular hospital check-ups, inpatient treatments, or a weakened immune system, children with brain tumors experience frequent and long absences from school and social activities. Returning to school presents a challenge for these patients, as they experience reduced health-related quality of life (HRQOL), decreased sense of belonging and a lack of social inclusion in class. To prevent social and emotional problems, telepresence systems such as the Avatar AV1 are described as promising approach for pediatric patients. OBJECTIVES: To sustainably improve social inclusion in times of illness-related absence for these patients, the first study in Austria investigating effects of the use of the Avatar is pursuing both, a qualitative and quantitative approach. METHODS: To examine effects on social inclusion, sense of belonging and HRQOL in pediatric patients, interviews were conducted with patients, their parents, teachers and classmates within the qualitative approach and questionnaires were administered at three times (before -, after 6 months Avatar-use and 3 months after returning the Avatar) within the quantitative approach. The sample consists of pediatric patients (6 to 18 years). RESULTS: Categories from n=24 interviews indicate that a positive attitude towards and identification with the Avatar as well as the patients' psychological condition and social inclusion into class before the illness play major roles. Preliminary findings from the ongoing longitudinal quantitative survey indicate that the Avatar has significant positive and stabilizing effects on HRQOL, sense of belonging and social inclusion of pediatric patients. CONCLUSION: This study is the first to describe the impact of Avatar use on social inclusion in children with brain tumors. To strengthen the sense of belonging in these children, the pedagogical-interactional component needs to be brought in focus. Through pedagogical-didactical adaptions, a routine handling of and a positive attitude towards the telepresence system, pediatric patients highly benefit from the Avatar.

QOL-16. A 6-YEAR LONGITUDINAL STUDY OF NEUROCOGNITION IN CHILDREN TREATED FOR A BRAIN TUMOR

Kristien Bullens[1], Charlotte Sleurs[1], Linde Van den Wyngaert[2], Karen Vandenabeele[2], Trui Vercruysse[2], Laura Claeys[2], Sofie Prikken[2],