for all patients for fluid and crystallized intelligence, selective attention, visual-spatial processing (VSP) and verbal short-term memory (median=93-103), but distinctly below for processing speed (PS), and psychomotor speed abilities (PMS) (median=65-84). Higher doses of craniospinal irradiation (>23.4Gy/23.4Gy) resulted in lower scores for most domains for MB-patients compared to LGG-patients (e.g., PS-estimate: >23.4Gy:-27.71, p=0.026/23.4Gy:-9.93, p=0.286). EP-patients (surgery+54Gy local radiation) scored better than LGG-patients except for PS (estimate:-15.65, p=0.111). Impairments were accentuated with higher degrees of hydrocephalus (estimate:-7.64, p=0.103) in patients with incomplete resection (estimate:12.23, p=0.006) for PMS both hands. **CONCLUSION**: Following age-adapted comprehensive treatment, survivors of a cerebellar tumor show significant impairments of PMS abilities in our trials. Our data suggest that slow growing LGG impair neurocognitive development more than local radiotherapy for ependymoma, while craniospinal irradiation compromises VSP and PS in MB. Initial symptomatic intracranial pressure remains a strong predictor for general neuropsychological impairment.

QOL-05. CARDIORESPIRATORY FITNESS AND HEALTH-RELATED QUALITY OF LIFE AMONGST SURVIVORS OF CHILDHOOD CENTRAL NERVOUS SYSTEM TUMOURS.

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INTRODUCTION: Due to recent advancements in surgical techniques, imaging and adjuvant therapies, survival rates for children with central nervous system (CNS) tumours have improved. Research priorities have now shifted to focus on late-effects and quality of survivorship amongst childhood CNS tumour survivors. Our study aimed to assess levels of cardiorespiratory fitness and health-related quality of life (HRQoL) amongst survivors of childhood CNS tumours. A secondary aim was to investigate potential relationships between cardiorespiratory fitness and HRQoL. METHODS: Participants were recruited from the National Children's Cancer Service in CHI Crumlin. Inclusion criteria included: diagnosis of a primary CNS tumour, aged between 6-17 years, between 3 months and 5 years post completion of oncology treatment, independent mobility, deemed clinically appropriate to participate by treating oncologist. Cardiorespiratory fitness was assessed using the six-minute walk test. HRQoL was assessed with the PedsQL Generic Core Scales, Version 4.0, both self-report and parent proxy report forms were used. RESULTS: 20 participants (n=9 male) were recruited with a mean age of 12.34 (SD = 3.46) years. Mean time since completion of oncology treatment was 2.31 (SD = 1.38) years. Mean 6-minute walk distance (6MWD) was 482.75 (SD = 50.04) metres, equating to the 5.55th (SD = 6.83th) percentile overall. 6MWD was significantly reduced compared to predicted 6MWD (t = -12.52, p <.001, 95% CI [-163.52, -116.68]). Parent proxy-reported HRQoL was significantly reduced compared to healthy population norms (t = -5.82, p <0.001, 95% CI [-25.76, -12.17]). A strong positive correlation exists between 6MWD and both parent-proxy (Pearson's r = 0.533, p = 0.015) and child-reported HRQoL (r = 0.580, p = 0.007). **CONCLUSION**: Survivors of childhood CNS tumours present with impaired levels of cardiorespiratory fitness and HRQoL compared to healthy population norms. Higher levels of cardiorespiratory fitness are associated with higher levels of HRQoL.

QOL-06. WHAT IMPACT DOES A POSTERIOR FOSSA TUMOR IN CHILDHOOD HAVE ON MOTOR PROCEDURAL LEARNING? GROUP PERFORMANCE DEPENDING ON RADIOTHERAPY STATUS AND INDIVIDUAL DIFFERENCES ON A PERCEPTIVO-MOTOR SEQUENCE LEARNING TASK AND A MOTOR ADAPTATIVE TASK (IMPALA PROSPECTIVE STUDY)

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INTRODUCTION: Procedural memory (PM) is a skill learning system that allows, through training, the automatization of procedures and progressive improvement of performances. The aim of this work was to explore the impact of a posterior fossa tumor (PFT) on PM. We hypothesized that motor adaptation, depending on cortico-cerebellar system, was impaired in PFT survivors treated with and without radiotherapy, and motor sequence learning, depending on cortico-striatal system, was only impaired in PFT treated with radiotherapy. METHODS: We investigated PM in 60 participants from the IMPALA study (NCT04324450) divided into three groups: 39 cured from a PFT in childhood (22 irradiated (PFT+RT group) and 17 non-irradiated (PFT group)) and 21 healthy volunteers (Control group) matched on age, sex and handedness with the PFT+RT group. We used a visuo-motor learning test, the Serial Reaction Time task (SRTT) and a motor adaptation task (MAT) of backwards handwriting. ANOVA and mixed models were used for statistical analysis. RESULTS: SRTT performance analysis showed an effect of Block in specific sequence learning (F(1)48.70,p<0.001) with a preserved specific learning in the three groups. However individual differences were observed with 7/22 patients in PFT+RT group and 4/17 in PFT group who did not have specific learning. MAT performance analysis showed an effect of interaction between Orientation (forward or backward) and Group for speed (F(2)15.58,p<0.001), linearity (F(2)8.39,p<0.001) and amplitude standard deviation (F(2)15.70,p<0.001) traducing an impairment both in PFT+RT and PFT groups, more marked in the PFT+RT group. CONCLUSION: We showed impairment, predominantly on motor adaptation but also, at individual level, in motor sequence learning whose origin requires additional work. This study brings new insights on the long-term impact of a PFT in childhood on a rarely investigated part of memory that is PM.

QOL-07. THE IMPORTANCE OF AN ONCO-FERTILITY PROGRAM FOR PEDIATRIC NEURO-ONCOLOGY PATIENTS

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INTRODUCTION: In the Netherlands pediatric oncology care is centralized in one hospital since 2018. 600 new patients a year are seen with 100-120 new neuro-oncology (NO) patients. Of the NO patients 20-25% classify as high risk for infertility (HR) such as patients with medulloblastoma, ependymoma, ATRT and germinoma . An onco-fertility program was started navigated by a nurse-practitioner. The program runs with intense collaboration between the different specialties. All new patients are identified according to the international guidelines on fertility care. The fertility-risk is based on the CED score (cyclofosfamide equivalent dose) and radiotherapy dose. Since 2018 awareness was created by teaching sessions among colleagues, nursing staff, and parent association organizations. METHODS: All HR children are informed by the nurse-practitioner and can be referred for counseling to gynaecology for OTC (ovarian tissue cryopreservation) or urology for sperm cryopreservation or testicular biopsy. Monthly the onco-fertility working-group members discuss cases and research in the field. RESULTS: In 2019, 19% NO cases and in 2020 18% of cases were HR for infertility. In both years 36% of these cases had fertility preservation performed. In 2021, 22% cases HR were identified and in 55% preservation was performed. Reasons for not preserving fertility were diverse, varying from poor prognosis, or too ill to be included. CONCLUSION: Awareness of the fertility risk in NO patients who are HR is necessary. These patients need to be informed, and stratified for counseling and offered fertility preservation before start of their treatment. An active onco-fertility program helps to offer the best option for future fertility for these patients

QOL-08. VISUAL MEMORY AND POTENTIAL CLINICAL RISK FACTORS IN LONG-TERM SURVIVORS OF A CHILDHOOD BRAIN TUMOR

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A brain tumor treatment has previously been associated with long-term neurocognitive sequelae. However, clinical profiles differ between certain patient subgroups. We investigated the impact of tumor location, radiotherapy (RT), and age at diagnosis in childhood brain tumor survivors on long-term cognitive outcomes. Adult survivors (n=32) of pediatric brain tumors (n=11 infratentorial, n=21 supratentorial; 14 astrocytomas, 3 craniopharyngiomas, 2 ependymomas, 2 germinomas, 1 hemangioblastomas, 4 medulloblastomas, 6 nervus opticus gliomas) participated in this neuropsychological study (n=11 RT) (16.8-35.1 years old, >2years after treatment, mean age at diagnosis = 9.2 years, 50% male). An extensive neurocognitive test battery was used to assess intelligence scales (n=5), verbal and visual memory (n=2), and language (n=3). In order to investigate the effects of tumor location (infra- versus supratentorial), RT (yes vs. no), and age at diagnosis on the cognitive scores, a multivariate ANCOVA model was tested including the main effects and interaction between age and RT. Of all included scales, only visual memory was significantly associated with the risk factors. More specifically, patients who received RT (F=10.3, p=.004) and were younger at diagnosis (F=6.9, p=.014) scored worse on this task. Furthermore, the interaction effect between these factors was also significant (F=8.8, p=.006). These findings suggest that younger patients could be more vulnerable to the radiotoxic effects to visual memory outcomes. Tumor location (supra- vs. infratentorial) was not significantly associated with any outcome. In this study, only visual memory appeared to be associated with the risk factors of interest. Both radiotherapy and

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

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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

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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

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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

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