

reported in 25 patients, 7 of them also showed low level of psychosocial and school QoL. The psychological assessment showed clinical levels of emotional distress in 10 children due to increase in anxiety, depression and social problems. CONCLUSIONS: Our preliminary data regarding late effects in childhood BT survivors show that fatigue affects 47% of them. This symptom, not always can be predicted by NES status. QoL was overall good although it worsens with the increase of NES. Further studies will be performed in order to better comprehend the relationship among risk factors and psychosocial outcome.

QOL-42. BETTER SOCIAL, COGNITIVE, AND ACADEMIC OUTCOMES AMONG PEDIATRIC BRAIN TUMOR SURVIVORS TREATED WITH PROTON VERSUS PHOTON RADIATION THERAPY

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INTRODUCTION: Proton beam radiotherapy (PBRT) reduces exposure of healthy tissue to radiation, which may minimize late effects in pediatric brain tumor patients. This study compared social, cognitive, and academic outcomes in children treated with PBRT versus photon radiotherapy (XRT). METHODS: Survivors who were >1 year post-radiation ($M=6.5$, $SD=3.27$ years) completed cognitive (processing speed, working memory, language, attention, executive function, memory) and academic (reading, writing, math fluency) testing. Parents completed questionnaires assessing survivors' social functioning. RESULTS: XRT ($n=29$) and PBRT ($n=54$) groups did not differ on demographic/clinical variables (68.7% male, M age-at-treatment=7.8 years, 51.8% infratentorial tumor, 55.0% craniospinal RT, median RT dose to tumor=54.0 Gy), except for age-at-evaluation (PBRT $M=13.23$ years, XRT $M=16.39$ years; $p=0.01$) and follow-up interval (PBRT $M=5.05$ years, XRT $M=8.59$ years; $p<0.01$). Tumor types included: 21.7% glioma, 38.6% PNET/medulloblastoma, 13.3% ependymoma, 15.7% germ cell, 10.8% other. The PBRT group performed within normal limits ($\pm 1SD$) on most cognitive measures, while the XRT group performed $< 1SD$ on measures of working memory, language, executive function, and memory. Both groups performed $< 1SD$ on measures of processing speed and motor dexterity. On ANCOVA tests, controlling for group differences on age-at-evaluation and follow-up interval, survivors treated with PBRT outperformed those treated with XRT on all cognitive ($p<0.001$ to 0.032) and academic tasks ($p<0.001$), except attention ($p>0.05$). The PBRT group was also rated as having better social functioning ($p<0.05$). CONCLUSIONS: Findings suggest PBRT may provide a meaningful benefit over XRT for social, cognitive, and academic outcomes in pediatric brain tumor survivors.

QOL-43. CEREBELLAR MUTISM, NEUROCOGNITIVE AND ACADEMIC OUTCOME IN A CONSECUTIVE SAMPLE OF PEDIATRIC CEREBELLAR TUMOR PATIENTS

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The Cerebellar Mutism Syndrome (CMS) is a severe complication after resection of a pediatric cerebellar tumor. Incidence rates vary and sophisticated neurocognitive and academic outcome studies are still rare. CMS is characterized by entire absence of speech for a certain time period after surgery. However, during long-term follow-up other distinct neurocognitive deficits become apparent, which have the impact to severely influence everyday life and academic achievement. Hence, the aim of this study was to investigate the long-term impact of cerebellar tumor treatment with a special focus on CMS. Therefore we retrospectively analyzed a consecutive sample of $n=105$ pediatric cerebellar tumor patients, all treated at the Medical University of Vienna between 2001 and 2015. Most common histologies were pilocytic astrocytoma (45.7%), medulloblastoma (31.4%) and ependymoma (13.3%). Eight patients were diagnosed with CMS (incidence rate = 7.6%). All patients underwent a comprehensive standard-of-care neuropsychological test-battery. Median time between diagnosis and follow-up assessment was 4 years. All patients suffering from postoperative CMS needed a special form of academic/occupational support at the time of assessment, compared to only 33% in the total sample. Regarding neurocognitive functioning, CMS patients showed significantly lower results in certain cognitive domains (e.g. divided attention, information processing speed). In conclusion, patients with CMS turned out to be a high-risk-

group regarding neurocognitive late-effects, which in turn affect academic achievement and the need for special support services. Moreover, the results indicate the need for deficit-specific neurocognitive therapy and counselling, for pediatric cerebellar tumor patients in order to overcome illness-related academic disadvantages.

QOL-44. NEW APPROACHES OF ONCOLOGY REHABILITATION IN CHILDREN: TECHNOTHERAPY – SYSTEMATIC LITERATURE REVIEW

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PURPOSE: Oncology rehabilitation improves health outcomes variety in survivors. Less is known about the components of rehabilitation essential for improving outcomes. Study purpose was to update evidence based technotherapy in pediatric oncology rehabilitation by systematically examining literature. METHOD: PRISMA statement conduct review was followed. Two authors (IK, MT) independently conducted systematic literature searches January 2018, using electronic databases: PubMed, Cochrane, PEDro, published 1982-2018. Keywords/Mesh terms: “pediatric, childhood, neurooncology, brain tumors, central nervous system tumors, glioma, astrocytic tumors, medulloblastoma, posterior fossa tumors, technotherapy, physiotherapy, rehabilitation, augmented reality-virtual reality (VR), exergaming, Nintendo, Xbox, active video gaming”. Randomized controlled English clinical trials are included; Studies that were published as “review”, “protocol”, “books”, “news”, not reach full text and not related physiotherapy excluded. After articles had been reached, used QUADAS-2 checklist for methodological quality. RESULTS: 96 articles were identified, 4 (published 2014-2018) met eligibility criteria, selected for present systematic review: physical activity, body coordination, psychosocial intervention and cognitive efficacy. Evaluation methods; Movement Assessment Battery for Children, German motor performance, Grooved Pegboard, PedsQL Multidimensional Fatigue Scale, Kidscreen-Health Related Quality of Life, Short version of physical self-description and Behavior Rating Inventory of Executive Function. “Nintendo Wii” and “X-Box Kinect” were used in treatments. Treatments; 30-47minutes, 24-60sessions, 8-12weeks. CONCLUSIONS: VR exercises have similar functional development effects with conventional, more useful than biopsychosocial with motivational effects. Guideline for subject, evaluation and treatment methods not clearly expressed. Methodological work homogeneous participants, which exercises can chosen specific way. Now very few intervention studies with pediatric cancer survivors have been published. Investigation of different training methods in a group of children in need of support is major importance.

QOL-45. PROFILES OF EXECUTIVE FUNCTIONS IN SURVIVORS OF PEDIATRIC BRAIN TUMOR. A COMPREHENSIVE APPROACH

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Executive functions (EF) are a collection of distinct but related high-level processes, of major importance during development. They are frequently impaired following childhood brain tumors, with negative consequences on academic achievement and overall independence. This study aimed at performing a comprehensive assessment of EF domains, using a combination of performance-based tasks and a daily life questionnaire. We developed a novel test battery (FEE), based on Diamonds' developmental framework of EF (2013), comprised of 10 subtests assessing flexibility, inhibition, working memory, and planning, controlling for lower level processes (i.e. language, visual-spatial skills). Outcome measures include different performance indicators (e.g. number of errors, time...). Twenty-seven children treated for various brain tumors and 27 matched healthy controls, performed the FEE battery, as well as the parent- and teacher-ratings of the Behavior Rating Inventory of Executive Functions (BRIEF) questionnaire. The association between performance-based and rating measures of EF was also examined. Patients performed significantly worse than controls on some, but not all subtests. The main finding was that overall, patients performed tasks slower than controls, without significantly more errors. Correlations between performance-based tasks and the BRIEF questionnaire were weak and not significant, as most often reported in the literature. This study allowed identification of a specific dysexecutive profile that should be confirmed in a larger sample of pediatric brain tumor survivors. These findings could lead to improvements in EF assessment, to better understanding of EF deficits basis (i.e. the cognitive cost of slow information processing) and their consequences, and development of targeted interventions.