NCMP-25. SEIZURE INCIDENCE AND CONTRIBUTING FACTORS IN PATIENTS WITH LEPTOMENINGEAL DISEASE

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INTRODUCTION: Seizures are a well-known complication of CNS malignancy, however there is little in the literature regarding leptomeningeal disease (LMD) and seizures. The incidence of seizures is unknown in this specific cohort as is the use or potential benefit of preventative anti-seizure medications (AEDs). Additionally, factors that might predispose LMD patients to seize or affect their survival are largely unexplored. METHODS: Retrospective review of 79 patients with a diagnosis of LMD treated at a single institution from August 2012 to August 2017. Associations between categorical variables were tested using Fisher's Exact tests. Differences in survival between groups were plotted with Kaplan Meier curves and tested using log-rank tests. All analyses were performed using SAS software. RESULTS: Seizure incidence in those with and without brain metastases was 22%. Of those who seized, 65% were admitted for this at least once while only one patient required intubation. Primary malignancy, type or route of chemotherapy administration, form of radiation therapy (craniospinal, focal, or whole brain), and number of brain metastases did not influence seizure development. Only 8% of patients who never had seizures were on a prophylactic AED. In patients who had brain metastasis, there was no significant difference in incidence of seizure before vs after LMD diagnosis suggesting that LMD does not significantly increase the risk of seizure compared to brain metastasis alone. There was additionally no significant difference in survival time between patients who did or did not seize. Median survival time of patients after LMD diagnosis was 4 months. CONCLUSION: The incidence of seizure in LMD patients is 22%. There were no statistically significant predisposing factors to seizure development. Additionally, the development of seizures does not affect survival in patients with LMD.

NCMP-26. STROKE-LIKE MIGRAINE ATTACKS AFTER RADIATION THERAPY SYNDROME IN CHILDREN WITH CANCER

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BACKGROUND: Stroke-like migraine attacks after radiation therapy (SMART) syndrome is an infrequently described symptom complex of transient neurologic deficits, headache and abnormal cortical contrast enhancement on brain MRI. Pathophysiology is unclear, but exposure to cranial radiation (RT) is a sine qua non. METHODS: We completed a single institution retrospective case series composed of five children with a diagnosis of cancer, history of cranial RT, and episodes of transient neurologic deficits. RESULTS: Five children (2 males, 3 females) fulfilled diagnostic criteria. Tumors were in the posterior fossa (3 medulloblastoma, 1 atypical teratoid rhabdoid tumor) and temporal lobe (1 pleomorphic xanthoastrocytoma). Median age at diagnosis was 9.4 years (range 5.1–14.7). All patients had complete resection, followed by adjuvant 54 Gy focal RT (N=1) or 36 Gy CSI followed by a cone-down to 54 Gy (N=4), and chemotherapy. Median body mass index was 17.1 (range 14 to 30). Median time from the end of RT to first transient neurologic deficit was one year (range 0.7–12.1). Presenting symptoms included gradual development of unilateral weakness (N=4), non-fluent dysphasia (N=1), somnolence (N=1), and headaches (N=3). Neurologic deficits resolved within 30 minutes to 10 days. Transient cortical enhancement was confirmed on MRI in two patients, two had a normal brain MRI, and one had no MRI obtained. Two children had a single and three had multiple episodes over the next few months. Topiramate was successfully used in one and failed along with levetiracetam in another. Two children with protracted symptoms responded to high dose intravenous methyl prednisone for three days followed by 2 weeks of oral taper. Symptoms ultimately resolved in all patients. CONCLUSION: SMART syndrome is a rare disorder characterized by slow development of neurologic deficits with variable occurrence of abnormal cortical contrast enhancement. The use of anti-epileptics and/or steroids may improve symptoms and speed resolution.

NCMP-27. QUALITY OF LIFE IN LONG-TERM SURVIVORS OF PEDIATRIC CANCER: THE IMPACT OF HEARING LOSS

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BACKGROUND: Cisplatin chemotherapy causes irreversible hearing loss (HL) in approximately 50% of children and adolescents. We examined the association between cisplatin-induced HL and health-related quality of life (HRQOL) in a cohort of childhood cancer survivors. METHODS: Participants were ≤18 years at time of treatment, received a cumulative cisplatin dose ≥200 mg/m^2, and had at least one year between treatment completion and study enrollment. HL was graded using the International Society of Pediatric Oncology Ototoxicity Scale. HRQOL was assessed with self- and parent-reported versions of the Pediatric QOL Inventory (PedsQL). A questionnaire was developed for survivors and parents to assess the use of hearing technology, communication difficulties, and educational needs. Data were analyzed using linear regression and Fisher's exact test. RESULTS: Data from 66 patients (36 M/30 F) are summarized. The median age at diagnosis was 8.8 years (range 1 month-18 years), and the age range at the time of study enrollment was 3.6–35.1 years. The average time since treatment completion was 9 years (range 1.5–22 years). Diagnoses included medulloblastoma (39%), osteosarcoma (27%), neuroblastoma (14%), hepatoblastoma (8%) and other (12%). At the end of treatment 27% had no HL while 38% had mild HL and 35% had severe HL. Self- and parent-reported HRQOLs were strongly associated ($P < 0.0001$) and there were no differences in HRQOL among HL groups. However, survivors with severe HL more frequently reported speech and language delay ($p<.01$), learning disability ($p<.05$), limitation in activities ($p<.01$), and need for special education ($p<.01$). CONCLUSIONS: In this large cohort of long-term childhood cancer survivors, severe HL was significantly associated with communication and learning difficulties and need for educational supports, but not with HRQOL as measured by the PedsQL.

NCMP-28. PTPRZ1-MET SIGNALING PROMOTES GLIOMA PROGRESSION THROUGH STIMULATION THE TRANSFORMATION FROM M1 TO M2 MACROPHAGE

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INTRODUCTION: Tumor-associated macrophages (TAMs) have multiple functions in both inhibiting or promoting diversity tumors progression and correlated with increased intratumoral heterogeneity. PTPRZ1-MET (ZM) fusion has been implicated in the development of glioma and recently associated with an unfavorable prognosis for afflicted secondary glioblastoma (sGBM) patients, as well as temozolomide chemoresistance. The underlying mechanisms of ZM fusion and TAM in glioma still remain undefined. METHODS: SsGSEA is a rank-based method that computes an overexpression measure for a gene list of interest relative to all other genes in the genome. The ssGSEA scores for M1-type and M2-type macrophage scores are standardized across all tumor with known M1-type and M2-type macrophage properties in previous reports. The influence of ZM fusion on macrophage conversion in glioma was explored by performing gene set enrichment analysis and in vitro and in vivo experiments. An orthotopic xenograft model was established in this study. RESULTS: Here, we first show that the ssGSEA score of M2-type macrophage is upregulated in ZM fusion positively gliomas and M2-type macrophage score is highly associated with glioma patient overall survival. Further studies illustrated that the abundant macrophages populations and M1–M2 polarization of macrophage are tightly controlled processes of the hyper-activation of PTPRZ1-MET signaling in vitro and in orthotopic xenograft model. Meanwhile, our data also indicate that distinct transcriptional networks in brain-resident microglia and recruited bone-marrow-derived macrophages (BMDMs) are influenced by PTPRZ1-MET signaling pathway. CONCLUSION: These data indicate that PTPRZ1-MET signaling contribute to glioma malignant progression by recruiting macrophages and facilitating M2-type to M1-type macrophages conversion and therefore provide a novel therapeutic target for the treatment of sGBM patients.

NCMP-29. CEREBRAL EDEMA FROM RAPIDLY PROGRESSIVE METASTATIC CNS ATRT AND CHEMOTHERAPY INDUCED TUMOR LYSIS

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INTRODUCTION: Young pediatric patients with Central Nervous System (CNS) Atypical Teratoid Rhabdoid Tumor (ATRT) often present with metastasis and have extremely poor prognosis with the 2-year event-free survival of 11% or less. We report a case of metastatic CNS ATRT with literature review. RESULTS: A 22-month-old girl presented with subacute onset ataxia, vomiting, weight loss, headaches, motor and speech regression followed by acute onset seizures. MRI brain revealed a heterogeneously enhancing solid-cystic pineal mass causing hydrocephalus. Tumor biopsy confirmed ATRT, WHO grade IV, SMARCB1/ INI1 loss CSF cytology revealed M3 disease. Germline rhabdoid predisposition syndrome was ruled out. The primary tumor was resected. Immediate postoperative MRI was concerning for further metastasis of the tumor. Chemotherapy based on