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INTRODUCTION: Primary central nervous system (CNS) germ cell tumors (GCT) account for 2–3% brain tumors children/adolescents in Western hemisphere. The report aim is to present the results of a Brazilian CNSGCT consortium protocol. **METHODS:** Since 2013, 45 patients with histologic and/or tumor marker (TM) diagnosis of germinoma with/without HCG β levels \leq 200mIU/ml (n=33), four between 100-200mIU/ml and NGGCT (n=12), received carboplatin/etoposide/cyclophosphamide (4–6 cycles), followed by 18Gy ventricular field irradiation and primary site(s) boost. Autologous bone marrow transplant (ABMT) was conducted for NGGCT low responders. **RESULTS:** Mean age 12.9 years (4.7-20y), 34 males. Diagnosis was made by TM (n=9), surgery (n=19), both (n=15). Two bifocal cases, (-)TM were treated as germinoma. Primary tumor location was pineal (n=20), suprasellar (n=13), bifocal (n=11) and basal ganglia/thalamus (n=1). Fourteen had ventricular/spinal spread. Second-look surgery occurred in 5 patients. For the germinoma group, 26 achieved complete response (CR) after chemotherapy, seven showed residual teratoma/scar. For the NGGCT after 2/4 cycles, four patients showed CR, 2 failure/progression and 6 partial response (4 (-)TM). Two were submitted to ABMT. Radiotherapy was performed as described, except in three. One recurrence to date. Two patients died (endocrinologic complications/progression). Toxicity was mostly grade $\frac{3}{4}$ neutropenia/thrombocytopenia during chemotherapy. At a median follow-up of 38 months, OS was 100% for Germinoma and 85% NGGCT. **CONCLUSION:** The treatment is tolerable and VFI dose reduction to 18Gy seems to preserve efficacy. Further follow-up is warranted to assess the NG group and the slow-responder patients.

GCT-59. EPIDEMIOLOGY OF PEDIATRIC INTRA-CRANIAL GERM CELL TUMORS: COMPARING THE INCIDENCE OF INTRA-CRANIAL GERM CELL TUMORS IN THE NATIVE JAPANESE POPULATION AND IMMIGRANT JAPANESE POPULATIONS ABROAD

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Pediatric intra-cranial germ cell tumors (iGCTs) occur at an incidence of 0.6–1.2 cases/million/year in Western countries. The incidence is reported up to 5 times higher in the Japan. It is unknown whether this increased incidence is due to tumor biology or environment. The incidence of iGCTs in children ages 0–19 years was evaluated from 12/1/96-12/1/2016 in stable Japanese immigrant populations living abroad compared to current native Japanese registry data. Medulloblastoma incidence was used as a control to account for assumptions in the data. A review of the Brain Tumor Registry of Japan from 1984–2004 revealed an incidence of 2.5 cases/million/year and a lower incidence of medulloblastoma at 1.1 cases/million/year. Sites outside of Japan included Vancouver, Canada, Lima, Peru, and San Paolo, Brazil and together included a population of 853,174 Japanese persons. Within this population, 0 cases of iGCT were identified over a 20-years. The ratio of medulloblastoma to iGCT cases in Japan was identified as 1:2 while the ratio was 2:1, 6.5:1, and 5:1, respectively, in the other three locations. The data suggests increased incidence in the native Japan may not translate to higher incidence in immigrant Japanese populations abroad and a clear genetic component was not found in this preliminary data set. A more precise and comprehensive study is needed to determine the cause of this difference in incidence. This study also emphasizes the importance of national and state registries and is a call to collaborate on state and country level epidemiology studies.

GCT-60. DEVELOPMENT OF MICROBLEEDING AFTER PROTON THERAPY FOR PATIENTS WITH GERM CELL TUMOR

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BACKGROUND: Proton therapy has been increasingly used to treat pediatric brain tumor. However, there were few reports about radiation-

induced cerebral microbleeds (CMBs) and cavernous malformation among these patients. Here we evaluate the incidence and risk factor of CMBs with MR imaging. **MATERIAL AND METHOD:** We retrospectively identified patients with germ cell tumor treated with whole ventricle irradiation of 30.6 Gy using proton therapy at the Tsukuba University Hospital between 2004 and 2017. CMBs were characterized by examination of MR imaging scan including susceptibility-weighted imaging and T2* weighted gradient-recalled echo sequence. **RESULT:** The mean age at the time of proton therapy was 14.5 years. The median follow-up duration was 62.3 months. Three patients were treated by local boost in addition to whole ventricle irradiation. CMBs were found in 78% at 5 years, and 88% at 10 years from irradiation. Over 80% of CMBs occurred in area of the brain exposed to 30 Gy. **CONCLUSION:** This study indicated over 30 Gy irradiation may become a risk factor for development of CMBs. Although the correlation between development of CMBs and cognitive function, proton therapy might have an advantage to reduce late sequelae with decreasing irradiating dose to surrounding normal brain tissue.

GCT-61. CORRELATION OF PATTERNS OF DISEASE RECURRENCE WITH RADIOTHERAPY TECHNIQUES AND DOSE IN INTRACRANIAL GERM CELL TUMOURS (ICGCT): LESSONS FROM THE UK COHORT OF SIOP GCT96 STUDY

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BACKGROUND: There are global variations in radiotherapy approaches for iGCT. An understanding of patterns of disease recurrence correlated with radiation techniques and doses is important in standardising and improving the quality of radiotherapy using high-precision techniques. **METHODS AND RESULTS:** Data from 20 patients with tumour recurrence after treatment within the SIOP GCT96 study in the UK were analysed. Seven (35%) patients had germinoma and 13 (65%) had non-germinoma. Twelve patients had local recurrence, 5 had metastatic and 3 had local and metastatic disease. Radiotherapy details were retrieved in only 8 patients (40%). Six patients had received focal radiotherapy and two craniospinal radiotherapy. Of the patients who received focal radiotherapy, 4 had recurrence within the radiation portal, one had periventricular recurrence and one had marker-positive recurrence with no radiological lesions. Both patients who received CSI recurred within the CSF space. The main reasons for poor retrieval of treatment details were difficulty in retrieving archived information and that the study was conducted during a period before PACS or electronic radiotherapy records. **CONCLUSION:** This study highlights the importance prospective data collection and analysis to understand the patterns of recurrence in iGCT. Even within a prospective study, radiotherapy techniques varied between centres. There is therefore an urgent need for centralised radiological review and prospective radiotherapy quality assurance measures in future clinical trials.

GCT-62. DISSECTING INTRATUMORAL HETEROGENEITY OF CENTRAL NERVOUS SYSTEM GERM CELL TUMORS BY SINGLE-CELL RNA-SEQUENCING

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