

severity of HC (P-value>0.05). By quantitative PCR, a viral etiology for one or more viruses was found in 40 cases (CMV, HSV& BK). HC was managed with supportive care (blood and platelet transfusion, hydration and irrigation) in all patients. 4 of the patients required surgical interventions and cystectomy. 4 years Overall survival of patients was 56%. Main cause of death were severe HC (n=11) and disease relapse (n=9).

**Conclusion:** HC is caused by the interaction of several conditions such as donor type and preparative regimen intensity. This study shows that young age correlated with a lower incidence of severe HC. A prospective study is necessary to clarify the association between clinical factors such as age in the development of severe HC following HSCT in children.

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### Radiologic Resolution of Malignant Infantile Osteopetrosis Skeletal Changes after Hematopoietic Stem Cell Transplantation

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**Introduction:** Hematopoietic stem cell transplantation (HSCT) is considered the only curative treatment of malignant infantile osteopetrosis(MIOP). This study evaluates the radiologic evolution of skeletal changes after HSCT in children with MIOP.

**Methods:** Twelve patients(8 male & 4 female, median age of 14.5 months) with proved MIOP underwent HSCT. Patients received transplant from relative matched donor(n=9), unrelated matched(n=1), unrelated mismatched cord blood(n=1) and HLA-haploidentical relative(n=1). The source of stem cell were bone marrow(n=7), peripheral blood(n=4) and cord blood(n=1). Baseline, 6th and 12th month post-HSCT whole body bone surveys were performed. All patients survived except one who died at 8 months due to infection.

**Results:** Baseline corticomedullary differentiation was not detectable in any patient, however by 6<sup>th</sup> month it was perceivable in 3(p-value: 0.25) and by 12<sup>th</sup> month in 9 patients(p-value: 0.004). Baseline endobone appearance was seen in long and flat bones of 11 and 12patients, respectively. Resolution of long bones endobone appearance was seen in 9patients by 6<sup>th</sup> month(p-value: 0.008). None of 11patients had endobone appearance by 12<sup>th</sup> month(p-value: 0.002), while flat bone endobone appearance was persistent in 10patients at 12<sup>th</sup> month. By 6<sup>th</sup> month, significant disappearance of rachitic changes in long bones was seen, however it was persistent in ribs in 11patients. By 12<sup>th</sup> month, there was not any evidence of rickets in ribs and long bones of any patient(P-values<0.005). Of all subjects with baseline skull base sclerosis, by 6<sup>th</sup> and 12<sup>th</sup> month it was persistent in 9(p-value: 0.25) and 5patients(p-value: 0.03) respectively. The mean metaphysical band to femur length ratio was significantly higher at 6<sup>th</sup> month compared to the baseline( $7.56 \pm 3.66$  vs.  $2.87 \pm 1.25$ , p-value: 0.001)

**Conclusion:** This study demonstrated the resolution in skeletal changes of osteopetrosis after successful HSCT. Long bones rachitic changes and endobone impression were the first to resolve within 6 months after HSCT.

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### Survival and Neurocognitive Outcomes Following Cranial or Craniospinal Irradiation Plus Total Body Irradiation Prior to Transplantation in Children with CNS Leukemia

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**Purpose/Objective(s):** Optimal management of pediatric acute lymphoblastic leukemia (ALL) patients with CNS involvement remains a challenge, with limited data to guide treatment. The goal of this study is to evaluate survival and neurocognitive outcomes among pediatric ALL patients with CNS involvement who underwent stem cell transplantation (SCT) and received cranial or craniospinal irradiation in addition to total body irradiation (TBI) as pre-transplant preparative regimen according to an institutional protocol.

**Materials/Methods:** A retrospective analysis was performed of pediatric ALL patients with CNS involvement who underwent SCT at our institution between 1986 and 2011. The Kaplan-Meier method was used to compute estimates of disease-free survival (DFS). Cox regression models were used to determine associations of patient and disease characteristics and treatment methods.

**Results:** Forty-one pediatric ALL patients underwent SCT with TBI as a preparative regimen and received additional cranial or craniospinal irradiation due to CNS involvement. Median age at diagnosis was 5 years (range 1 to 21 years). Twenty-six patients were standard-risk by NCI criteria, and 14 were high-risk. Five patients underwent transplant in first complete remission (CR), 25 in CR 2, and 11 in CR 3 or greater. All patients received a cranial boost; median cranial dose was 24 Gy (range 18-35.4 Gy). Eighteen patients received a spinal boost; median spinal dose for these patients was 18 Gy (range 15-24.6 Gy). Survival analysis from date of SCT revealed a 1 year DFS of 78%, 2 year 67%, and 5 year 67%. Univariate Cox regression revealed no statistically significant associations; however, omission of a spinal boost was associated with inferior DFS (HR 3.23, p=0.14). A combined CNS and bone marrow relapse prior to transplant was associated with an inferior DFS (HR 3.64, p=0.11), as compared with an isolated CNS relapse. 17/41 patients had an isolated CNS relapse, and analysis of these patients revealed a 1 year DFS of 88%, 2 year 81%, and 5 year 74%. A battery of neurocognitive testing was performed in 16 patients and at a mean of 4.4 years after transplant, mean post-transplant overall IQ was 103.7 (range 84-143). Pre and post-transplant neurocognitive testing in a subset revealed a mean overall IQ change of +4.8 points (range -1 to +9).

**Conclusions:** We show that addition of craniospinal irradiation to TBI is feasible in the preparative regimen for SCT in children with CNS leukemia and is associated with favorable DFS at 5 years post transplant, particularly in those patients with isolated CNS relapse. The use of craniospinal as opposed to cranial irradiation may be important in maximizing disease control. Post-transplant neurocognitive testing reveals average intelligence. Pre and post-transplant testing shows no change in IQ scores, though numbers remain small. CSI plus TBI is worthy of further protocol investigation.