disease and death. 2 children where TCR α/β depletion and CD3/19 selection was used died of progressive leukoencephalopathy probably of viral etiology.
Conclusions: Haploidentical stem cell transplantation is a feasible option for cure in children with lifethreatening benign disorders where no compatible family or matched unrelated donor has been found with engraftment rates of 75% and overall survival of 55%. Up to 30% can develop CMV viral reactivation and acute GVHD. PTCY in infants caused lethal neurological side effects and mortality and should not be recommended. In our series, we have had superior outcome with the use of PTCy compared to ex vivo T depletion with survival rates of 55%. The cost of the monoclonal antibodies alone is about 12 lakhs making this procedure twice as expensive compared to PTCY. Careful patient selection will improve outcomes using this simple but cost effective method of treating children with benign haematological conditions in the future.

SCT-1_V1.4
HEMATOPOIETIC STEM CELL TRANSPLANTATION IN THALASSEMIA. A SINGLE CENTER EXPERIENCE FROM INDIA

Waseem Iqbal, Sonamani Ngangbam, Shobha Badiger, Sharat Damodar, K.S. Nataraj, B.R. Prathip, Sunil Bhat. *Mazumdar Shaw Cancer Center, Narayana Health City, Bangalore, India*
E-mail address: sunilbhat_9@hotmail.com (S. Bhat).

Introduction: Thalassemias are the most common inherited single gene disorders of the hemoglobin production prevalent all across the world especially in the Thalassemia belt extending eastward from the Mediterranean to South East Asia. Although conservative management with regular blood transfusions and effective chelation have improved the short term outlook, allogeneic bone marrow transplantation provides the only option of complete cure.
Methods: We retrospectively analyzed the outcomes of patients diagnosed with Thalassemia who underwent allogeneic hematopoietic stem cell transplantation at our institute from November 2004 to July 2016.

Results: One hundred Thalassemia patients [Males n=56 (56 %); Females n=44 (44%)] with a median age of 7 years (range 2 to 24 years) underwent HSCT during this period. Seventy six (76%) were classified as Pesaro Class 2 and 18 (18%) as Class 3. Six (6%) patients were classified as Pesaro Class 1. The donor type was Matched sibling in 84 (84%), Matched Related in 2 (2%), Matched Unrelated in 9 (9 %) and Haploidentical in 5 (5 %) patients. Stem cell source was Marrow, Peripheral stem cells and Cord in 67 (67%), 29 (29%) and 1 (1%) patients respectively. Two patients (2%) received both marrow as well as peripheral stem cells, whereas 2 (1% each) received cord blood and cord plus marrow respectively. Of the 29 PBSCTs done, 4 were from a matched unrelated donor (MUD) and 5 (5%) were from haploidentical donors. The conditioning regimens used consisted of Flu-Bu-Cy-ATG (n=45) [45%], BU-CY-ATG (n=25) [25%], FLU-THIO-TREO-ATG (n=16)[16%], FLU-THIO-TREO (n=8) [8%], FLU-BU-CY-THIO-ATG (n=2) [2%], BU-CY (n=2) [2%] and FLU-BU-CY-RITUXIMAB, FLU-BU-CY-TBI AND each [0.9% each). Majority of the recipients received Cyclosporine and Methotrexate as GVHD prophylaxis (n=88; 88%). The median MNC and CD34 cell dose for patients who had received marrow and/or peripheral stem cells was 7.4×10^8/kg (range 2.1 to 23 $\times10^8$/kg) and 4.5×10^6/kg (range 0.66 to 38 $\times10^6$/kg) respectively. The patient who underwent cord blood transplant received a MNC dose of 0.51X 10^8/kg and a CD34 dose of $0.4X10^6$/kg. Hematological recovery was seen in all patients except two (2) patients that also included the cord blood transplant recipient, who died before engraftment. Neutrophil and platelet engraftment occurred at a median of 14 days (range, 8-24 days) and 21 days (range, 8-72 days), respectively. Thirty seven (37%) patients developed veno-occlusive disease. Thirty three patients (33%) developed Grade I-IV GVHD, 22 (23.3%) had Grade II-IV GVHD and 4 (4%) had Grade III-IV GVHD. Six (6%) patients had chronic GVHD. At day +28, sixty (60%) patients showed more than 90% donor chimersim and 34 (34%) had mixed chimerism. Five (5%) patients had expired before day +28 before chimerism could be done. One patient had primary rejection. Six patients (6%) patients experienced secondary graft rejection. Amongst patients who were more than day 100 at the time of analysis, the Treatment-related mortality (TRM) for the whole cohort was 12%. TRM was 8.3% and 33.34% for Class 2 and class 3 patients respectively. At a median follow up of 25 months, overall survival and thalassemia free survival were 85.3% and 77.3% respectively.
Conclusion: Similar outcomes have been reported from developed countries. Outcome of Class 3 patients still continues to be poor and VOD rates are high in this patient group.

SCT-1_V1.5
HEMATOPOIETIC STEM CELL TRANSPLANTATION IN A PUBLIC HOSPITAL – OUR EXPERIENCE

Mamta Manglani, Ratna Sharma, Niranjan Rathod, Shweta Bansal, Sujata Sharma, Yashwant Gabhale, Rashmi Dalvi, Pooja Balasubramanian, Snehavardhan Pandey, Nikita Shah, Sneha Fernandes, Vishal Jadhav, Omkar Khandkar, Nimish Kulkarni, Pranoti Kamat, Priti Kamble, Prakruthi Kaushik. *Division of Pediatric Hematology-Oncology, LokmanyaTilak Municipal Medical College & General Hospital, Sion, Mumbai, Maharashtra, 400 022, India*
E-mail address: mmanglani@hotmail.com (M. Manglani).

Background: Allogenic Hematopoietic Stem Cell Transplantation (HSCT) has been an established curative option for a number of non-malignant and malignant disorders. Unfortunately, most children in our country are unable to avail of this option due to non-affordability and its non-availability in public sector hospitals. We share our experience of establishing a Hematopoietic Stem Cell Transplant Unit at Lokmanya Tilak Municipal General Hospital, a civic hospital in Mumbai. Till date, over one year, we have performed eight hematopoietic stem cell transplants for various indications.
Objective: To share the experience and challenges in establishing a HSCT unit in a Public Hospital.
Method: The need for a Hematopoietic Stem Cell Transplant (HSCT) centre was always felt with indications for HSCT being identified in increasing number of children. The idea of setting up a HSCT centre, though conceived in 1998, could not materialize till 2012, as there was no source for funding available. After the major hurdle of funds was taken care of by a philanthropic organization, the task of administrative approval, space allocation and getting the desired infrastructure in place began in 2013. Funds were utilized for building the state-of-the-art 20-bedded Pediatric Hematology-Oncology Unit with one bedded HSCT centre. The purchase of equipment and staff recruitment was done simultaneously. Training of the selected staff, including the paramedical personnel and team building was initiated. The process of team building was taken up before the unit became functional and experts with experience in HSCT were invited to join the existing team of doctors in the Pediatric Hematology-Oncology Division. Donor funding was ensured for pre-HSCT workup, process of transplantation and post-transplant care. Patients in whom HSCT was considered curative and who had a matched sibling donor were considered for transplant.
Results: The HSCT unit was operational by August 2015 and 8 patients have been transplanted till date. These include 4 children with Severe Aplastic Anemia (SAA), 3 with Thalassemia Major (TM) and 1 infant with Severe Combined Immune Deficiency- Reticular Dysgenesis (SCID). HSCT with matched sibling donor was done in 7 patients, whereas, father was the donor for the infant with SCID with a 9/10 match. Reduced Intensity Conditioning (RIC) consisting of Flu-Cy-ATG was used in patients with SAA and Treo-Thio-Flu-ATG was administered to the baby with SCID. For 2 of 3 TM belonging to class II by Pesaro classification, myeloablative regimen consisting of Bu-Cy-ATG was used, whereas the third thalassemic, who was Class III, a reduced intensity regimen with Treo-Thio-Flu-ATG was given. Peripheral blood stem cells (PBSC) was the source of stem cells in SAA and SCID, whereas bone marrow harvest was done for TM. Challenges faced included blood group mismatch in 6 of these patients - major ABO mismatch in 3, minor ABO mismatch in 2 of them and 1 with Rh mismatch. Seven of the 8 patients are free of their disease, with no GVHD or any other complications at a follow up ranging from 20 days to 1 year 8 days. The infant with SCID died of adenoviral infection during immediate post-transplant period during the severely neutropenic phase.
Conclusion: It is feasible to set up a HSCT unit in a public sector hospital if one has the vision, passion and commitment. Presently, there are hardly

any similar units in the public sector. And of course, the key to success of any HSCT Centre is good team work. We hope more such units are developed with a similar public private partnership, so that no child in need of HSCT is turned away for want of funds.

SCT-1_V1.6
A SINGLE CENTRE STUDY ON THE VARIABLES AFFECTING OUTCOME OF PICU ADMISSIONS IN CHILDREN UNDERGOING HAEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)

J. Dhaarani [1], V.S. Venkateswaran [1], Ramya Uppuluri [1], S. Divya [1], V. Lakshmanan [1], K. Sathishkumar [2], Chinmoy [2], Ramya [2], Revathi Raj [1]. [1] *Department of Paediatric Haematology, Oncology and Blood and Marrow Transplantation, Apollo Speciality Hospital, Chennai, India;* [2] *Department of Paediatric Intensive Care, Apollo Speciality Hospital, Chennai, India*

Background: Regimen related toxicities form the major causes of transplant related morbidity and mortality and have a major impact on the outcome in children undergoing haematopoietic stem cell transplantation (HSCT). Severe toxicity involving one organ or involvement of multiple organs predicts a poor response. There is limited data from our country on treatment outcomes of children undergoing HSCT requiring intensive care support. In view of the high cost of supportive care, we aimed to analyse the impact of aggressive paediatric intensive care unit (PICU) support in these children.

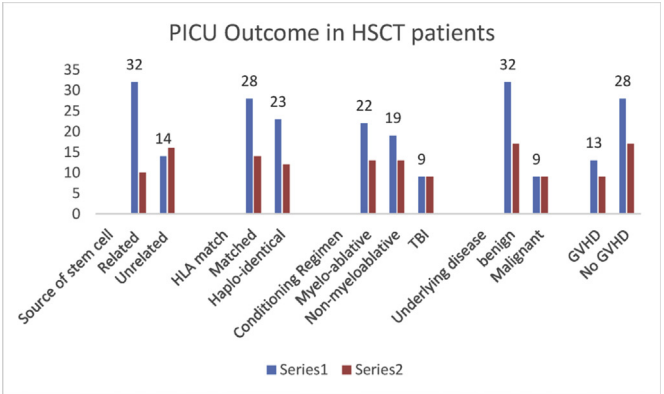
Patients and methods: Data on all the PICU admissions among children <18 years of age who underwent HSCT over 3 years from August 2013 to August 2016 at Apollo Speciality hospital, Chennai was collected by retrospective analysis of the hospital records including case files and discharge or death summaries of patients. The risk factors analysed were

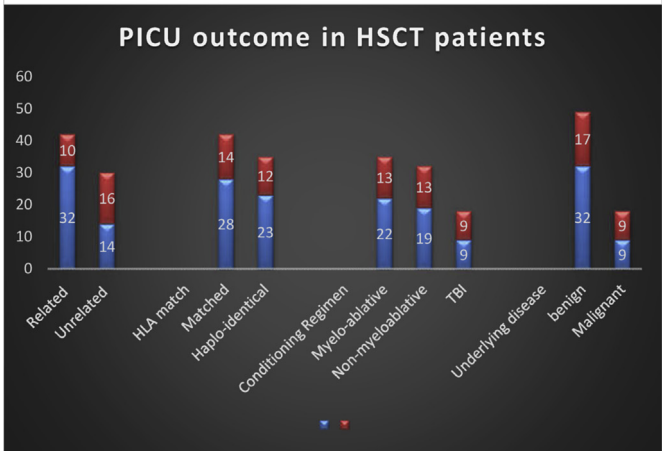
TYPE OF DISEASE	BENIGN VERSUS MALIGNANT
SOURCE OF GRAFT	RELATED VERSUS UNRELATED
GRAFT VERSUS HOST DISEASE - GVHD	PRESENT OR ABSENT
REASON FOR ADMISSION	SEPSIS, CNS, GASTROINTESTINAL, LIVER, RENAL, COAGULOPATHY

Results: Of the total 238 paediatric transplants during the study duration, 72 children (30%) required PICU admission at a mean post infusion day of D+5. About 30% of the children had been transplanted for malignancies and 70% were benign with primary immune deficiency disorders requiring maximum PICU care. Sibling graft was used in 59% and unrelated graft in 41% of children. One-third of children had acute GVHD at the time of admission. The most common indication for PICU care was septic shock with 48% of children. Seizures contributed to 22% and respiratory distress in 23.3%. Of the children who had sepsis, the gastrointestinal tract was the focus in 29.7% and lungs in 43%. The incidence of various organ dysfunctions in our cohort of patients included 73% hepatic involvement, 67% renal dysfunction, 56% gut involvement, 44% with coagulopathy and 43% CNS involvement. When the mortality data was analysed, there was a trend towards higher mortality in the PID group as these children had previously been treated in intensive care units for various infections with multiple antibiotics. The mortality was higher in unrelated at 50% as compared to sibling graft at 27%.The presence of graft versus host disease did not have an effect on outcome. Sepsis with liver or renal dysfunction carried a high mortality.

Conclusions: The overall mortality was 40% with bacterial sepsis with septic shock and multi-organ dysfunction syndrome being the most common cause of early transplant related mortality. The presence of one or more organ dysfunction, especially hepatic or renal, was a predictor of poor outcome. The mortality rates were higher in unrelated or mismatched grafts. However, about 60% of the children could be salvaged with PICU support and all children undergoing HSCT must be cared for in harmony with the PICU team.

VARIABLE	SURVIVAL	DEATH	TOTAL
Source of stem cell			
Related BM/PBSC	32	10	37
Unrelated PBSC	10	12	22
Unrelated cord	4	4	8
HLA match			
Matched	28	14	42
Haplo-identical	23	12	25
Conditioning Regimen			
Myelo-ablative	22	13	35
Non-myeloablative	19	13	32
Use of TBI	9	9	18
Underlying disease			
Non-malignant	32	17	49
Malignant	9	9	18





SCT-1_V1.7
TURNING WEAKNESS TO STRENGTH – LESSONS LEARNT IN DELIVERING CURE FOR PRIMARY IMMUNE DEFICIENCY DISORDERS

Ramya Uppuluri, S. Divya, J. Dhaarani, V.S. Venkateswaran, V. Lakshmanan, Revathi Raj. *Department of Paediatric Haematology, Oncology and Blood and Marrow Transplantation, Apollo Speciality Hospital, Chennai, India*

Aim: Haematopoietic stem cell transplantation (HSCT) is the only form of cure in children with primary immune deficiency disorders (PID). There is very little data to find predictors of morbidity and mortality from our country. We aimed to analyse information could translate into early