Allo- PBSCT for standard and high risk ALL patients using irradiation-free conditioning regimen is associated with lower incidence of transplant related mortality

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Introduction: The outcome of Adult acute lymphoblastic leukemia (ALL) patients with chemotherapy only is not promising. Allogeneic Hematopoietic transplantation (allo-HSCT) in (≥CR1) has shown a superior OS rate. Total body irradiation plus Cyclophosphamide (TBI/Cy) and oral busulfan plus cyclophosphamide (BU/Cy) are commonly used conditioning regimens in ALL.

Material and methods: We retrospectively analyzed the outcome of TBI/Cy and BU/Cy. BU/Cy cohort included 33 patients (9 females & 24 males) with a median age of 28 years (19-42). BU oral dose was 16mg/kg/4 days & Cy dose was 120 mg/kg IV over 4days. TBI/Cy cohort included 45 patients (14 females & 31 males) with a median age of 24 years (19-46). TBI dose was 12 Gy fractionated for 5 days & Cy dose was 120mg/kg IV over 4 days. Both cohorts underwent allo-PBSCT at Nasser Institute Hospital, Cairo. All patients received graft-versus-host disease (GVHD) prophylaxis using cyclosporine-A from day -1 and methotrexate on day + 1 ,+3, +6 and +11.

Conclusions the outcome of BU/Cy is comparable to TBI/Cy as MAC regimen for Allo SCT in adult ALL. With limitation of resources, standard and high risk ALL patients may benefit from allo PBSCT using irradiation-free conditioning regimen associated with lower incidence of sepsis and aGVHD as a cause of transplant related mortality.

Results: In the TBI arm, median time to neutrophil and platelet engraftment was 15 days (9-22) and 15 days (7-47), respectively vs. 14 days (10-22) and 12 days (10-21), respectively in the BU arm. 11/45 TBI patients (24.4 %) developed grade ≥2 acute-GVHD vs. 7/33 (21.2%) patients in the BU arm. Extensive cGVHD was reported in 8/45 (17.7 %) TBI arm vs. 6/33 (18%) patients in the BU arm. Limited cGVHD occurred in 5/45 (11.1%) TBI patients vs. 3/33 (9%) in the BU arm. Cumulative survival was 42.2 % and 15 months OS was 36.7% in the TBI arm vs. 63.6 % and 51.3 % in the BU arm (p= 0.02).The incidence of sepsis and aGVHD as a cause of transplant related mortality (TRM) were significantly higher in the TBI arm vs. BU arm (p<0.001) .

Transplant-related mortality				
Conditioning Regimen		TBI/CY		BU/CY
	Sepsis	11/45	(24.4 %)	1/33 (3 %)
	Relapse	6/45	(13.3 %)	8/33 (24.2 %)
	Acute GVHD	6/45	(13.3 %)	1/33 (3 %)
	VOD	1/45	(2.2 %)	1/33 (3 %)
	Respiratory Failure	1/45	(2.2 %)	1/33 (3 %)