patients (5%) developed severe HC by day +100 after HSCT. There were 22 (4.2%) cases in related donor (RD) recipients, 18 (4.5%) cases in unrelated donor (URD) recipients and 32 (7.4%) cases in URD umbilical cord blood (UCB) recipients. In multivariate analysis, factors associated with an increased risk of severe HC included age >18 yrs (RR 2.4 vs. 1.0 in those <18 yrs [95% CI 1.7 – 3.6, p < .01]), receiving busulfan as part of the conditioning regimen (RR 2.6 vs. 1.0 in those whose conditioning regimen did not include busulfan [95% CI 1.6 – 4.3, p < .01]), receiving an URD or UCB stem cells (RR 1.7, 95% CI 1.2 – 2.3, p < .01 and RR 1.5, 95% CI 1.0 – 2.2, p = .05, respectively when compared to RD bone marrow) and receiving myeloablative conditioning (RR 1.0 vs. 0.6 for nonmyeloablative conditioning (p = .03). With respect to patient diagnosis, Fanconi anemia was associated with a higher risk of severe HC (RR 2.1 vs. 1.0 for SAA/Immune deficiencies/Hematologic disorders, [95% CI 1.0 – 4.3, p.04]) while a diagnosis of storage disorder was associated with a decreased risk of severe HC (RR 0.4 vs. 1.0 for SAA/Immune deficiencies/Hematologic disorders, [95% CI 0.2 – 0.9, p.03]).

The results of our study examining patients transplanted in the last decade show a similar incidence of severe HC as reported in previous studies from our institution. Risk factors (older age, URD or UCB and the use of Busulfan) are also similar except the presence of grades II-IV GVHD is not significantly associated with the development of severe HC in the current analysis. Our current results also indicate that nonmyeloablative transplants are protective with regard to the development of severe HC. Despite regular use of prophylactic measures, severe HC remains a significant problem after HSCT and more effective modalities to prevent and treat it are needed.

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DOES RESPIRATORY MUSCLE DYSFUNCTION PRIOR TO ALLOGENEIC HEMATOPOIETIC CELL TRANSPLANTATION INFLUENCE THE RISK FOR MORTALITY AFTER TRANSPLANT?

Ramirez-Sarmiento, A.[1], Orozco-Levi, M.[1], Walter, E.C.[2,3], Chien, J.W.[2,3]. [1] Hospital del Mar, Barcelona, Spain; [2] University of Washington School of Medicine, Seattle, WA; [3] Fred Hutchinson Cancer Research Center, Seattle, WA.

The prevalence of restrictive lung disease and respiratory muscle weakness (RMW) prior to allogeneic hematopoietic cell transplant (aHCT) and their relationship with HCT outcomes is unknown. We conducted a 12-year retrospective cohort study to determine the prevalence of pulmonary restriction prior to HCT, and assessed whether prior pulmonary restriction, in particular, pulmonary restriction due to RMW, is associated with an increased risk of developing early respiratory failure and mortality.

Methods: All patients >15 yrs old who received an aHCT at our center between 1990 and 2001 and had pulmonary function testing (PFT) prior to transplant were eligible for analysis (n = 2677). A restrictive lung function pattern was defined as a total lung capacity (TLC) <80% of predicted normal. All patients with restriction had their pre-transplant chest x-rays and/or computed tomography scans reviewed by three pulmonologists to determine whether parenchymal abnormalities were absent, unlikely to cause restriction, or highly likely to cause restriction. Multivariate Cox-proportional hazard analysis was performed to assess the association between restriction and two post-transplant outcomes, early respiratory failure and all cause mortality. **Results:** There were 2677 patients with a mean age of 42 ± 12 yrs and mean body mass index of 26 ± 5 k/m^2. 41.8% (n = 1118) were female. Prevalence of pre-transplant pulmonary restriction was high in all malignancy groups (range, 5–40%) regardless of age or nutritional status. High risk pre-transplant disease was significantly associated with restriction (OR = 2.9, p < 0.001). Review of chest imaging of all patients with restriction revealed that 80% (n = 156) had no radiographic abnormalities likely to cause restriction. Comparison of patients with restriction but no radiographic abnormalities, to nonrestricted patients, revealed a significant stepwise increase in risk for mortality with progressively worse pulmonary restriction (TLC range, 24-<70%; hazard ratio range, 1.8–4.1 p < 0.001 all). **Conclusions:** Presence of pre-transplant pulmonary restriction is associated with higher mortality risk after aHCT. The majority of these restrictive cases are unlikely related to lung parenchymal abnormalities suggesting that respiratory muscle weakness may be a previously unrecognized risk factor for respiratory failure and mortality after transplant.

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IMPACT OF BRONCHO-ALVEOLAR LAVAGE ON THE DIAGNOSIS AND MANAGEMENT OF PULMONARY COMPLICATIONS POST TRANSPLANT

Yanik, G.[1,2,3], Maslak, J.[1], Connelly, J.[2], Peres, E.[1,2,3], Mineishi, S.[1,3], Levine, J.[1,2,3], Kaul, D.[3]. [1] University of Michigan Medical Center, Ann Arbor, MI; [2] University of Michigan Medical Center, Ann Arbor, MI; [3] University of Michigan Medical Center, Ann Arbor, MI.

The role of fiberoptic bronchoscopy with broncho-alveolar lavage (BAL) in hematopoeitic stem cell transplantation (HSCT) has been examined in a number of small retrospective studies. The largest review of BAL data to date is now reported. Between 2001–2007, 1507 patients underwent HSCT at the University of Michigan Medical Center. Of the 1507 patients, 300 (19.7%) underwent a BAL procedure, including 9.7% of autologous, and 30.4% of allogeneic transplant recipients. Four hundred forty four BAL were performed, 347 following an allogeneic, and 97 following an autologous HSCT.

Results: Potential pathogens were identified in 117 (26.4%) cases, with infections due to fungi (n = 50), viruses (n = 38), bacteria (n = 38), mycobacterium (n = 10), and PCP (n = 6). In 30 BAL procedures, multiple pathogens were noted. Broncho-alveolar lavage had the lowest yield within the first 30 days post allogeneic HSCT, with 89.9% of BAL procedures negative during this time period. At all time points, the likelihood of identifying a pathogen was < 35%. The BAL led to a change in medical management in 58% of cases, including modifications in antimicrobial therapy in 44% and modifications in corticosteroid therapy in 18%. Procedural complications were rare, and included transient hypoxemia (1.3%), hemorrhage (1.3%) and hypotension (0.2%). Radiographically, the presence of nodular lesions, ground glass opacifications, and air space disease on chest CT were more frequently associated with non-infectious BAL findings (Table). Only the appearance of a tree in bud pattern was more likely to be associated with an infectious etiology, primarily fungal disease. **Conclusion:** Broncho-alveolar lavage is a safe procedure in patients following HSCT transplant, frequently modifying medical management. At all time points, the yield for infectious pathogens is < 35%, with non-infectious etiologies common and associated with multiple radiographic changes by CT.

CT findings and % of BAL with pathogen identified

	nodules (s)	nodules (l)	Tree in Bud	Ground glass	Air space disease
+ BAL	26%	42%	64%	25%	18%
− BAL	74%	58%	36%	75%	82%

nodules (s) < 1 cm; nodules (l) > 1 cm.