

Outcomes of COVID-19 Infection in Hematopoietic Stem-Cell Transplant Recipients: A Single Institution Observational Study

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Objective
Retrospective analysis evaluating outcomes of COVID-19 infection on HSCT recipients at our institution

Background
- Hematopoietic stem-cell transplant (HSCT) recipients are considered high risk for poor outcomes following COVID-19 infection given their comorbidities and immunosuppression - Sharma et al published the CIBMTR observational report data that showed that recipients of allogenic HSCT who contract COVID-19 have poor overall survival with a 30-day mortality of 32% - There have been relatively few studies that look at the effect of COVID-19 on HSCT recipients in the setting of in vivo T cell depletion protocols. - We have had increased use of post transplant cyclophosphamide (PTCy) based GVHD prophylaxis regiments for our HSCT recipients since 2018 - We are interested to see if our COVID-19 outcomes differ from those published

Study Design
Inclusion Criteria: - Males and females 18 years or older who underwent HSCT at Norris Cancer Hospital who were diagnosed with COVID-19 between March 2020 to April 2021. - Demographic data including age, type of hematologic malignancy, conditioning regimen, GVHD prophylaxis, date of COVID-19 infection, with pre- and post-COVID-19 infection labs were obtained. Endpoints - Our primary endpoint in this retrospective analysis was non-relapse mortality within 30 days of COVID-19 diagnosis

Results
21 adult HSCT recipients who had undergone HSCT and subsequently contracted COVID-19 were reviewed. - Demographic and outcome data on tables 1 and 2 6 patients received match related allografts, 7 from match unrelated allografts, and 7 from haploidentical allograft - Patients diagnosed with COVID-19 a median of 469 days post-transplant, 8 patients (38.1%) diagnosed within 1 year. - Of the 20 allo-HSCT recipients, 7 (35.0%) were hospitalized for a median of 7 days (range, 5-17 days) with 2 requiring ICU level of care 1 passed away 20 days after diagnosis, which gives us a 5.0% 30-day case fatality rate attributable to COVID-19 - This patient had tested positive for COVID-19 177 days post-transplant, hospitalized 7 days later, intubated on hospital day 4, and passed away on hospital day 13

Discussion
- Our data suggests that our allo-HSCT recipients who contracted COVID-19 have had generally good short-term outcomes - Study limited by the small number of patients who got infected with COVID-19, particularly 1 year post transplant - PTCy based GVHD prophylaxis may have contributed to improved short-term outcomes, though would be valuable to evaluate in prospective analysis - We are monitoring for any long-term transplant related complications in this population

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Variable	All Patients (n=21)
Primary Diagnosis	
Acute Lymphoblastic Leukemia	7 (33.3%)
Acute Myeloid Leukemia	5 (23.8%)
Myelodysplastic Syndrome	4 (19.0%)
Other (CML, Myelofibrosis, Mantle Cell Lymphoma)	5 (23.8%)
Transplant Type	
Match Related	6 (28.6%)
Match Unrelated	7 (33.3%)
Haploidentical	7 (33.3%)
Auto	1 (4.8%)
Intensity	
Myeloablative	14 (70.0%)
Non-Myeloablative	2 (10.0%)
RIC	4 (20.0%)
N/A (auto)	1
GVHD Prophylaxis	
Tacro/MTX	8 (40.0%)
PTCy	12 (60.0%)
N/A (auto)	1
CMV Reactivation Treatment	
No	20 (95.2%)
Yes	1 (4.8%)
Received Jak Stat inhibitor	
No	18 (85.7%)
Yes	3 (14.3%)
Had COVID Symptoms	
No	5 (23.8%)
Yes	16 (76.2%)
Days post-transplant to COVID	469.0 (500)
Diagnosis	(41 - 2298)
Received steroids after COVID	
Diagnosis	
No	10 (47.6%)
Yes	11 (52.4%)
COVID Duration ¹	37.0 (18.5)
(days)	(15 - 53)
Numbers represent frequency (%) for categorical variables and median (IQR), (min - max) for continuous variables	
¹ Calculated as days from COVID positive date to COVID negative date	

Table 1: Patient characteristics

References
Sharma A, et al. Clinical characteristics and outcomes of COVID-19 in hematopoietic stem-cell transplantation recipients: an observational cohort study. Lancet Haematol. 2021 Mar;8(3):e185-e193. doi: 10.1016/S2352-3026(20)30429-4. Epub 2021 Jan 19. Erratum in: Lancet Haematol. 2021 Jun;8(6):e393. PMID: 33482113; PMCID: PMC7816949.

Variable	All Patients (n=20)
Died	
No	19 (95.0%)
Yes	1 (5.0%)
Hospitalized	
No	13 (65.0%)
Yes	7 (35.0%)
Days Hospitalized (if hospitalized)	7.0 (3.5)
	(5, 17)
Required Supplemental O ₂	
No	13 (65.0%)
Yes	7 (35.0%)
Intubated	
No	19 (95.0%)
Yes	1 (5.0%)

Table 2. COVID Outcomes in allo-HSCT Patients