Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Methods: Adult pts (≥18 y) met 2 criteria for high-risk LBCL: (1) double-/triple-hit lymphoma by FISH per investigator or LBCL with IPI score ≥3 and (2) positive interim PET per Lugano Classification (Deauville score [DS] 4 or 5) after 2 cycles of an anti-CD20– or anthracycline–containing regimen. Pts underwent leukapheresis (≥2 wk after prior systemic therapy), then received conditioning chemotherapy for 3 d and a single axi-cel infusion (2×10^6 CAR T cells/kg). The primary endpoint was complete response (CR) rate (per investigator). Key secondary endpoints were objective response rate (ORR), adverse events (AEs), and CAR T cell levels in blood.

Results: As of 7/15/2020, 31 pts received axi-cel; 15 pts had ≥3 mo of follow-up as of 1/24/2020 (planned IA cutoff date). Median age was 60 y; 40%/60% of pts had DS4/5, 60% had double/triple-hit status, and 67% had IPI score ≥3. Of 12 response-evaluable pts (centrally confirmed high-risk LBCL who received axi-cel), the ORR was 92% (75% CR rate); 75% of pts had ongoing responses at data cutoff. Of 15 pts treated (safety analysis set), the ORR was 93% (80% CR rate); 86% of pts had ongoing responses at data cutoff.

Of 15 safety-evaluable pts, Grade ≥3 AEs occurred in 80% of pts with the most common being white blood cell count decreased (40%), anemia (27%), and encephalopathy (27%). Grade ≥3 cytokine release syndrome and neurologic events occurred in 20% and 27% of pts, respectively. Grade ≥3 infection and neutrophil count decreased were reported in 27% and 20%, respectively. No Grade 5 AEs occurred.

Despite similar assessment schedule and methodology, median peak CAR T cell levels were greater in ZUMA-12 vs ZUMA-1 Cohort 1 (131 cells/μL [range, 10–555] vs 32 cells/μL [range, 1–1514]). Median CAR T cell expansion (AUC_{0-28}) was also greater in ZUMA-12 (1124 cells/μL×d [range, 147–4261]; ZUMA-1: 357 cells/μL×d [range, 5–11,507]). Median time to peak levels of CAR T cells in blood was 7 d after infusion. PK were similar in pts with double-/triple-hit lymphoma and IPI score ≥3.

Updated results will be reported.

Conclusion: ZUMA-12 is the first study evaluating CAR T cell therapy as first-line therapy in high-risk LBCL, which notably was defined by both histology and/or IPI and dynamic risk assessment (PET). Axi-cel demonstrated significant clinical benefit and a manageable safety profile. The study also provides new insights into the pharmacology of CAR T cell therapy for pts exposed to fewer prior therapies.

5

COVID-19 in Hematopoietic Cell Transplant Recipients: A CIBMTR Study

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Introduction: Hematopoietic cell transplant (HCT) recipients are considered vulnerable for poor outcomes after COVID-19, but large-scale studies in HCT recipients are lacking.

Methods: In this analysis, we included 318 HCT recipients who were diagnosed with COVID-19 and were reported to the CIBMTR between March and August 2020. Separate Cox proportional hazard models were created to study the effect of

Table 1
Characteristics of HCT recipients with COVID-19 diagnosis. [n, (%)].

	AlloHCT N=184	AutoHCT N=134
Median age (years, range)	47 (<1-76)	60 (2-78)
Males	107 (58)	81 (60)
Caucasians	141 (77)	74 (55)
Primary Diagnosis		
Acute Leukemias and MDS	143 (78)	2 (1)
CML	6 (3)	0
Lymphoma	18 (10)	41 (31)
Plasma cell disorder/Multiple Myeloma	4 (2)	86 (64)
Solid Tumors	0	4 (3)
Other malignancy	2 (1)	0
Non-Malignant Disorder (SAA, SCD, immune disorder)	11 (6)	1 (1)
Donor		
HLA-identical sibling	66 (36)	
Mismatched related	34 (18)	
HLA-matched unrelated	49 (27)	
Mismatched unrelated	12 (7)	
Cord blood	11 (6)	
Unknown	12 (7)	
Graft type		
Bone marrow	33 (18)	0
Peripheral blood	140 (76)	134
Cord blood	11 (6)	0
Year of HCT		
1999–2010	9 (5)	6 (5)
2011–2014	24 (13)	14 (10)
2015–2017	31 (17)	42 (31)
2018–2020	120 (65)	72 (54)
Median time from HCT to COVID-19 (months, range)	17 (1-243)	23 (1-169)
Severity of infection		
Mild (No supplemental O_2)	86 (47)	69 (51)
Moderate (Supplemental O_2 only)	49 (27)	27 (20)
Severe (Mechanical ventilation)	28 (15)	17 (13)
Not reported	21 (11)	21 (16)
Number of deaths	37 (20)	25 (19)
Primary cause of death		
COVID-19	34 (92)	18 (72)
Primary disease	3 (8)	4 (16)
Organ failure	0	1 (4)
New malignancy	0	2 (8)

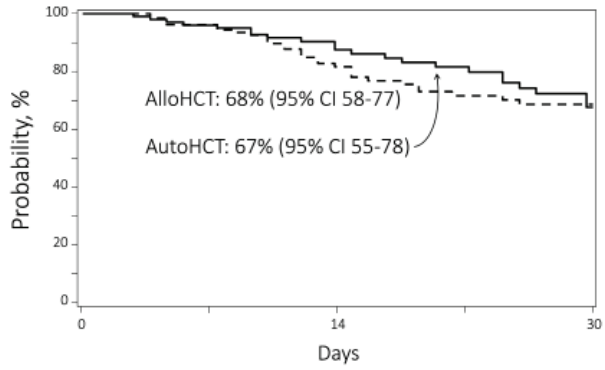

Fig. 1. Survival following COVID-19 diagnosis.

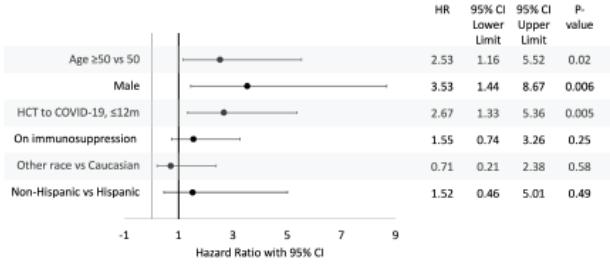

Fig. 2. Multivariate analysis of mortality among alloHCT recipients.

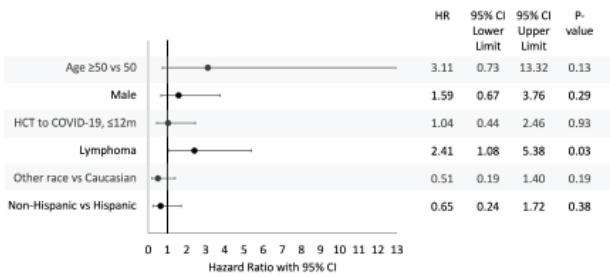

Fig. 3. Multivariate analysis of mortality among autoHCT recipients.

various factors associated with mortality following COVID-19 diagnosis for recipients of allogeneic HCT (alloHCT) and autologous HCT (autoHCT).

Results: Characteristics of the patients included in the study are reported in Table 1. Disease severity was mild in 49%, and severe (requiring mechanical ventilation) in 14% of patients. The overall probability of survival was 68% at 30 days after COVID-19 diagnosis (Fig. 1). Age over 50 years, male gender and development of COVID-19 within 12 months of HCT were associated with a higher risk of mortality among alloHCT recipients (Fig. 2). For the recipients of autoHCT, diagnosis of lymphoma (compared to plasma cell disorders) was associated with higher mortality (Fig. 3). Absolute lymphocyte count $\leq 0.3\times10^9$/L at COVID-19 diagnosis was associated with worse survival (p=0.003).

Conclusions: This report is the largest series to date summarizing the outcomes of HCT recipients with COVID-19. Among recipients of alloHCT with COVID-19, older age, male gender and development of COVID-19 within 12 months of transplant were risk factors for increased mortality.

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High OS, PFS and EFS with Low Rates of Rejection and GVHD after KIR-Favorable abCD3/CD19 Depleted Haploidentical HCT in Children with ALL/AML/MDS: Primary Analysis of the Pediatric Transplantation and Cellular Therapy Consortium ONC1401 Trial

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Pediatric Transplantation and Cellular Therapy Consortium (PTCTC) study ONC1401 (NCT02646839, NCI R01 CA181050) hypothesized 80% PFS at 12 months for children with CR1&2 ALL/CR1&2 AML/MDS undergoing HCT using KIR-favorable haploidentical donors (favorable B content and/or ligand mismatch) that were abCD3/CD19 depleted. The study was open at 11 centers and enrolled 52 patients on the phase II portion of the trial between 4/2016 and 5/2020. Four regimens were allowed including myeloablative (MA, rATG/TBI/thio/cy or rATG/bu/thio/cy) and reduced toxicity (RTC, rATG/mel/thio/flu or TLI/flu/cy/thio/mel) options. Median recipient and donor ages were 11.7 (0.7-21.8) and 35 (6-61) years, respectively. Thirty-one patients had ALL (16CR1/15CR2), 16 had AML (10CR1/6CR2) and 5 had MDS. Median f/u of living patients at this analysis is 810d (168-1772). Enrolled patients were predominantly minorities: 44% Hispanic, 17% Asian, 15% Caucasian, 12% Black, and 12% other. Results: Cumulative incidence (CI) of grade II-III aGVHD at 100d was 12% (95% CI; 3-20%), CI of cGVHD at 2 yrs was 8% (0-16%). Rejection and NRM were low at 6.8% and 9.6%, respectively. At 1 and 2 years, OS was 81% and 76%, PFS was 78 and 73% and EFS was 72% and 67% (Fig. 1). Notably, patients <11 y/o had superior OS (96 vs. 60%; p=0.03) and DFS (91 vs. 58%; p= 0.02; DFS). Donor age and sex did not affect outcomes, but CMV positive status was associated with an increased risk of grades 2-3 aGVHD (p=0.026). Flow MRD status <0.01% prior to HCT was associated with superior OS (83 vs. 33%; p= 0.007), DFS (78 vs. 33%; p=0.001) and EFS (74 vs. 17%; p=0.001) as well as a marked decrease in risk of relapse (p= 0.001; Fig. 2). The use of RTC was associated with improved OS at 2 years (91 vs. 59%; P= 0.033) (Fig. 3), trended better for DFS (87 vs. 59%; p=0.06), but was not different for EFS (75 vs. 59%; p=0.32) compared to MA regimens. Conclusions: This prospective multi-center trial showed that abCD3/CD19 depleted haplo HCT using KIR favorable donors resulted in exceptional