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.

transplant. A univariate analysis (Figure 1) identified as risk factors of lack of response: in all the population, basal levels of IgG<700 mg/dL (71.7% vs 92.9%, p=0.004); in Auto-HSCT, have received rituximab (0% vs 100%, p<0.001); and in Allo-HSCT, have underwent an ex-vivo CD34+ positive selection HSCT (63.2% vs 87.5%, p=0.03). A quantitative analysis showed higher titers of antibodies against spike protein of SARS-CoV-2 in those patients under lenalidomide, without evidence of difference in those patients under immunosuppressant therapy (Figure 2A and 2B). Those patients (n=11) who had antibodies before the vaccination showed increased levels after the vaccine (Figure 2C). The most common AE was local pain (88%), and no patient was admitted because of an AE.

Conclusion: In our cohort of HSTC patients, mRNA-1273 vaccine (Moderna) was effective and safe, so prioritizing this specific population should be recommended.

Low levels of immunoglobulins and, particularly, treatment with rituximab were associated with an inferior humoral response, and it would be advisable to individualize the vaccination in these patients.

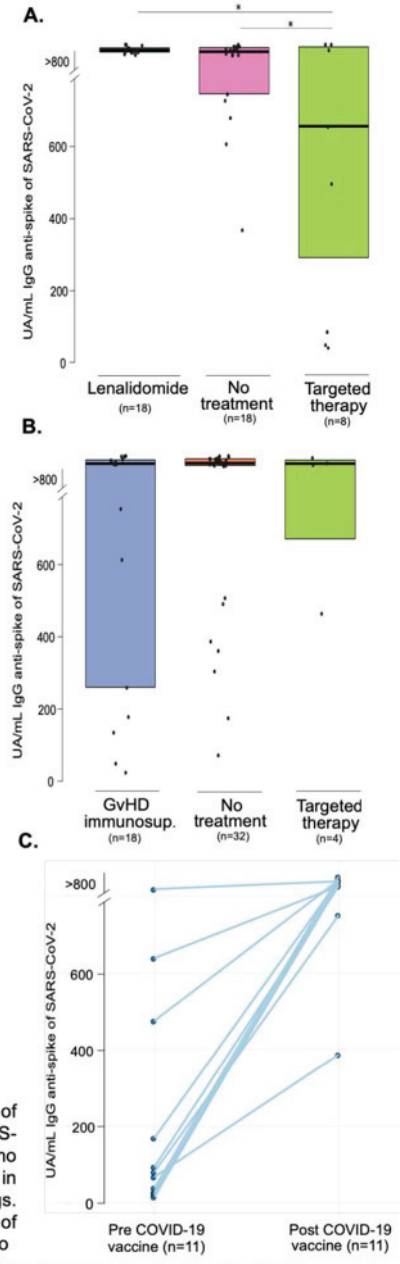

Figure 2.- Titers of antibodies against SARS-CoV-2 in patients who respond to the vaccine in three different settings. Panel A shows titers of antibodies in patients who underwent an Auto-HSCT and were under treatment with other agents at the moment of the vaccine; panel B, shows titers of antibodies in Allo-HSCT patients according to the GVHD immunosuppressive therapy. Boxes and vertical bars denote interquartile range and median area under the curve, respectively. Panel C, represents the titers of antibodies of those patients who had COVID-19 before vaccination and their antibody levels after vaccination.

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Humoral Immunogenicity of Sars-Cov-2 Vaccination in the First Year after Hematopoietic Cell Transplant or Chimeric Antigen Receptor T Cell Therapy: A CIBMTR and BMT CTN Study

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Background: Immunogenicity of SARS-CoV-2 vaccines in recipients of HCT or CAR-T therapy remains ill-defined, particularly within the first year after cell therapy. Impaired antibody responses to the vaccines are likely; further, optimal timing for vaccination and predictors of immunogenicity are poorly understood.

Methods: In an ongoing prospective, multi-center, observational study, patients within 1 year of HCT or CAR-T therapy who underwent SARS-CoV-2 vaccination, provide blood within

14 days pre-vaccine-1, up to 7 days pre-vaccine-2, and 7 – 35 days post-vaccine-2. Patients receiving a single dose vaccine have sample 2 obtained 14 – 35 days post-vaccination and then 4 – 8 weeks later. Total antibody titers against the receptor-binding domain of the SARS-CoV-2 spike protein using a semi-quantitative electrochemiluminescence immunoassay [Roche] were measured. Median antibody titers (MAT) were calculated.

Results: To date, baseline antibody titers are available from 94 enrolled. Of these, 53 patients have antibody results after vaccine-1 and 30 after vaccine-2 (or a second sample after single dose vaccine) to assess vaccine response (Table 1). The population includes 61% (n = 57) allogeneic and 33% (n = 31) autologous HCT, and 6% (n = 6) CAR-T recipients. Median age is 58 years (range, 11 – 77) and 54 (57%) are male. Participants received either Pfizer-BioNTech (BNT162b2; 69%), Moderna (mRNA-1273; 30%), or J&J (JNJ-78436735; 1%) vaccines. Most were vaccinated <6 months from cellular therapy [n = 67, median 107 days (range, 9 – 179)] and the remainder at a median of 232 days (n = 27; 182 – 366). Figure 1 shows baseline antibody titers with a MAT of 4.45 U/mL; 64% had a positive [>0.8 U/L] result pre-vaccination. Only 1 patient had documented COVID-19 at 137 days prior to vaccination; the baseline antibody titer was 413.7 U/mL. The 5 patients vaccinated prior to HCT/CAR-T therapy had baseline titers <0.4, 7, 18.3, 83.8 and >2500 U/mL at a median 100 days (64 – 123) after cellular therapy. Figure 2 shows antibody kinetics. No CAR-T recipients responded. A 4-fold titer increase occurred in 36% of patients after the initial vaccine dose and 57% after vaccine-2; 77% of patients seroconverted after vaccine-2 [MAT 271.5 U/mL (range <0.4 - >2500)]. For patients vaccinated <6 months from cell therapy, the MAT after dose 1 was 14.45 U/mL and 500.5 U/mL after dose 2, whereas those vaccinated 6 – 12 months after cell therapy had MAT of 0.4 U/mL and 215.5 U/mL.

Conclusions: Among 30 individuals receiving SARS-CoV-2 vaccines within a year after cell therapy, 77% seroconverted and 57% had a >4-fold increase in the anti-SARS-CoV-2 spike protein, although absolute titers were low. Responses appear similar in those vaccinated <6 months vs ≥6 months after treatment. Enrollment continues with a target accrual of >500 participants by January 2022. Additional analyses examining T-cell responses are underway.

Table 1: Characteristics of patients with 1 and 2 samples after initial vaccination

Variable		* Baseline to Post #1 [n = 53] <4 - fold increase in titer	* Baseline to Post #1 [n = 53] ≥ 4 - fold increase in titer	Baseline to Post #2 [n = 30] <4 - fold increase in titer	Baseline to Post #2 [n = 30] ≥ 4 - fold increase in titer
Number of patients		34 (64%)	19 (36%)	13 (43%)	17 (57%)
Median Age (range), yrs		59 (14 – 76)	55 (18 – 71)	56 (14-74)	56 (20 – 71)
Age at cell therapy, yrs	10 – 19	1 (50%)	1 (50%)	1 (100%)	0
	20 – 29	3 (60%)	2 (40%)	2 (67%)	1 (33%)
	30 – 39	0	2 (100%)	0	2 (100%)
	40 – 49	7 (70%)	3 (30%)	3 (50%)	3 (50%)
	50 – 59	9 (69%)	4 (31%)	2 (25%)	6 (75%)
	60 – 69	7 (54%)	6 (46%)	2 (33%)	4 (67%)
	≥ 70	7 (88%)	1 (.12%)	3 (75%)	1 (25%)
Gender, Male		20 (67%)	10 (33%)	7 (44%)	9 (56%)
Ethnicity-Race					
	White, Non-Hispanic	24 (63%)	14 (37%)	9 (45%)	11 (55%)
	Black, Non-Hispanic	4 (100%)	0	2 (100%)	0
	White, Hispanic	1 (.100%)	0	0	0
	Asian	1 (25%)	3 (75%)	0	3 (100%)
	Native American	1 (100%)	0	1 (100%)	0
	Unknown/Not reported	3 (60%)	2 (40%)	1 (25%)	3 (75%)
Time from cell therapy to vaccine-1, median (range) days		108 (36 – 290)	120 (64 – 366)	110 (36 – 290)	120 (67 – 366)
Cohort	6 months	27 (71%)	11 (29%)	10 (45%)	12 (55%)
	6 – 12 months	7 (47%)	8 (53%)	3 (37%)	5 (63%)
Type of Cell Therapy					
	Autologous	10 (53%)	9 (47%)	3 (33%)	6 (67%)
	BMAC	9 (56%)	7 (44%)	3 (33%)	6 (67%)
	RIC/NMA	10 (77%)	3 (23%)	4 (44%)	5 (56%)
	Allogeneic, intensity unk	1 (100%)	0	1 (100%)	0
	CAR-T	4 (100%)	0	2 (100%)	0
Disease	Malignant	33 (63%)	19 (37%)	12 (42%)	17 (58%)
	Non-malignant	1 (100%)	0	1 (100%)	0
Disease (malignant)	AML	8 (57%)	6 (43%)	1 (14%)	6 (86%)
	ALL	3 (60%)	2 (40%)	1 (33%)	2 (67%)
	CLL/PLL	2 (67%)	1 (33%)	2 (100%)	0
	MDS/MPD	5 (83%)	1 (17%)	2 (50%)	2 (50%)
	NHL	9 (100%)	0	6 (100%)	0
	HL	2 (50%)	2 (50%)	0	2 (100%)
	Plasma cell	4 (36%)	7 (64%)	0	5 (100%)
COVID-infection	Pre-Vaccine	0	1 (100%)	0	1 (100%)
	Post-Vaccine	1 (50%)	1 (50%)	0	0
Vaccine pre-cell therapy					
	Moderna	0	1 (100%)	0	0
	Pfizer	1 (50%)	1 (50%)	0	0
	J&J	0	0	0	0
Vaccine post-Cell Therapy					
	Moderna	7 (54%)	6 (46%)	4 (50%)	4 (50%)
	Pfizer	27 (69%)	12 (31%)	9 (41%)	13 (59%)
	J&J	0	1 (100%)	0	0
Baseline Antibody levels (U/mL)					
	<0.4 - <0.8	11 (52%)	10 (48%)	5 (38%)	8 (62%)
	0.8 – 20	12 (75%)	4 (25%)	5 (63%)	3 (37%)
	20.1 – 50	7 (88%)	1 (12%)	1 (25%)	3 (75%)
	50.1 – 250	3 (60%)	2 (40%)	1 (50%)	1 (50%)
	>250	1 (33%)	2 (67%)	1 (33%)	2 (67%)
Antibody level	Decline	20 (59)	--	6 (46)	--
	Unchanged	10 (29)	--	5 (38)	--
	Increased but <4 -fold	4 (12)	--	2 (16)	--

*Includes the 30 patients with samples from 3 time-points.

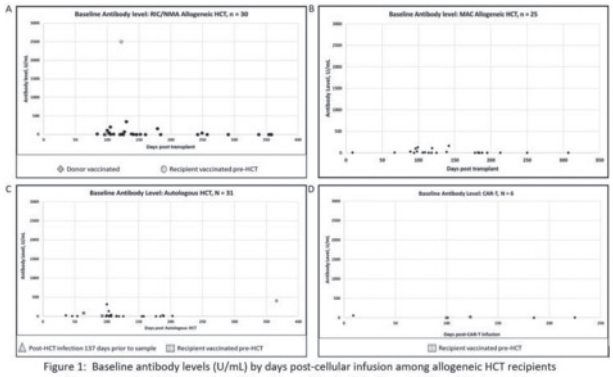

Figure 1: Baseline antibody levels (U/mL) by days post-cellular infusion among allogeneic HCT recipients receiving non-myeloablative or reduced intensity conditioning [A], allogenic HCT recipients receiving myeloablative conditioning [B], autologous HCT recipients [C], and CAR-T cell therapy recipients [D].

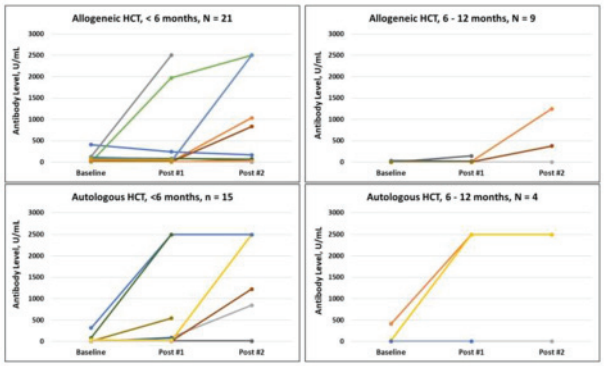

Figure 2: Change in antibody titers from baseline through sample 2, collected 7 – 35 days following vaccine dose #2. The top panels are allogeneic HCT recipients and the bottom panels are autologous HCT recipients based on time of vaccination after cell infusion [<6 months (left), 6 – 12 months (right)]. Each line represents a single patient.

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Humoral Response to COVID-19 Vaccination Given Pre-Cellular Therapy Wanes in Patients after Cellular Therapy: An Argument for Full Reimmunization

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Introduction: Guidelines recommend starting re-immunization with inactivated vaccines for preventable diseases at 6-12 months after hematopoietic cell transplantation (HCT). Patients with hematologic malignancies have been eligible for vaccination against COVID-19 since December 2020. Many of these pts have since proceeded to HCT or chimeric antigen