COVID-19 Vaccination in the First Year after Allogeneic Hematopoietic Cell Transplant: A Prospective, Multi-Center, Observational Study

A CIBMTR® (Center for International Blood and Marrow Transplantation®) and Blood & Marrow Clinical Trials Network (BMT CTN) co-sponsored study

Highlights for Physicians:

This collaborative study uses real-world data to define optimal timing of SARS-CoV-2 (COVID-19) vaccination for allogeneic hematopoietic cell transplantation (alloHCT) recipients. The study aimed to evaluate the safety and immunogenicity of COVID-19 vaccination within 12 months after alloHCT to provide evidence-based guidelines for vaccination in this population.

- **Study results support current guidelines for initiating vaccination three months after HCT, regardless of immunosuppressive medication or concurrent GVHD.** These findings provide encouraging evidence for the potential effectiveness of early mRNA vaccination in alloHCT recipients.
- **Immunosuppression or graft-versus-host disease (GVHD) did not impact achieving the threshold of anti-S IgG titers,** which showed excellent sensitivity and specificity. Most of the alloHCT recipients in this study (57%) achieved this threshold at the final time point.
- **The timing of vaccination may not have significantly impacted recipients' immune responses** due to similar humoral and cellular responses after two or more vaccinations at the timepoints studied.

Results at a Glance:

N=175 alloHCT recipients who received mRNA COVID-19 vaccination within 12 months post-HCT (N=76 less than 4 months, N=99 4 – 12 months) from 22 centers in the U.S. April 22 – November 17, 2021. Blood samples were collected at five specified time points: before first vaccination, after first vaccination, after second and third vaccination, and at the end of the study.

The study's **primary objective** was to compare the immunogenicity of COVID-19 vaccines in alloHCT recipients who started vaccination in less than 4 months or 4 – 12 months after transplantation. The **secondary objectives** included evaluating factors associated with high-level anti-S IgG titers, assessing the correlation between anti-S IgG levels and neutralizing antibodies, and examining the safety of vaccination in this patient population.

- Among alloHCT recipients, 43% were vaccinated in less than 4 months versus 57% 4 – 12 months post-HCT. Recipient demographics were generally similar between groups.
- Median anti-S IgG titers were higher in the less than 4-month cohort at the pre-vaccination and post-first dose time points but similar afterward. Both cohorts showed increased anti-S IgG levels at the post-second and post-third dose time points, with median levels exceeding 2500 U/mL at the post-third dose and end-of-study time points.
- Neutralizing antibody titers were comparable between the less than 4-month and 4 – 12 month cohorts at pre-vaccination, post-second dose, and end-of-study time points. Neutralizing antibody levels increased over time for each strain, with the highest titers observed for Wuhan D614G and the lowest for Omicron B.1.1.529.

Time Point	Cohort	N	Estimate
Post V2	< 4 months	74	43.2%
Post V2	4-12 months	95	28.1%
Post V2	Difference (4-12 v. <4)		-15.1%
Post V3	< 4 months	72	48.6%
Post V3	4-12 months	94	40.4%
Post V3	Difference (4-12 v. <4)		-8.2%
End of study	< 4 months	57	56.1%
End of study	4-12 months	80	57.5%
End of study	Difference (4-12 v. <4)		1.4%

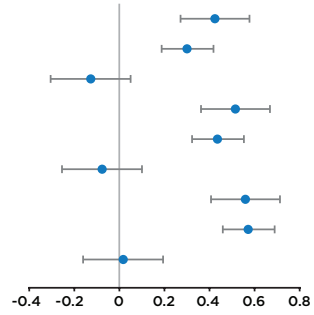

Figure: Proportion of Recipients Who Had a Positive Antibody Response

Advancing Practice and Improving Outcomes:

The National Marrow Donor Program®/Be The Match® and the CIBMTR are committed to patients thriving after transplant. Ensuring optimal infection prevention strategies for patients is of the utmost importance. Our research programs continually evaluate methods that can improve patient outcomes and care.

You can support your patient's journey both pre- and post-transplant by:

- Discussing treatment options and infection prevention strategies with your patients
- Examining your facility's protocol for COVID-19 vaccination
- Coordinating care between transplant centers and hematology/oncology physicians to improve communication and optimize treatment plans for your patients

Read the study results in eClinical Medicine (DOI: 10.1016/j.eclinm.2023.101983).

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