RESEARCH

National Marrow Donor Program® | BE THE MATCH®

Cryopreservation of allogeneic hematopoietic cell grafts did not adversely affect early post-transplant survival during the first six months of the COVID-19 pandemic

WHY?

This study aimed to understand the performance of cryopreserved, or frozen allogeneic (cells from donor) stem cell products in comparison to fresh products.

During the COVID-19 pandemic, concerns regarding travel logistics and donor safety necessitated a substantial increase in the use of cryopreserved hematopoietic stem cell (HSC) grafts from both related (RD) and unrelated donors (URD) to ensure patients had a graft available prior to the start of conditioning for hematopoietic cell transplantation (HCT).

Pre-pandemic data beyond single center or small multi-center reports are lacking to reassure clinicians that cryopreservation of allogeneic grafts does not adversely impact post-HCT outcomes including hematopoietic engraftment and overall survival (OS). **Since the pandemic provided a unifying rationale (including mandatory cryopreservation required by the National Marrow Donor Program (NMDP) and other major registries) for the majority of patients to receive cryopreserved allografts.**

WHAT?

CIBMTR® CENTER FOR INTERNATIONAL BLOOD & MARROW TRANSPLANT RESEARCH

Observational study utilizing the CIBMTR® Research Database

We sought to evaluate early post-HCT clinical outcomes in patients reported to the CIBMTR database who received a first allogeneic HCT using cryopreserved grafts from March through August 2020, compared to patients who received fresh grafts from March through August 2019.

WHO?

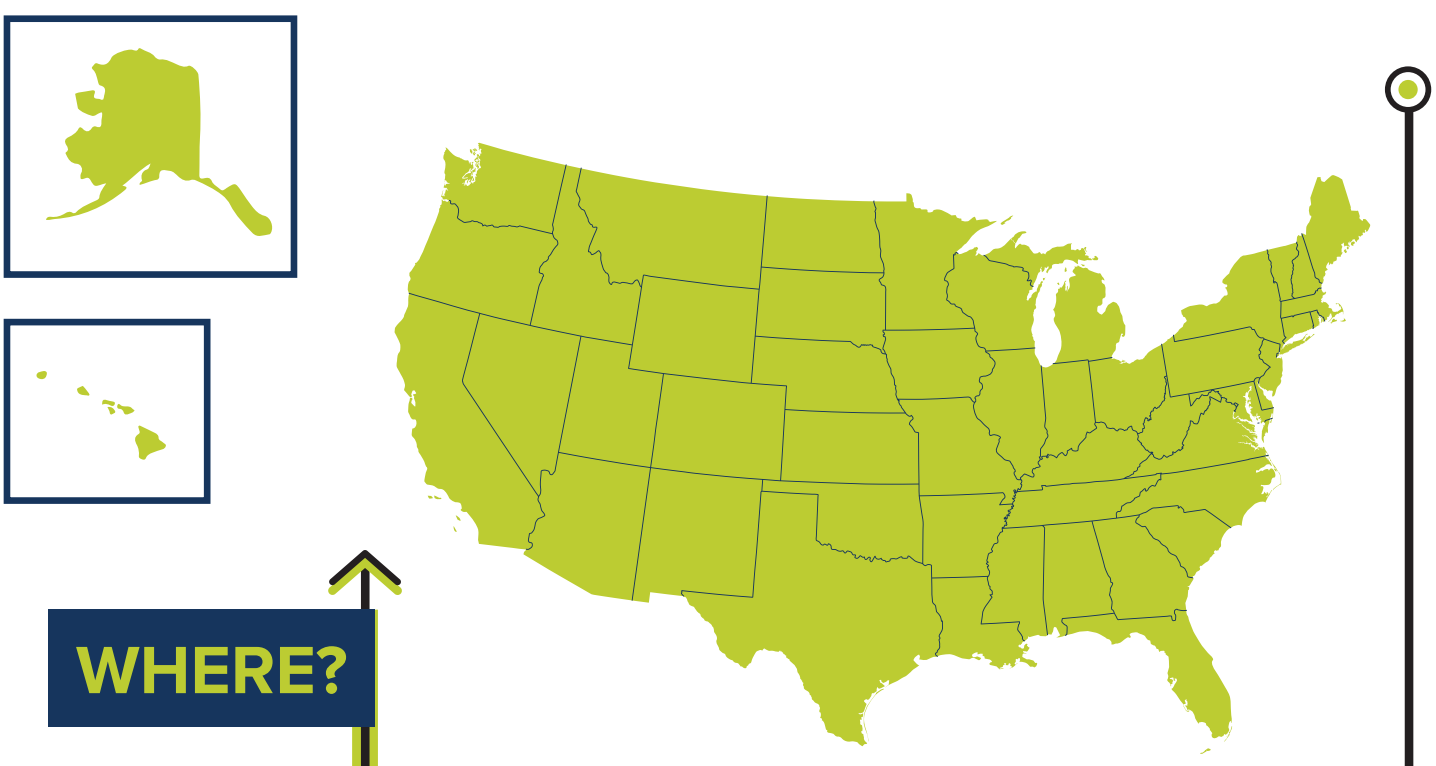
Pediatric and adult patients in the U.S. who received their first bone marrow or peripheral blood stem cell transplant from a related or unrelated adult donor

- 2,499 patients who received fresh bone marrow or peripheral blood stem cell transplants in March to August 2019
- 1,543 patients who received fresh bone marrow or peripheral blood stem cell transplants in March to August 2020

WHEN?

March 2019 – August 2020

WHERE?



United States via CIBMTR Database

IMPACT/FINDINGS:

Data collected during the COVID-19 pandemic showed that cryopreserved hematopoietic stem cell grafts from donors did not negatively impact overall survival after transplant compared to fresh grafts at Day 180 (Hazard Ratio: 1.11, 95% Confidence Interval: 0.94-1.31, p=0.22). The overall survival results were unchanged when limiting the analysis to URD recipients only (multivariate analysis).

The median time to neutrophil and platelet engraftment were both delayed by 1 day in recipients of cryopreserved grafts (16 vs. 15 days and 21 vs. 20 days, respectively), but there was no difference in the risk of primary graft failure by Day 28 (Odds Ratio: 0.93, p=0.71). In multivariate analysis, there was a significantly lower rate of platelet engraftment at Day 100 for cryopreserved grafts compared to fresh grafts (Odds Ratio: 0.70, p=0.003), but there was no significant difference in neutrophil engraftment or in grade 3 or 4 acute graft-versus-host disease (GVHD) between the patients receiving fresh and cryopreserved grafts.

In summary, the shift in clinical practice to cryopreserved grafts necessitated during the pandemic did not adversely impact early post-transplant overall survival or risk of primary graft failure. These results should be interpreted with caution because the current available follow up is short (~6 months). It will be critical to follow these patients and subsequent recipients of cryopreserved grafts for longer periods to determine the ultimate impact of cryopreservation on outcomes. Nevertheless, this large multi-center study will be useful to inform clinical decision making both during and following the pandemic. Additionally, this data may lead to a shift in graft collection practices to allow for more flexibility in meeting the needs of patients.

FROM THE EXPERTS

The study results provide a level of comfort that the shift in clinical practice to cryopreserved products necessitated during the pandemic to ensure patient safety did not adversely impact overall survival early following HCT. It will be critical to follow these and subsequent recipients of cryopreserved grafts for much longer periods to determine the ultimate impact of cryopreservation on outcomes. However, this large multicenter study will be very useful to inform clinical decision making both during and following the pandemic."

Steve Devine, MD
Chief Medical Officer
National Marrow Donor Program

These multicenter data suggest that the planned cryopreservation of allogeneic hematopoietic cell products can be used effectively to ensure that a graft is available at the time of need with limited impact on early post-transplant outcomes. The long-term impacts of cryopreserved products remains to be determined and warrants further study."

Stephen Spellman
Vice President, Research
Senior Scientific Director
National Marrow Donor Program, CIBMTR

CIBMTR's large database allows the field to address important questions affecting clinical practice and patient outcomes in a timely manner. These data from centers throughout the U.S. collected in a standard manner, suggesting that early post-transplant outcomes are not significantly different when using cryopreserved or fresh cells, are reassuring."

Bronwen E Shaw, MD, PhD
Chief Scientific Director CIBMTR Medical College of Wisconsin

#BeTheMatch