

Abstract: P1316

Title: RECENT INFECTION WITH SARS-COV-2 IN DONORS WAS ASSOCIATED WITH A HIGHER INCIDENCE OF ACUTE GRAFT-VERSUS-HOST DISEASE IN RECIPIENTS UNDERGOING ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION.

Abstract Type: Poster Presentation

Topic: Stem cell transplantation - Clinical

Background:

The global coronavirus disease 2019 (COVID-19) pandemic caused by the SARS-CoV-2 drastically impinges upon how allogeneic hematopoietic stem cell transplantation (allo-HSCT) activity proceeds. The low risk of viral transmission in donor stem cell products has been demonstrated as the pandemic advanced and donor criteria loosened. Of note, profound immune dysregulation can be observed in COVID-19 patients. Even mild COVID-19 patients present immune dysregulation. Emerging evidence also confirms SARS-CoV-2 infections strongly shape the immune system even in convalescent individuals, especially during the early recovery stage (ERS). It has been reported that SARS-CoV-2 vaccination following allo-HSCT may induce de novo graft-versus-host disease (GvHD) or worsen preexisting GvHD. However, no reports focus on the association between donor SARS-CoV-2 infection and the development of aGvHD, as well as other transplant outcomes.

Aims:

In this retrospective study, we sought to characterize the impact of donor SARS-CoV-2 infection on transplant outcomes, with a particular focus on its association with aGvHD.

Methods:

We identified 185 allo-HSCT in which donors had mild SARS-CoV-2 infection preceding the donation, including 65 patients (group 1) in active infection phase or ERS (≤ 28 days) and 120 patients (group 2) in late recovery stage (LRS) (> 28 days). Additionally, 194 allo-HSCT (group 0) from donors without previous SARS-CoV-2 infections between September 2022 ("zero COVID-19" period) and December 2022 (the "Omicron wave" outbreak in Beijing) were also enrolled. The primary endpoint was acute GvHD (aGvHD). The secondary endpoint was survival outcomes (i.e., overall survival and disease-free survival). Other endpoints of interest included engraftment, viral complications (i.e., posttransplant COVID-19, cytomegalovirus and Epstein-Barr virus infection), and 100-day transplant-related mortality (TRM).

Results:

Overall, transplants in different donor groups exhibited comparable primary engraftment and survival outcomes. Additionally, the incidences of posttransplant COVID-19 and other viral complications, as well as 100-day TRM, were comparable across groups. However, group 1 had a higher incidence of grade II-IV aGvHD [41.5% (28.3-54.2%)] and grade III-IV aGvHD [22.2% (8.6-39.8%)] compared to group 0 [28.1% (19.6-37.1%), $P=0.014$; 9.6% (2.9-20.7%), $P=0.004$] and group 2 [30.6% (20.4-41.4%), $P=0.067$; 12.2% (7.9-26.6%), $P=0.049$]. Conversely, the risk of aGvHD in group 2 was similar to that of group 0 ($P>0.5$). Matched case-control cohorts again proved that the incidences of grade II-IV aGvHD and grade III-IV aGvHD were significantly higher in group 1 when either group 2 ($P=0.045$ and 0.033 , respectively) or group 0 ($P=0.027$ and 0.019 , respectively) was designated as the control. Moreover, the multivariable model identified the donor in active infection or ERS of SARS-CoV-2 as an independent risk factor for grade II-IV (HR 2.307, $P=0.010$) and grade III-IV (HR 2.962, $P=0.001$) aGvHD while it yielded no significant risk factors associated with survival outcomes.

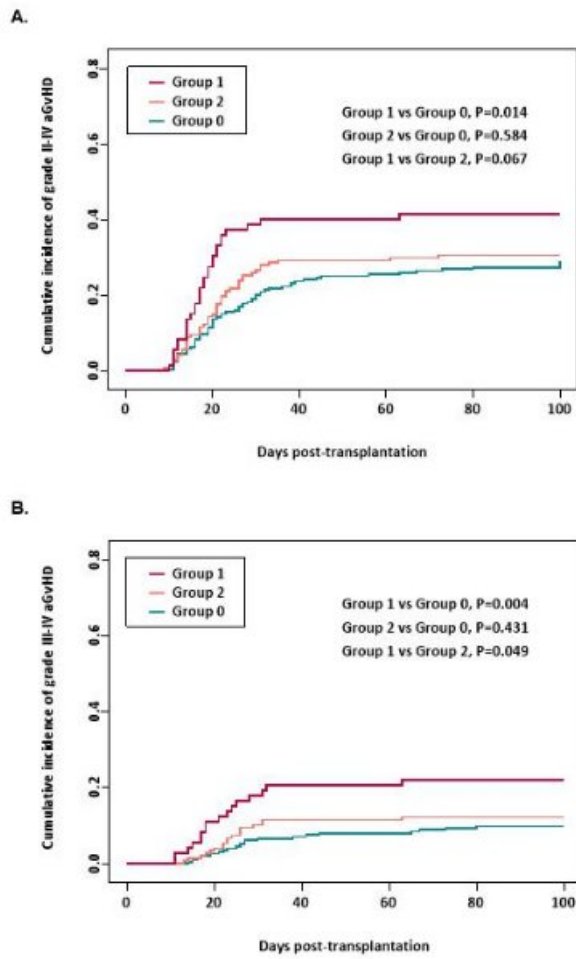
Summary/Conclusion:

We preliminarily demonstrated that transplants from donors in active infection or ERS of mild SARS-CoV-2

infection were associated with higher incidences of aGvHD. While such impact was absent in transplants from convalescent donors in LRS.

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Figure. Cumulative incidences of aGvHD in group 1 (red), group 2 (orange), and group 0 (green). (A) Grade II-IV aGvHD. (B) Grade III-IV aGvHD.



Keywords: COVID-19, Acute graft-versus-host disease, Donor, Hematopoietic cell transplantation