ELSEVIER

Blood 142 (2023) 7021–7022

The 65th ASH Annual Meeting Abstracts

ONLINE PUBLICATION ONLY

722.ALLOGENEIC TRANSPLANTATION: ACUTE AND CHRONIC GVHD, IMMUNE RECONSTITUTION

Study on the Impact of G-CSF Mobilization on the Level of MDSCs in Donor Peripheral Blood and Its Correlation with Patient Prognosis

Man Chen[1], *Rong Wang*[2], *Hui Wang, MD*[3]

[1] Beijing Lu Daopei Hospital, Beijing, CHN
[2] The Affiliated Hospital of Guizhou Medical University, Guiyang, China
[3] Hehei Yanda Lu Daopei Hospital, langfang, China

Introduction:MDSCs are a newly discovered and heterogeneous population of immature bone marrow cells with immunosuppressive characteristics, capable of inhibiting innate and adaptive immune responses. Granulocyte colony-stimulating factor (G-CSF) is a member of the hematopoietic growth factor cytokine family responsible for the proliferation, maturation, differentiation, and survival of neutrophil lineage. In many hospitals in China, allo-HSCT procedures often involve administering G-CSF continuously for 5 days to healthy donors before collecting the graft, to mobilize white blood cells. This study discusses the impact of G-CSF mobilization on the absolute values and functions of total immunosuppressive myeloid-derived suppressor cells (MDSCs) and their subsets, M-MDSCs and P-MDSCs, in the peripheral blood of healthy donors. Furthermore, it explores the effects of transferring MDSCs from the graft to the patient's body on their prognosis and immune reconstitution.
Method:From August 2022 to December 2022, a total of 72 donors and 72 patients who underwent allogeneic hematopoietic stem cell transplantation (allo-HSCT) were selected as the subjects at Lu Daopei Hospital in Beijing. Among the donors, there were 47 males and 25 females, with a median age of 34 years (19, 48). Among the patients, there were 33 males and 39 females, with a median age of 34 years (23, 45). The patients were diagnosed as acute leukemia or MDS in CR status and further categorized into infection group, graft-versus-host disease (GVHD) group, and no-event group based on post-transplantation outcomes. Peripheral blood samples were collected from the donors before and on the 5th day after mobilization, as well as from the graft and the patients. Flow cytometry was employed to determine the absolute counts of MDSCs and their subsets.
Result 1. The absolute count of total MDSCs in the donor's peripheral blood before mobilization was 3/μl (2, 8), accounting for 0.1% (0.0, 0.2) of PBMCs, significantly lower than the absolute count of total MDSCs in the donor's peripheral blood after G-CSF mobilization, which was 2283/μl (1091, 5288), accounting for 6.4% (3.2, 9.5) of PBMCs, $P<0.01$.

In the infection group, the absolute count and percentage of total MDSCs, P-MDSCs, and LOX1+P-MDSCs in the donor's peripheral blood after mobilization were higher than those in the donor's peripheral blood corresponding to the no-event group, and significantly higher than those in the donor's peripheral blood corresponding to the GVHD group. $P<0.05$. Similarly, the absolute count and percentage of total MDSCs, P-MDSCs, and LOX1+P-MDSCs in the correspondingdonor's peripheral blood inthe infection group after mobilization were higher than those in the donor's peripheral blood corresponding to the no-event group, and significantly higher than those in the donor's peripheral blood corresponding to the GVHD group., $P<0.05$. The absolute count and percentage of M-MDSCs in the infection group were higher than the no-event group and GVHD group, but the differences among the three did not reach statistical significance.

Patients who developed infections after transplantation received a higher absolute count of total MDSCs from the graft compared to the no-event group, and significantly higher than the GVHD group, $P<0.05$. The mortality rate in the infection group was 30% (8/26), in the GVHD group was 14% (3/21), and in the no-event group was 0% (0/25). The ROC curve area under the curve (AUC) for the absolute count of total MDSCs per kilogram of body weight from the donor in the GVHD group was 0.669, with a cutoff of 1.7×107/kg, while in the infection group, the AUC was 0.661, with a cutoff of 4.3×107/kg.

Conclusion: G-CSF can induce an increase in the content and enhancement of function of MDSCs in the donor's peripheral blood Maintaining a balance of MDSCs helps ensure immune homeostasis after transplantation.

Disclosures No relevant conflicts of interest to declare.

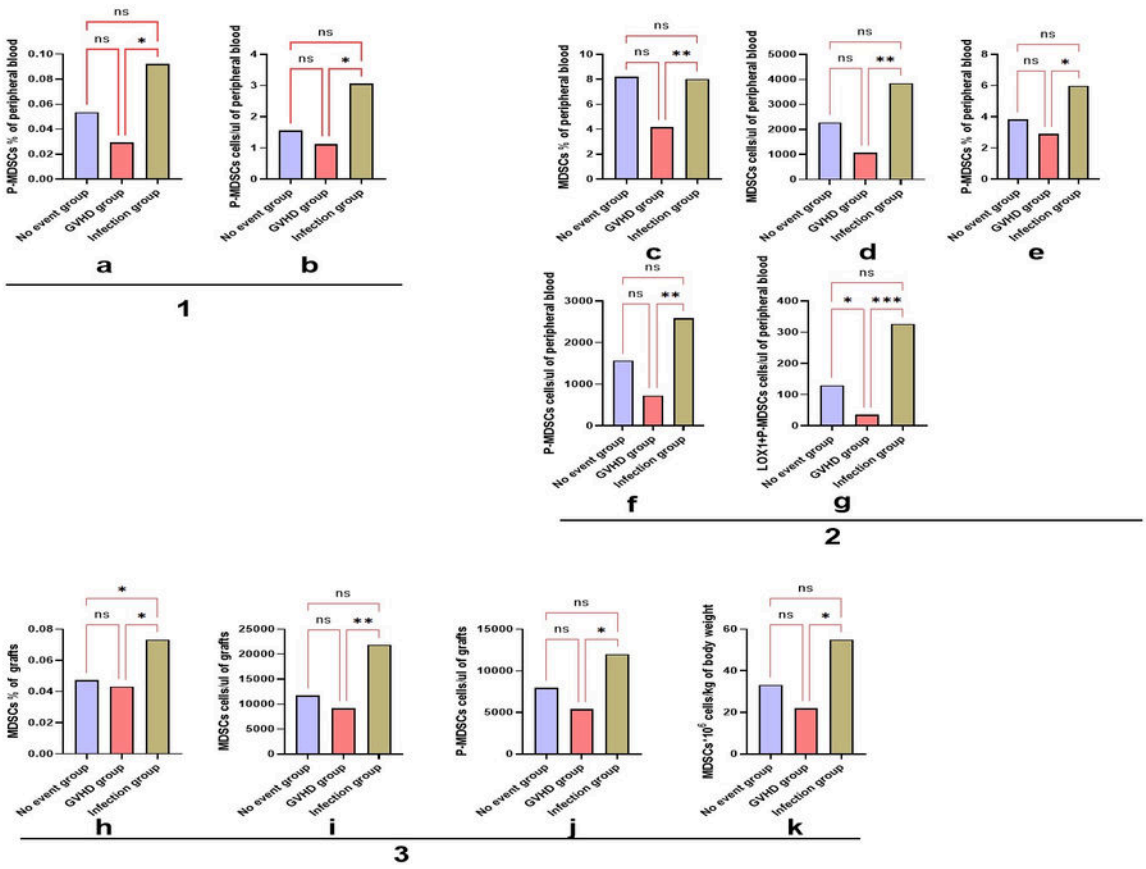

Figure 1. Analysis of differences in MDSCs among patients in the infect group, the no event group, and the GVHD group.[1]Relationship between MDSCs in donor peripheral blood and patient prognosis before G-CSF mobilization

(a-b)Differential Analysis of P-MDSCs%、 P-MDSCs cells/ul in donor peripheral blood and patient prognosis before G-CSF mobilization in the No event, Infected, and GVHD Groups.[2]Relationship between MDSCs in donor peripheral blood and patient prognosis after G-CSF mobilization.(c-g)Differential Analysis of total MDSCs%, total MDSCs cells/ul, P-MDSCs%, P-MDSCs cells/ul, and LOX1+ P-MDSCs cells/ul in donor peripheral blood and patient prognosis after G-CSF mobilization in the No event, Infected, and GVHD Groups.[3] Differential Analysis of MDSCs in Grafts Infused from Patients in the No event, Infection, and GVHD Groups.(h-k)Differential Analysis of total MDSCs%, total MDSCs cells/ul, P-MDSCs cells/ul, and MDSCs cells/kg in Grafts Infused from Patients in the No event, Infected, and GVHD Groups.Kruskal-Wallis analysis.*p<0.05,**p<0.01,***p<0.0001, and p<0.05 were considered statistically significant.

Figure 1

https://doi.org/10.1182/blood-2023-180871