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721.ALLOGENEIC TRANSPLANTATION: CONDITIONING REGIMENS, ENGRAFTMENT AND ACUTE TOXICITIES

Multiple-Factor Analysis of Human Herpes Virus 6 Infection in Complementary Transplantation with Haploidentical Stem Cells and Unrelated Cord Blood

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Background: Hematopoietic stem cell transplantation (HSCT) can ultimately cure various hematological disorders. Building upon the basis of post-transplant cyclophosphamide (PT-cy) haploidentical HSCT, we innovatively employed a combination of haploidentical related donors and unrelated cord blood donors for complementary transplantation to treat pediatric leukemia and severe thalassemia. This approach has been successful, and complementary transplantation has become an important option in haploidentical HSCT. However, with the development of haploidentical HSCT and the long-term use of immunosuppressive agents, viral infections have gained increasing attention, and human herpesvirus 6 (HHV-6) is one of the concerning viruses. HHV-6 exists in two variants, HHV-6A and HHV-6B, with HHV-6B being the common infection in HSCT. HHV-6B is characterized by a preference for lymphocytes and neurons and can easily reactivate in patients with compromised immune systems after HSCT, leading to severe and irreversible brain and nerve damage, and in severe cases, death. In this study, we aim to identify the susceptible factors for HHV-6B infection in cases of complementary transplantation, with the goal of improving the safety of complementary transplantation in HSCT.
Objective: Through a retrospective analysis, we aim to identify the factors associated with HHV-6 infection after complementary transplantation in HSCT, providing clinical evidence for prevention, diagnosis, and treatment.
Methods: We selected cases of HSCT using complementary transplantation from December 2018 to May 2022. Factors such as the primary disease of the patients, gender, age, donor-recipient blood type, haploidentical donor engraftment, different HLA-matched cord blood engraftment, neutrophil and platelet engraftment times, use of ATG and glucocorticoids, fever condition, timing of HHV-6 infection, and the time to seronegativity after treatment were analyzed to identify the characteristics and related risk factors of HHV-6B infection.
Results: Among 142 cases (73 with thalassemia, 19 with AML, 37 with JMML, 2 with Fanconi anemia, 8 with SAA, and 8 with ALL) using complementary transplantation, 91 cases were infected with HHV-6, resulting in an infection rate of 64%. In the infection group, 8 patients were under the age of 2 years (8.8%), while 83 patients were 2 years or older (91.2%). In the uninfected group, 17 patients were under 2 years of age (33.3%), and 34 patients were 2 years or older (66.7%). ($p<0.001$). Regarding the type of graft, 79 patients in the infection group received cord blood transplantation (86.8%), and 12 patients received peripheral blood transplantation (13.2%). In the uninfected group, 19 patients received cord blood transplantation (37.3%), and 32 patients received peripheral blood transplantation (62.7%). ($p<0.05$). Regarding ATG use, 61 patients in the infection group received ATG (67%), and 12 patients did not (33%). In the uninfected group, 25 patients received ATG (49%), and 26 patients did not (51%). ($p=0.035$). In terms of glucocorticoid use, 82 patients in the infection group received glucocorticoids (90.1%), and 9 patients did not (9.9%). In the uninfected group, 13 patients did not receive glucocorticoids (25.5%), and 38 patients did (74.5%). ($p<0.05$). Regarding neutrophil engraftment time, it was 36 days in the infection group and 23 days in the uninfected group. Regarding platelet engraftment time, it was 43.5 days in the infection group and 18.5 days in the uninfected group. In terms of CMV and EB virus infection, only one patient in the infection group had concurrent CMV infection, and there were no cases of concurrent EB virus infection.
Conclusion: In complementary transplantation, cord blood transplantation, glucocorticoid use, ATG use, and recipient age are high-risk factors for HHV-6 infection/reactivation. There were no significant differences in HHV-6 infection between different diseases treated with complementary transplantation. Furthermore, HHV-6 infection significantly delays the engraftment of neutrophils and platelets.
Keywords: Hematopoietic stem cell transplantation, haploidentical, cord blood, human herpesvirus 6 (HHV-6)

Disclosures No relevant conflicts of interest to declare.

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