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Administration of hydrogen-rich saline in mice with allogeneic hematopoietic stem-cell transplantation

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Abstract

Background: Hydrogen, as a novel antioxidant, has been shown to selectively reduce the level of hydroxyl radicals and alleviate acute oxidative stress in many animal experiments. Hydrogen-rich saline provides a high concentration of hydrogen that can be easily and safely applied. Allogeneic hematopoietic stem-cell transplantation (HSCT) has been the most curative therapy for hematological malignancies. However, acute graft-versus-host disease (aGVHD) is the main cause of death in post-transplantation patients. In this study, we examined whether hydrogen-rich saline would show favorable effects on acute GVHD in mice.

Material and methods: After lethal irradiation, BALB/c mice received bone marrow transplantation from C57BL/6 mice. Hydrogen-rich saline (5 ml/kg) was given to recipient mice in the hydrogen group once a day by intraperitoneal injection, and saline (5 ml/kg) was given to recipient mice in the saline group. Survival rates were monitored, clinical and pathological scores of aGVHD were determined after bone marrow transplantation (BMT), and the serum cytokine levels were examined on the 7th day after BMT.

Results: This study proves that hydrogen-rich saline increased the survival rate, reduced clinical and histopathological scores of aGVHD, promoted the recovery of white blood cells, reduced the serum cytokine levels, and reversed tissue damage after transplantation in mice.

Conclusions: Hydrogen has potential as an effective and safe therapeutic agent in aGVHD.

Figures

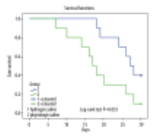

Figure 1 Survival curves by Kaplan-Meier analysis...

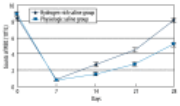

Figure 2 The change of leukocyte counts...

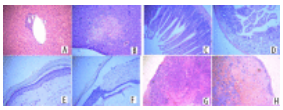

Figure 3 Histopathological changes of the liver,...

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