Does bone marrow-derived mesenchymal stem cell transfusion prevent antisperm antibody production after traumatic testis rupture?

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Abstract

OBJECTIVE:

To determine whether transfusion of mesenchymal stem cells (MSCs) could prevent humoral immune response and autoimmunization against sperms after traumatic testis rupture.

METHODS:

Immunomodulatory properties of MSCs have been evaluated by a prospective cohort on 50 adult BALB/c mice. In each interventional arms of study, controlled testis rupture and surgical repair were exerted. In addition to tissue repair, single dose of 5×10⁵ MSCs labeled by green fluorescent protein was delivered intravenously to 20 cases (cell therapy group). After euthanizing, seroconversion of antisperm antibody (ASA) was compared between 2 interventional groups as response of humoral immune system. Lung and testis tissues were examined for green fluorescent protein-positive cells to assess whether presence of stem cells is correlated with seroconversion rates.

RESULTS:

Six cases had been lost during the study. Fourteen of 16 mice in cell therapy control group formed ASA (87.5%) but 6 of 18 mice (33.3%) in cell therapy group were immunized and formed ASA (P=.002). Transplanted cells were traced in lungs of 55% (n=10) of cell therapy group and none were found in trauma site. Small volume of mice blood was our main limitation to trace seroconversion or quantitative measurement of ASA in each case.

CONCLUSION:

In this in vivo model of autoimmune infertility, bone marrow-derived MSC transfusion showed immunosuppressive effects on antibody production. Considering immunomodulatory properties of MSCs even in allogeneic settings, novel clinical application should be investigated further.

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