

Stem Cell Transplantation Increases Antioxidant Effects in Diabetic Mice

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Abstract :

Intra bone marrow-bone marrow transplantation (IBM- BMT) + thymus transplantation (TT) has been shown to reduce the incidence of graft versus host disease (GVHD) and restore donor-derived T cell function. In addition, an increase in insulin sensitivity occurred in db/db mice after IBM-BMT+TT treatment. Heme oxygenase (HO)-1 is a stress inducible enzyme which exert antioxidant, antiapoptotic, and immune-modulating properties. We examined whether IBM-BMT+TT could modulate the expression of HO-1 in the kidneys of db/db mice. Six-week-old db/db mice with blood glucose levels higher than 250 mg/dl were treated with IBM-BMT+TT. Six weeks later, the db/db mice showed decreased body weight, blood glucose levels and insulin, and increased plasma adiponectin levels. The upregulation of HO-1 was associated with significantly ($p < 0.05$) increased levels of peNOS and pAKT, but decreased levels of iNOS in the kidneys of db/db mice. Plasma creatinine levels also decreased ($p < 0.05$), and the expression of type IV collagen was improved. Thus IBM-BMT+TT unregulated the expression of HO-1, peNOS and pAKT, while decreasing iNOS levels in the kidney of db/db mice. This was associated with an improvement in renal function.

Key Word :

IBM-BMT+TT, antioxidant, HO-1, diabetic nephropathy.

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