Bone marrow mesenchymal stem cells modulate autogeneic and allogeneic regulatory T cells proliferation derived from patients with systemic lupus erythematosus

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Mesenchymal stem cells (MSCs) have recently been shown to suppress the activity of T cell proliferation *in vitro* and *in vivo*. Subsequently, MSCs were shown also to exert similar effects on B cells, dendritic cells and natural killer cells. These results suggested that MSCs could be used to dampen immune-mediated diseases and transplant rejection. Cotransplantation of MSCs and hematopoietic stem cells (HSCs) maybe a new strategies for treatment autoimmune disease such as systemic lupus erythematosus(SLE). However, some research results suggested that HSCs or MSCs may be dysfunction in patients of SLE. Therefore, we focused in this study to understand whether MSCs separated from SLE or healthy subjects can immudulate regulatory T lymphocytes (Treg) proliferation. MSCs separated with percoll (1.073 g/ml) from bone marrow. The subset regulatory T cells in the peripheral blood of patients with SLE were isolated with MACS CD4 and CD25 microbeads. The purity of MSCs was identified with the phenotypes by fluorescence activated cell sorter(FACS). Lymphocytes or Treg cells isolated from peripheral blood of SLE were cocultured with autologous MSCs or MSCs from healty donors. The level of IL-10 and TGF- β were determined by enzyme link immune adsorb assay. The results shows that the lymphocyte activity in SLE was suppressed by autogeneic and allogeneic MSCs respectively. And the inhibition rate was 56.32% and 65.46% , respectively. A stronger immunosuppressive effect of allogeneic MSCs was detected. In addition, MSCs are capable of increasing the proportion of allogeneic and autologous regulatory T cells in a dose dependent fashion in MLCs. MSCs stimulate Treg cells produce IL-10 and TGF- β . Therefore, in immune-mediated diseases, the protective effects might function in concert with the immunosuppressive and anti-inflammatory activitie. MSCs might play important roles in immunopressant lymphocytes proliferation and be important to cotransplant with autogeneic hematopoietic stem cells transplantation to treatment autoimmune disease.

Keywords: systemic lupus erythematosus, mesenchymal stem cells, coculture, T-lymphocytes, regulatory

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