

Abstract:

Researchers' emphasis has recently turned to the use of stem cells in the treatment of autoimmune diseases and malignancies. In this research, we have focused on increasing the efficiency of Mesenchymal stem cells (MSCs) in the treatment of Rheumatoid Arthritis. We confirmed the increase of the MSC's effects on the host's immune system by stimulating the NOD2 receptor in these cells with Muramyl dipeptide (MDP). MSCs were extracted and cultured from the bone marrow of mice and intraperitoneally injected into the experimental model of Rheumatoid Arthritis in Wistar rats. MSCs reached our desired purity and efficiency in the second passage of the culture. We confirmed the presence of specific CD markers on the surface of cells by Flow cytometry. Induction of this autoimmune disease was done by injecting Freund's complete adjuvant. MSCs were treated with MDP and washed 24 hours before use. The injection of cells was done six days after the disease induction and by observing the complete swelling of the joints. By monitoring the process of disease recovery and comparing changes in factors such as IL-1-beta, TNF-alpha, CRP, MPO, NO, IDO, IL-10, TGF-beta and changes in the expression of Foxp3, GATA3, ROR-c and Tbet genes, in addition to the change in weight and symptoms between the untreated and treated groups, we found a significant difference in increasing the efficiency of this cell therapy method.

Keywords:

Mesenchymal Stem Cells, Rheumatoid Arthritis, Cell therapy, Experimental Model, Immunomodulation