PSORIASIS

A PRECLINICAL STUDY OF HUMAN AMNION-DERIVED MESENCHYMAL STEM CELLS IN MOUSE MODEL OF PSORIASIS

Hideki Hayashi [1] - Yasutomo Imai [1] - Kenichi Yamahara [2] - Akiko Hamada [2] - Yoshihiro Fujimori [2] - Kiyofumi Yamanishi [1]

Hyogo College Of Medicine, Department Of Dermatology, Nishinomiya, Japan [1] - Institute For Advanced Medical Sciences, Hyogo College Of Medicine, Laboratory Of Medical Innovation, Nishinomiya, Japan [2]

Background: Cell-based therapies using mesenchymal stem cells (MSCs) are emerging as a treatment strategy for intractable inflammatory disorders. However, clinical applications of MSCs have been reported in only a few patients with psoriasis. The amniotic membrane is rich in MSCs and human amnion-derived MSCs (hAMSCs) are more advantageous than other MSCs for clinical applications, because amniotic membranes are readily available using non-invasive procedures.

Objective: The immunomodulatory activity of hAMSCs has been demonstrated using a rat colitis model. In the present study, the therapeutic effect of hAMSCs was assessed using a mouse model of psoriasis.

Materials and Methods: The ear skin of B6 mice was treated with topical imiquimod (IMQ) daily for 5 days, and hAMSCs were administered intravenously at days 0 and 3. Gene expression in the skin was examined using quantitative real-time PCR. Cytokine production from γδ-low T cells was examined by flow cytometry.

Results: Ear swelling was significantly milder in the hAMSC-treated mice than in mice treated with control serum. Histology showed epidermal acanthosis and neutrophil infiltration into the epidermis in the IMQ-treated skin, whereas these changes were attenuated in mice treated with hAMSCs. Expression of the IL-17A, IL-22 or CXCL1 genes induced by IMQ treatment was significantly reduced in hAMSC-treated mouse skin. IL-17A and IL-22 production from γδ-low T cells was also significantly reduced in the IMQ-treated skin by administration of hAMSCs.

Conclusion: In this study, we provide evidence that hAMSCs suppress the development of psoriasis in a mouse model. This suggests that hAMSCs might be beneficial for the treatment of psoriasis. Clinical trials for psoriasis treatment will help to elucidate the efficacy of cell-based therapy using hAMSCs.