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Amniotic fluid derived stem cells promote skin regeneration and alleviate scar formation through exosomal miRNA-146a-5p via targeting CXCR4

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Abstract

Background and Objectives

Regenerative medicine is promising in wound healing. Exosomes derived from human amniotic fluid derived stem cells (hAFS) have become an important area of research for many diseases as a key paracrine factor, but its effects in wound healing remains unknown. In this study, we investigated the possible role and possible mechanisms of hAFS in skin wound healing.

Methods

hAFS were isolated from human amniotic fluid via routine amniocentesis. The mice were randomly divided into 2 groups: control group and hAFS group treated with 1.25×10^6 hAFS cells. Immunohistochemistry staining was performed for histological analysis and qRT-PCR for the assessment of gene levels. Luciferase Reporter Assay was performed for the verification of target gene.

Results

Our results demonstrated that hAFS accelerated wound closure. hAFS alleviated scar formation via promoting ECM remodeling, upregulating molecular of immune response, enhancing antifibrotic activity, and decreasing the secretion of inflammation-associated cytokines through exosomal miRNA-146a-5p via targeting CXCR4.

Conclusions

Taken together, hAFS was a promising cell source for wound healing. The findings in this study provide vital references and pave the way for future research.

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