

MESENCHYMAL STEM CELL-DERIVED EXOSOMES FOR THE TREATMENT OF SKIN AND SUBCUTANEOUS TISSUE DISEASES: CURRENT EVIDENCE FROM CLINICAL TRIALS

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Background: Skin and subcutaneous tissue diseases (SSTDs) affect over one-third of the population and cause significant disability. Current therapies often have limited efficacy, side effects, and high cost [1]. Mesenchymal stem cell-derived exosomes (MSC-Exo) show promise due to their cargo delivery capacity, modifiability, and stability during storage and transport [2,3]. This study aimed to identify clinical trials on MSC-Exo for SSTDs using the ClinicalTrials.gov database.

Materials and methods: The ClinicalTrials.gov database was searched on January 8, 2025, using the keywords “skin”, “exosome”, and “exosomes” to identify clinical trials investigating MSC-Exo for the treatment of SSTDs.

Results: Fifteen clinical trials were registered, investigating the safety and/or therapeutic efficacy of MSC-Exo in various SSTDs, including alopecia, psoriasis, melasma, dystrophic epidermolysis bullosa, skin aging, wounds, chronic ulcer wounds, skin ulcers, burn wounds, and hair thinning. The first clinical trial was registered in 2019, and from 2022 the number of trials increased significantly (2019 – 1; 2020 – 0; 2021 – 0; 2022 – 5; 2023 – 3; 2024 – 6). Trials were conducted in Iran, Turkey, Pakistan, the United States, China, Singapore, Indonesia, and Spain, with the highest numbers in the United States (4) and China (4). Most trials focused on alopecia (5). By status, six trials were completed, five were recruiting, three were not re-

cruting, and one had an unknown status. The findings are detailed in Dairov et al., *Curr Stem Cell Res Ther* (2025).

Conclusion: The analysis of ClinicalTrials.gov data identified 15 clinical trials on MSC-Exo for the treatment of SSTDs. Most clinical trials have focused on alopecia and were conducted in the United States and China, reflecting growing global interest in MSC-Exo as a therapeutic option.

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Keywords: mesenchymal stem cell, mesenchymal stem cell-derived exosome, skin disease, skin and subcutaneous tissue disease, clinical trial.

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