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The role of adipose-derived mesenchymal stem cells in the healing of experimentally induced gastric ulcer in adult male albino rats

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Background: Gastric ulcer is one of the most irritating health problems. The commonly used drugs for peptic ulcers have the danger of drug interaction, adverse effect and increased incidence of relapses during ulcer therapy. Adipose tissue-derived stem cells (ADSCs) are considered to be ideal for application in regenerative therapies.

Objective: Study the role and mechanism of action of adipose-derived-mesenchymal stem cells in accelerating healing of indomethacin-induced gastric ulcer in rats.

Methods: The ulcer was induced by 200mg/kg indomethacin, and then after 5 hours, adipose-derived mesenchymal stem cells (from lipectomy operation) are processed and injected intraperitoneally in rats with an ulcer. Flow cytometric analysis has been done on isolated cells. Hematoxylin & Eosin stain has been done to detect signs of healing at 1,2,3,4 days. Also, the expression of VEGF & PCNA immunohistochemical reactions has been carried out to confirm the results.

Results: The results show that healing is accelerated in rats injected with stem cells at 2, 3, 4 days compared to +ve control (auto healing) model; also an expression of VEGF and PCNA is increased in stem cells injected specimens. Detection of human leukocytic antigen (HLA) after 4 days of injection confirmed migration of stem cells to the site of the ulcer.

Conclusion: Adipose-derived-mesenchymal stem cells has a role in accelerating healing of gastric ulcer in rats through stimulating angiogenesis at ulcer base and proliferation of cells at ulcer margin.

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