

The Effect of Topical Simvastatin Gel on Epithelialization Process, Collagen Synthesis, Fibroblast Proliferation, and Neovascularization of Full-Thickness Wound on Wistar-Strain rat (*Rattus norvegicus*)

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ABSTRACT

Background : Wounds and wound healing have always been one of the most important subjects that experimental researches were dedicated to. Simvastatin has been used for long as a common lipid lowering agent which was reported to have some pleiotropic effects such as antioxidation, anti-inflammation and immunomodulation. In this study we aimed to determine the effect of simvastatin on wound healing process in laboratory rats by means of stereological and histopathological analyses.

Material and method : 27 male *Rattus norvegicus* rats each with a 2 cm² full thickness wound on their backs were divided into three groups, first group that received 2% concentration of simvastatin, second group that received 3% concentration of simvastatin and third group treated with only gel base. Duration of the study was 5 days. Wound closure rate, epithelialization, fibroblast proliferation, collagen bundles synthesis and vascularization were determined.

Result : At the end of study, there are differences in the number of the wound closure rate, epithelialization, fibroblast proliferation, collagen bundles synthesis and vascularization. Experimental group that treated with simvastatin 3% improves the wound healing in rats skin better than the group that treated with simvastatin 2% and gel base revealing statistically significant differences ($p < 0,05$)

Conclusion : Topical application of simvastatin gel enhances wound healing, however further researches are still needed to find the exact mechanism, advantages and disadvantages so that it can be applicable in human.

Keywords: Simvastatin, Wound healing, Epithelialization, Fibroblast proliferation, Collagen bundles, neovascularization.

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