Effect of Topical Application of Estrogen Hormone on Wounds Healing in Ovariectomized Rabbits

(Histological and Immunohistochemical study)

A thesis

Submitted to the Council of the College of Dentistry at the University of Baghdad, in Partial Fulfillment of the Requirement for the Degree of Master of Science in Oral Histology and Biology

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2014 A.D. 1435 A.H.

Abstract

Background: Wound healing as a normal biological process in the human body, is achieved through four precisely and highly programmed phases: hemostasis, inflammation, proliferation and remodeling. Growth factors released in the traumatized area promote cell migration into the wound area (chemotaxis),stimulate the growth of epithelial cells and fibroblasts (mitogenesis), initiate the formulation of new blood vessels (angiogenesis) and stimulate matrix formation and remodeling of the affected region.

Factors that affects wound healing are sex hormones and one of these hormones is estrogen. A wide range of cutaneous cell types (eg, fibroblast, endothelial, epithelial and inflammatory) express estrogen receptors, indicating potential estrogen responsiveness.

Aims of the study: Evaluation of the effect of topical application of estrogen hormone on the healing of incisional cutaneous wounds histologically and immunohistochemically .

Materials and methods: Thirty two female New Zealand rabbits were used in this study .The animals were divided into four groups ,eight animals for each healing interval(3,7,10 and 14days). All animals were ovariectomized,then after tow weeks, surgical incisional wounds were done on the right and left sides of face for each animal, the left (control) side was left to heal normally and estrogen hormone was applied on skin wound of right (experimental) side.

Histological evaluation and immunohistochemical localization of insulin growth factor-1receptor (IGF-1R) was perfomed on all studied samples of control and experimental groups.

Results: The histological findings showed higher mean values of all estimated inflammatory cells in experimental group at 3 and 7 days than in control group,while for 10 and 14 days healing periods high mean values for control

groups were recorded.There was high significant difference ($p<0.01$) between experiment and control group regarding thickness of epithelium except at 7 days there was no significant difference ($P>0.05$).

Immunohistochemical findings revealed higher level of stromal and epidermal expression for insulin growth factor-1receptor (IGF-1R) for experimental group at 3 and 7 days than control group and high mean values of expression were detected at 10 and 14days for control group.

Conclusion: The present study concludes that topical application of estrogen hormone accelerates healing of cutaneous wounds .