

**Republic of Iraq  
Ministry of Higher Education  
And Scientific Research  
University of Baghdad  
College of Dentistry**



**Evaluation of the Role of Local Application of  
*Trigonella Foenum Graecum*(Fenugreek) Oil in  
Cutaneous Wound Healing in Rats by  
Histological and Immunohistochemical  
Analysis(Interleukin-6)**

A Thesis

Submitted to the Council of the College of Dentistry at the  
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Requirements for the Degree of Master in Oral Histology

By

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# Abstract

**Background:** Healing is a process that restores the physical integrity of body structures. It is a dynamic, complex, multicellular process that involves the extracellular matrix, cytokines, blood cells, and growth factors. It includes hemostasis, inflammatory phase, proliferative phase, and maturation phase. Studies have shown fenugreek to be an anti-inflammatory agent, which supports its traditional use as a treatment for sore throat, arthritis, and wound healing.

Biomarkers (biological markers) are generally biomolecules whose qualitative and quantitative presence provide an indication of the state of a biological system.

It has been postulated that inflammatory response occurring after cutaneous wounding is a prerequisite for healing and that inflammatory cytokines, such as interleukin-6 (IL-6) are involved in this process. IL-6 has crucial roles in wound healing, probably by regulating leukocyte infiltration, angiogenesis, and collagen accumulation, it is detectable within 12 hours of experimental wounding and may persist at high concentrations for longer than 1 week.

**Aims of the study:** The present study was designed to assess skin wound healing process after local application of fenugreek seed oil by histological analysis and immunohistochemical evaluation of IL-6 expression throughout healing intervals.

**Materials and methods:** Thirty male albino rats (*Rattus norvegicus albinus*) weighing about 250-400gm, were used in this study. The surgical procedure consisted of two circular standardized wounds performed on rat dorsum with a sterile biopsy punch (5mm) in diameter, (6 mm) in depth, the wounds were divided into control groups where the wounds were left to heal spontaneously, and experimental groups where fenugreek oil was applied. Sacrification of all animals was done for the healing periods (1, 3 and 7

days).Specimens were prepared for histological analysis.Clinical assessment of wound contraction was done as well as inflammatory cell count, epithelial thickness and blood vessels count. Tissue expressions of interleukin-6(IL-6) was determined by immunohistochemical investigation.

**Results:**In this study the contraction of the wound was enhanced as the mean values decreased with time, and the lowest values at day 7 at the experimental side.

The histological findings showed that, the mean values of the inflammatory cells were highest at 1<sup>st</sup> day at the experimental and control side with significantly higher in experimental group. The mean values of the epithelial thickness were significantly higher in experimental group than that in control group at all healing periods. The mean values of blood vessels was significantly higher in experimental group at day 3.

The immunohistochemical localization of IL-6 showed dermal mean values of expression was significantly higher in experimental group than that at control group at day 3 and 7, while epidermal expression was significantly higher in experimental group at day 3.

**Conclusion:** findings of this study have shown that local application of fenugreek oil was effective in enhancing cutaneous wound healing.



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تقييم دور التطبيق الموضوعي لزيت الحلبة في شفاء الجروح  
الجلدية في الجرذان بواسطة التحليل النسيجي و الكيمياء  
النسيجية المناعية (انترلوكين-٦)

رسالة

مقدمة الى مجلس كلية طب الاسنان /جامعة بغداد  
كجزء من متطلبات نيل درجة الماجستير في أنسجة الفم

من قبل

شذى حميد علي

بكالوريوس طب و جراحة الفم و الاسنان

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ماجستير أنسجة الفم و علوم الحياة

دكتوراه أنسجة الفم و علوم الحياة