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Histological evaluation of the effect of Aloe Vera gel on periodontium healing in rats (Immunohistochemical study on syndecan 1 , 4)

A thesis

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Abstract

Background: Injury to the periodontal tissue can occur due to trauma or diseases, many of the treatment products used to treat this condition have side effects, mostly, developing bacterial resistance, altered taste sensation, or may cause discoloration of teeth, and mucosa. *Aloe vera* is a plant that has many basic ingredients in its extracted gel that acts as a wound healing accelerator in addition to that it's safe, and economical and without recordable side effect.

Aims of study:

1-Histological evaluation of the biological effect of aloe vera gel on periodontium wound healing (in rats).

2-Immunohistochemical investigation for expression of syndecan 1 and 4 by periodontium tissues during healing for all periods.

Materials and methods: Thirty six male Albino rats were used in this study. The animals were subjected for non-surgical operation of distal sides of both lower anterior teeth to create periodontal defect. The animals were divided into control and experimental group as follows:

A. Control group; the periodontium defect left without any treatment

B. Experimental group includes:

- **Group 1** contains (18) rats, the periodontium defect treated with 1 μ L normal saline.
- **Group 2** contains (18) rats, the periodontium defect treated with 1 μ L of *Aloe vera* gel.

The animals were sacrificed at three periods 3,7,14 days (6 rats for each period).

Histological examination with assessment of histometry analysis include the width of new (periodontal ligament, cementum), amount of new bone, length of junctional

epithelial ,and rate of maturation at 14th day.Also immunohistochemical investigation for expression of syndecan 1 and syndecan 4 were performed on specimens,for all groups over all periods.

Results: Histological findings of the present study showed that *A. vera* treatment enhanced periodontium healing by induced apposition of cementum, new periodontal ligament, and formation new mature bone.

Immunohistochemical examination of this study revealed that the *A. vera* treatment increase expression of syndecan -1&-4 with dominancy of syndecan 4 by epithelial cell, osteoblasts, fbroblast ,stromal cells and with highly significant differences in comparison with control and saline.

Conclusion: Aloe vera gel accelerated the healing process in periodontium defect in comparison to the normal physiological healing process .