

Chemotactic and proliferative responses of human gingival fibroblasts (HGFs) to insulin-like growth factor-1 (IGF-1)

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Background: It has been demonstrated the Insulin-like Growth factor-1 (IGF-1) has mitogenic and chemotactic effects on various cell lines. The aim of the present study was to assess the chemotactic and proliferative response of human gingival fibroblasts (HGFs) to IGF-1.

Methods: Gingival fibroblasts were obtained from the gingival tissue of medically and periodontally healthy patients. Chemotaxis assay was performed in modified Boyden chambers using Transwell® permeable inserts. The lower chamber of each well was filled with growth medium containing IGF-1 at different concentrations (0, 50, 100, 500, 1000 ng/ml). The cell suspension was placed on the top of the filters. Cell migration was assessed after 4 hours of incubation by counting the number of cells on the bottom surface of membranes using confocal microscopy. The proliferative effect of IGF-1 was evaluated by direct cell count. HGFs were plated in 24-well plates in growth medium supplemented with IGF-1 concentrations of 0, 50, 100, 200, 500, and 1000 ng/ml. The relative proliferation rate of cells was evaluated after 3, 5 and 7 days, by counting the nuclei of cells using Epifluorescence light microscope.

Results: IGF at a concentration of 50 ng and 100 ng showed a significant chemotactic effect on HGFs compare to the negative control ($P=0.0221$, $P=0.0009$, respectively). Regarding proliferation assay, no statistically significant differences were seen between the groups containing IGF-1 and negative control at any time point ($P>0.05$).

Conclusion: While HGFs showed a dose-dependent chemotactic response to IGF-1, they did not demonstrate any significant proliferative reaction to this growth factor.

Keywords: human gingival fibroblast, insulin-like growth factor, chemotaxis, proliferation