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Impact of microRNA-210 on wound healing among the patients with diabetic foot ulcer

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Abstract

Aim

Diabetic foot ulcer (DFU) is a major concern in diabetes and its control requires in-depth molecular investigation. The present study aimed to screen the expression of microRNA-210 (miR-210) and its association in hypoxic pathway in DFU patients.

Methods

The study consists of 3 groups of circulation samples (50 in each group of: healthy volunteers, T2DM and T2DM with DFU) and 2 groups of tissue samples (10 in each group of: control and T2DM with DFU). Expression of miR-210 and hypoxia inducible factor-1 alpha (HIF-1α), and its responsive genes such as VEGF, TNF-α, IL-6, BCl2, Bax and Caspase 3 were analyzed by RT-PCR, Western blot and ELISA analyses.

Results

The HIF-1α expression decreased in DFU patients with increased miR-210 expression in both circulation and tissue biopsies. The circulatory IL-6 and inflammatory gene TNF-α expression was increased in DFU compared to healthy controls and T2DM subjects. Further, we found there was no alteration in the angiogenic marker, VEGF expression. In comparison, anti-apoptotic BCl2 was decreased and Bax and Caspase 3 was increased in DFU tissues relative to control.

Conclusions

The study showed that there was an inverse relationship between miR-210 and HIF-1α expression in patients with DFU, indicating that miR-210 may regulate the expression of the hypoxic gene.