WOUND HEALING

EXPRESSION OF ANGIOGENIC STIMULATORS AND MATRIX METALLOPROTEASES IN PATIENTS WITH VENOUS ULCERATIONS.

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Introduction. Chronic venous disease (CVD) is a disabling condition affecting about 1% to 3% of general population. Beside varicose veins, CVD can result also in formation of severe skin lesions, especially venous ulcerations (VU). The exact mechanism of VU ist still unknown, however some explanations regarding VEGF signaling pathway or involvement of extracellular matrix enzymes have been proposed. Nevertheless it remains unclear whether there is any connection between extracellular matrix protein and vascular stimulation factor levels in population affected by VU.

Objective: To evaluate expression of vasculogenesis stimulators (VEGF and angiogenin) and extracellular matrix proteins (MMP-1, MMP-9, TIMP-) in both healthy individuals and patients with VU.

Materials and methods: The study included 39 patients with venous ulcers and 32 healthy individuals who served as controls. Biopsy samples were obtained from lower leg areas and analyzed using enzyme-linked immunosorbent assay technique. Additionally propensity score matching analysis was used to rebalance both groups. To compare the groups t-Student together with Levene's test were employed.

Results: There was significant difference between study group and control group in MMP-1 and MMP-9 expression (14.16 ± 2.98 vs 6.08 ± 2.51, $p<0.001$; 12.45 ± 3.85 vs 6.77 ± 2.41, $p<0.001$ respectively) as well as in VEGF and angiogenin expression (589.33 ± 346.21 vs 220.28 ± 110.36, $p<0.001$; 1801.86 ± 415.66 vs 1104.81 ± 176.06, $p<0.001$; respectively). There were no significant differences between TIMP-1 expression.

Conclusions: Increased expression of both angiogenic factors and matrix metalloproteases in study group suggests their possible involvement in VU formation. Inhibition of disturbed VEGF/angiogenin signalling may be an interesting target for novel VU treatments.