VEGF-A-MEDIATED ANGIOGENIC RESPONSE TO A MULTILAYER WOUND DRESSING IN MECHANICAL SKIN INJURIES

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Introduction. Transition of a wound from the inflammatory to the proliferative phase depends on neoangiogenesis, and vascular endothelial growth factor A (VEGF-A) is its key regulator. Multilayer dressings that keep the wound moist are reported to speed granulation, but their effect on systemic angiogenic and immunoregulatory markers is little studied. The aim was to assess serum VEGF-A and IL-10 in patients treated with a multilayer wound dressing.

Materials and methods. A prospective controlled study included 120 subjects in four groups of 30: healthy volunteers; patients with mechanical skin injuries on admission; patients after standard complex treatment; and patients receiving standard treatment plus a multilayer wound dressing. In the last group blood was taken on day 3 after application. The groups were comparable by age, sex and wound type ($p > 0.05$). VEGF-A and IL-10 were measured by ELISA; one-way ANOVA with Tukey post hoc test was used ($p < 0.05$).

Results. VEGF-A rose stepwise across the groups (ANOVA $p < 0.001$): 236.84 ± 8.76 pg/mL in controls, 266.84 ± 10.37 on admission, 302.69 ± 10.56 after standard treatment and 348.15 ± 10.47 pg/mL with the dressing. The dressing group exceeded the standard-treatment group by 15.0% ($p < 0.001$) and controls by 1.47-fold. IL-10 moved the other way: 22.58 ± 3.35 pg/mL on admission, 19.47 ± 2.49 after standard treatment and 15.36 ± 2.16 pg/mL with the dressing, close to the control level of 13.86 ± 2.08 pg/mL.

Discussion. The highest VEGF-A level coincided with IL-10 returning towards normal. This pairing indicates stronger angiogenesis together with completion of the

inflammatory phase and restored balance between pro- and anti-inflammatory mechanisms. VEGF-A and IL-10 measured together may serve as a marker of the shift to the proliferative phase. Long-term remodelling was not assessed and requires further study.

Keywords: *VEGF-A, angiogenesis, IL-10, multilayer wound dressing, wound healing.*