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The Content of Dermal Collagen and Growth Factors in Blood Serum of Rats After Local Cold Injury

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The dynamics of the collagen content in rat dermis, the concentration of fibroblast growth factor (FGF-21), insulin-like growth factor (IGF-1) and vascular endothelial growth factor (VEGF-C) were studied in blood serum during restoration after local cold damage. Animals of the experimental group, in a state of narcotic sleep, contact frostbite of the 3rd degree was simulated on depilated back skin. On the 3rd, 7th, 14th and 21st days of the experiment, the content of growth factors and the percentage of collagen in the dermis were determined in blood serum. 3 days after the damage, a sharp decrease in the collagen content of the dermis was observed, which is associated with inflammatory processes. Starting from 14 days after cold damage, an increase in collagen content was observed, which allows one to judge about the restored activity of collagen producers, which lasted until the 21st day of the experiment, but complete restoration of the initial level did not occur. On the 3rd day, there is a tendency to a decrease in the concentration of growth factors (FGF-21, IGF-1, VEGF-C) in the blood serum simultaneously with a decrease in the collagen content in the dermis. The content of the studied growth factors increases on days 7, 14, and 21, but the dynamics of this increase is different for different factors. The level of FGF-21 peaked at 7-14 days, IGF-1 at 14-21 days and VEGF-C at 21 days, which may indicate an increase in the proliferation and activation of biosynthetic functions of dermal cells in the zone of local cold injury.

Keywords: fibroblast growth factor (FGF-21), insulin-like growth factor (IGF-1), vascular endothelial growth factor (VEGF-C), serum, collagen, frostbite, recovery