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Insulin-like growth factors (IGF) I and II, and IGF binding proteins 1, 3 levels in bone tumor patients blood serum

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Objectives: Bone tumors are a group of musculo-skeletal diseases that are extremely difficult to diagnose. The difficulty of biopsy and a large percent of non-informative punctures impose necessity to introduce serum biomarkers determination in patients with bone neoplasms for facilitating diagnostics. The objective of this study was to measure some insuline-like growth factor system components in blood serum of malignant and benign bone tumor patients and practically healthy persons in order to assess their associations with the key tumor characteristics.
Methods: 162 persons aged 14 - 69 years were involved in the study: 113 bone tumor patients (25 with osteogenic sarcoma, 21 - chondrosarcoma, 18 Ewing sarcoma, 5 - malignant fibrous histiocytoma, 14 - giant cell bone tumor, and 30 with various benign tumors) and 49 practically healthy people as a control. IGF-I, IGF-II, IGFBP-1, and IGFBP-3 levels were measured in blood serum with standard ELISA Assay Kits (DSL Inc, USA).
Results: Serum IGF-I levels were significantly higher in patients with malignant bone tumors than in those with benign lesions, and IGF-I level in benign bone tumor patients€sera was significantly higher than in control group. Serum IGF-II in malignant bone tumor patients was higher than in both benign bone tumor patients, and control persons. Serum IGF-I in patients with chondrosarcoma was significantly lower than in Ewing sarcoma and osteogenic sarcoma groups. IGFBP-1 levels did not differ between the whole group of bone tumor patients and controls. And serum IGFBP-3 was the highest in benign bone tumor patients, lower in patients with malignant tumors, and the lowest level of this protein was observed in control group. No significant associations of IGFs/IGFBPs serum levels with tumor localization, its size and type of affected bone were revealed.
Conclusions: IGF-I and IGF-II serum levels in patients with malignant bone tumors are elevated as compared to persons with benign bone lesions and practically healthy people, while serum IGFBP-3 level is the highest in benign bone tumor group. These results allow to suggest that IGF-I and IGF-II could be involved in pathogenesis of bone tumors, and IGFBP-3 might play a protective role in this process.

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