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ABSTRACT BOOK

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INFLUENCE OF ANTITUMOR CHEMOTHERAPEUTICS ON BONE METABOLISM IN THE AREA OF LONG BONE DIAPHYSIS DEFECT

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Introduction. Cancer patients have an increased risk of bone fractures, which heal on the background of antitumor chemotherapy. However, the effect of antitumor chemotherapeutics on the formation (anabolism) and resorption (catabolism) of bone regenerate tissue in the scientific literature we have not found.

Aim. to study the expression of markers of bone resorption of cathepsin K and bone synthesis of osteopontin in the defect of the diaphysis of the long bone under the action of antitumor chemotherapeutics.

Materials and methods. The experiment involved 96 white laboratory rats, which boron inflicted a defect with a diameter of 2 mm in the middle third of the fem shaft. Animals were divided into control and 3 experimental groups, which on the 1st, 21st and 42nd day after injury were injected intramuscularly with anticancer chemotherapeutics: I-doxorubicin (60 mg / mg), II-5-fluorouracil (600 mg / m²), III - methotrexate (40mg / m²). On the 15th, 30th, 45th, 60th day after injury, the animals were removed from the experiment. The expression of cathepsin K and osteopontin was evaluated by immunohistochemical method.

Results. On the 15th day of the experiment in all experimental groups in the bone defect found increased expression of cathepsin K. On the 30th day the expression of cathepsin K in group I was 31.17 ± 1.47%, in II - 30.67 ± 1.37 %, in III - 31.67 ± 1.75%, which is 9.37% ($p = 0.02$), 7.61% ($p = 0.04$) and 11.12% ($p = 0.01$) above control indicators. The intensity of staining of the cytoplasm of osteocytes is high (+++). On the 60th day, the expression of cathepsin K in group I was 28.50 ± 1.87% of cells, in group II - 26.67 ± 1.63%, in group III - 27.83 ± 1.17%, which is 25.72% ($p<0.005$), 17.64% ($p<0.005$) and 22.76% ($p<0.005$) more than in the control. The color intensity of the cytoplasm is moderate (++). However, the level of osteopontin expression in the regenerate area in all experimental animals was lower than the control values from the beginning of the study. On the 30th day it was in group I 17.33 ± 1.21%, in group II-18.50 ± 1.05%, in group III-17.50 ± 1.05%, which is 16.80% ($p<0.005$), 11.19% ($p<0.005$) and 18.15% ($p<0.005$) lower than in the control. The intensity of cytoplasmic staining is low. On the 60th day, the expression of osteopontin in group I was determined in 21.17 ± 1.47% of cells, in group II - 22.17 ± 1.47%, in group III-20.83 ± 1.17%, which is 20.62% ($p<0.005$), 18.87% ($p<0.005$) and 21.89% ($p<0.005$) lower than in the control. The intensity of staining of the cytoplasm of immunoactive cells is moderate.

Conclusions. The use of antitumor chemotherapeutics causes an increase in the expression of cathepsin K regenerate cells and a decrease in osteopontin expression, which indicates a slow formation of bone regenerate tissue, its low mineralization and increased resorption processes in the defect area.

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