

## The Role of Homocysteine in Bone and Cartilage Regeneration

**Authors :** Arif İsmailov, Naila Hasanova, Gunay Orujaliev

**Abstract :** Homocysteine (HCY) is an indicator of prognostic value in monitoring regenerative processes in osteoporosis and osteoporotic fractures. The osteoporosis is known to be a serious health and economic problem, especially for women in the postmenopausal period. The study was carried out on patients 45-83 years old divided into 3 groups: group I - 14 patients with osteoporosis, group II - 15 patients with non-osteoporotic fractures, group III - 25 patients with osteoporotic fractures. The control group consisted of practically healthy 14 people. A blood sample was taken at 3 stages to monitor the dynamics of HCY level: on the 1st day before treatment, on the 10th day of treatment and 1 month after it. Blood levels of Hcy were determined at a wavelength of 450 nm by the ELISA(Cloude Clone Corp.Elisa kits,USA). The statistical evaluation was performed by using SPSS 26.0 program (IBM SPSS Inc., USA).The results showed that on the 1st day before the treatment HCY concentration was statistically increased 2.7 times(PU = 0.108) in group I, 5.6 times (PU <0.001) in group II and 6.5 times (PU <0.001) in group III compared to the control group. Thus, the average value of HCY in group I was  $1.76 \pm 0.56 \mu\text{g/ml}$ ; in group II -  $3.57 \pm 0.62 \mu\text{g/ml}$ ; in group III -  $4.2 \pm 0.50 \mu\text{g/ml}$ . HCY level increases more sharply after fractures, especially in osteoporotic patients. In treatment period Vitamin D plays an important role in synthesis of the Cystathionine  $\beta$ -synthase enzyme, which regulates HCY metabolism. Increased Hcy levels could lead to an increase in the risk of fracture through the interference in collagen cross-linking.

**Keywords :** homocysteine, osteoporosis, osteoporotic fractures, Vitamin D

**Conference Title :** ICBC 2024 : International Conference on Bone and Cartilage

**Conference Location :** Tokyo, Japan

**Conference Dates :** February 26-27, 2024