Background: Osteoporosis is a common bone metabolism disease, characterized by low bone mass and pathological fractures. This disease is caused by loss of balance in bone resorption and formation. It is thought that this imbalance is associated with increasing in reactive oxygen species (ROS) and/or insufficiency of antioxidant defense (1). ROS adversely affect the formation and life cycle of osteoclasts, osteoblasts and osteocytes (2). Albumin has many functions such as the transport of molecules, the oncotic pressure of plasma and antioxidation. The damage of the ROS to the N-terminal of the albumin reduces the carrying capacity of the albumin and thus the antioxidant capacity. This damage is evaluated by decreasing the cobalt binding capacity of albumin called ischemia modified albumin (IMA), and IMA shows oxidative damage (3).

Objectives: The aim of this study was to determine IMA levels of patients with osteoporosis.

Methods: OP was diagnosed by t score of bone mineral density (BMD). IMA, albumin levels and IMA/Albumin ratio (IMAR) were studied from the sera of patients with osteoporosis (OP) and healthy volunteers (control) (4).

Patients who had any chronic disease such as diabetes mellitus, hypertension, and etc. or any acute disease such as infection were excluded from study. Results were shown as mean ± standard deviation or median (IQR) according to the distribution of variables. p<0.05 was considered significant.

Results: The study included 26 female patients in OP group and 26 female volunteer in control groups. The mean age was 65.5 ± 5.4 and 66.4 ± 7.4 for OP and control groups, respectively (p=0.616). Median (IQR) lumbar t scores of BMD of OP group were -3.1 (-3.32; -2.85). The albumin values of OP and control groups were 4.38 ± 0.13 and 4.40 ± 0.11, respectively; and no significant difference was found between the groups (p = 0.441). The IMA and IMAR results of the OP group were 0.65 (0.61; 0.74) and 0.15 (0.14; 0.17), respectively; and 0.46 (0.40, 0.55), and 11 (0.09; 0.13) in the control group, respectively. Both IMA and IMAR results were significantly lower in the OP group than in the control group (high ABSU) (p < 0.001; for all).

Conclusion: Cobalt binding capacity of albumin was decreased in patients with osteoporosis. To the best of our knowledge, this study is the first to determine IMA levels in osteoporosis. It is known that the cobalt binding capacity of albumin decreased after oxidative damage. It is shown that IMA is increased in some diseases associated with oxidative stress. Similarly, it was showed that thiol-disulphide balance was shifted to disulphide side in postmenopausal osteoporosis and it was an indicator of oxidative stress (1, 2). In the light of these results, oxidative stress is thought to play role in the pathophysiology of osteoporosis. As a result, antioxidant replacement such as N-acetylcysteine, lipic acid, vitamin C, etc. may be recommended to the patients with osteoporosis.