

## **SUMMARY**

**OBJECTIVE:** The first aim of this study was to compare the role of serum antioxidant enzymes and nitric oxide levels in pathogenesis of postmenopausal osteoporosis (OP). The second endpoint was to assess the relationship between these enzyme levels with RANKL and bone mineral density.

**MATERIALS AND METHODS:** Forty-five osteoporotic women and 42 non-porotic postmenopausal healthy controls were included in this study. Postmenopausal women without previous OP diagnosis and postmenopausal women who had no OP treatment history were included. Individuals that had previous diagnosis of OP or another bone metabolism disorders, self-reported fracture or subjects which has used antioxidant supplementation were excluded. None of these participants were smokers or having alcohol. DEXA results, body mass index and demographic data of these patients were noted. Serum catalase (CAT), glutathione (GSH), glutathione reductase (GR) enzyme activities and malondialdehyde (MDA) were measured by using atomic absorption spectrophotometer. Serum RANKL and nitric oxide (NO) levels were measured with ELISA.

**RESULTS:** Women with OP had significantly higher serum RANKL, MDA and NO levels. However they had lower serum GR enzyme activity when compared with controls. There was positive corelation between serum RANKL level and serum MDA level while, negative corelation between serum RANKL level and serum CAT levels were determined. Also there was correlation between serum RANKL and MDA levels with DEXA results. There was no correlation between serum RANKL and antioxidant enzyme levels with other parameters (age, age at menopause, duration of menopause, body mass index of the patients).

**CONCLUSIONS:** This study showed us that oxidant stress must be considered in pathogenesis of OP because of high serum MDA, RANKL levels and low serum GR level have determined in OP patients. In addition, it can be postulated that high serum NO level might be responsible for bone loss in OP patients. In conculusion, it was asserted that the presence of oxidant stress and high level of NO might have a major role in pathogenesis of postmenopausal OP by RANKL.

**KEY WORDS:** Osteoporosis, RANKL, antioxidant enzyme, nitric oxide