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Association of serum sex steroid levels and bone mineral density with CYP17 and CYP19 gene polymorphisms in postmenopausal women in Turkey

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ABSTRACT. Many clinical conditions, including osteoporosis, are associated with serum levels of sex steroids. Enzymes that regulate rate-limiting steps of steroidogenic pathways, such as CYP17 and CYP19, are also regarded as significant factors that may cause the development of these conditions. We investigated the association of two common polymorphisms, in the promoter region (T→C substitution) of CYP17 and exon 3 (G→A) of CYP19, with bone mineral density (BMD) in the lumbar spine and femoral neck and serum androgen/estradiol, in a case-control study of 172 postmenopausal women aged 62.3 ± 9.6 years (mean ± SD). The CYP17 TC genotype was significantly overrepresented in patients compared to controls, and TC genotype neck T-score and lumbar T-score values were significantly higher in patients compared to controls. CYP17

TC and TT genotype testosterone and DHEA-SO_4 levels were lower in patients compared to controls. All three genotypes of CYP19 had almost the same distribution among patients. The CYP19 AG genotype, however, was most frequent among controls. CYP19 lumbar BMD levels were close to each other among the different genotypes; however, AA and AG genotypes were significantly lower in patients. Testosterone and DHEA-SO_4 levels in the CYP19 GG genotype were higher compared to those of the other genotypes in patients but not in controls. CYP19 GA individuals had lower E_2 levels and lower BMD in controls and patients. Femoral neck BMD and lumbar T-score were also diminished with GA transition. In conclusion, CYP17 and CYP19 gene polymorphisms were found to be associated with osteoporosis in postmenopausal women in Turkey.

Key words: BMD; CYP17; CYP19; Estradiol; Osteoporosis; Polymorphism

