Bone mineral density in patients with premature ovarian insufficiency. The role of hormonal replacement therapy.

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Context: Premature ovarian insufficiency (POI) is a state characterised by decreased estradiol (E2) concentration due to insufficient ovarian function before the age of 40. Hypoestrogenism in this group of women can lead to decreased bone mineral density (BMD).

Objective: The aims of the study were to compare BMD between POI patients and healthy subjects and to compare BMD before and after hormonal replacement therapy (HRT) in POI patients.

Methods: In every patient we assessed serum concentration of: FSH, LH, prolactin, E2, dehydroepiandrosterone sulfate, testosterone, TSH, fT4, fasting glucose and insulin level in the follicular phase.

Patients: Studied group included 132 POI patients (mean age 33±10 years). Control group constituted of 17 healthy age and weight-matched controls (mean age 23±6 years). The criteria of POI diagnosis were secondary amenorrhea of at least 3 months duration, FSH serum concentration >40 IU/l and E2 serum concentration <50 pg/ml.

Interventions: POI patients underwent HRT for mean duration of 3±2 years.

Main Outcome Measures: BMD in the lumbar spine was measured by dual-energy X-ray absorptiometry (DXA) before and after HRT.

Results: In POI patients mean BMD (1.087 ± 0.13 g/cm2) was significantly lower than in the control group (1.150 ± 0.30 g/cm2; p=0.04). Similarly T-score was significantly lower in POI group (-0.75±1.16) when compared to healthy controls (-0.14±0.8; p=0.03). BMD and other parameters in POI patients before treatment were significantly lower than in POI patients after HRT. There was a statistically significant difference in BMD (before HRT 1.087 ± 0.13 g/cm2; after HRT: 1.109±0.13 g/cm2; p<0.001), T-score (before HRT: -0.75 ± 1.16; after HRT -0.59 ± 1.22; p<0.001) and Z-score (before HRT: -0.74±1.11; after HRT: -0.49±1.11; p<0.001) in POI group before and after HRT. BMD and T-score correlated positively with body mass index (p=0.03; r=0.19 for BMD and p=0.02; r=0.2 for T-score) in POI group. Such correlation was not observed in control group. Moreover BMD in POI patients before HRT correlated positively with LDL concentration (p=0.03; r=0.2), and negatively with FSH concentration (p=0.02; r=-0.2).

Conclusions: POI patients are characterised by lower BMD and T-score than age and weight-matched healthy controls. In POI patients group HRT significantly increases BMD and T-score.

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