

Interactions of Socioeconomic Status, Age at Menarche, Body Composition and Bone Mineral Density in Healthy Turkish Female University Students

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Abstract : Introduction: Peak bone mass is reached in late adolescence in females. Age at menarche influences estrogen exposure, which plays a vital role in bone metabolism. The relationship between age at menarche and bone mineral density (BMD) is still controversial. In this study, we investigated the relationship between age at menarche, BMD, socioeconomic status (SES) and body composition in female university student. Participant and methods: A total of 138 healthy girls at late adolescence period (mean age 20.13 ± 0.93 years, range 18-22) were included in this university school-based cross-sectional study in the urban area western region of Turkey. Participants have been randomly selected to reflect the university students studying in all faculties. We asked relevant questions about socioeconomic status and age at menarche to female university students. Students were grouped into three SES as lower, middle and higher according to the educational and occupational levels of their parents using Hollingshead index. Height and weight were measured. Body Mass Index (BMI) (kg/m^2) was calculated. Dual energy X-ray absorptiometry (DXA) was performed using the Lunar DPX series, and BMD and body composition were evaluated. Results: The mean age of menarche of female university student included in the study was 13.09 ± 1.3 years. There was no significant difference between the three socioeconomic groups in terms of height, body weight, age at menarche, BMD [BMD (gr/cm^2) (L2-L4) and BMD (gr/cm^2) (total body)], and body composition (lean tissue, fat tissue, total fat, and body fat) ($p > 0.05$). While no correlation was found between the age at menarche and any parameter ($p > 0.05$), a positive significant correlation was found between lean tissue and BMD L2-L4 ($r = 0.286$, $p = 0.01$). When the relationships were evaluated separately according to socioeconomic status, there was a significant correlation between BMD L2-L4 ($r = 0.431$, $p = 0.005$) and lean tissue in females with low SES, while this relationship disappeared in females with middle and high SES. Conclusion: Age at menarche did not change according to socioeconomic status, nor did BMD and body composition in female at late adolescents. No relationship was found between age at menarche and BMD and body composition determined by DEXA in female university student who were close to reaching peak bone mass. The results suggested that especially BMD L2-L4 might increase as lean tissue increases.

Keywords : bone, osteoporosis, menarche, dexa

Conference Title : ICBHCA 2023 : International Conference on Bone Health in Children and Adolescents

Conference Location : Tokyo, Japan

Conference Dates : December 04-05, 2023