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Changes in the Pattern of Body Components during Puberty

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ABSTRACT The purposes of this study were to study the sexual differences in body components during puberty, to analyze age changes in body components and to study the effect of sexual maturity status on body composition in Hungarian adolescents. The subjects of the present sample of the 2nd Hungarian National Growth Study (Eiben et al. 1991; Bodzsár, 2004) were 5542 such children (2769 girls and 2873 boys aged 10-16 yrs) that had already begun pubertal development. The girls were subdivided by the maturation stages of the breast, while the boys by those of the genitals. Percentage of body fat was estimated by model of two components (Durnin and Rahaman, 1967; Siri, 1956), while masses of body components (fat, bone, muscle and residual mass) were assessed by the Drinkwater and Ross (1980) four-component anthropometric fractionation method. Sexual differences in body composition, present already in childhood, became more accentuated during puberty, due mainly to growing fat content in the girls and to increasing lean body mass in the boys. In the females early maturers were heavier and contained more fat than less mature girls. This increase in relative and absolute fat mass was proportionate to weight gain. In the males increasing fat mass lagged behind the gain in lean body mass both with advancing age and maturity status. Body composition and maturity status are closely interrelated in both genders while gender-specific tendencies increase dimorphism and the several factors making up the differences between maturation types. Fat content was greater in both sexes in the early maturers. Also the developmental rate of prepubertal fat accumulation was faster in the early maturers when compared to those maturing later. Standards for the age change of body composition can therefore inform us not only about the development of bone, muscle and fat in childhood, but also allow a short-range prediction of pubertal events.