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Original Article

SOMATIC AND SEXUAL MATURITY IN PERIPUBERTY (A LONGITUDINAL STUDY OF MOSCOW SCHOOLGIRLS)

The issue of the association between somatic and sexual maturity is relevant in population monitoring due to significant variability in this association between groups and over time. This study examines the age-related changes in somatic dimensions (height, weight and pelvic diameter), breast development and age at menarche in Moscow schoolgirls aged 8–17 years, who were observed over a period of nine years (1982–1991). A total of 125 individuals were included in the study. First, the patterns of one-year dimension gain dynamics were calculated, then they were smoothed using the least squares method. The smoothed curves were used to determine the peak gain of each dimension in years, the absolute level of the peak in centimeters, kilograms or scores, and the delta (in years) between the peak of the dimension and menarche. Peak height velocity (PHV) occurs 1.5 years before menarche (at 13.03 years), peak pelvic velocity (PPV) occurs 0.5 years before, and peak breast development occurs 1 year before menarche. Peak weight velocity (PWV) coincides with menarche; therefore, PHV is the most likely trigger of menarche. The high correlation between PHV and PPV, PMV and menarche (0.62–0.68) suggests that PHV is a key factor in puberty and may reflect common genetic regulation of the dynamics of the parameters under discussion. This conformity is supported by the results of factor analysis. The first 'general' factor of development rate in puberty has the most significant positive loadings on PHV (0.88), PPV (0.82), PWV (0.85) and age at menarche (0.75). The earlier somatic pubertal acceleration occurs, the earlier menarche occurs — and vice versa. According to factor analysis, the final somatic status (e.g. definite height) does not depend on pubertal events. The same applies to breast development, which has independent dynamics throughout puberty.

Keywords: *biological anthropology, schoolgirls aged 8–17 years, sexual maturation, menarche, peak height velocity*

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