

Research Paper :

Assessment of the growth parameters of adolescent girls in relation to menarche

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ABSTRACT

The present study was conducted on adolescent girls of Varanasi and Sonbhadra districts, to assess their growth parameters in relation to menarche. 656 samples were taken from urban (Varanasi) and tribal (Sonbhadra) areas. The mean age at attainment of menarche (AM) in Varanasi was 12.93 years and in Sonbhadra 13.38 years. Sonbhadra girls who attained menarche (AM) had better mean value of growth parameters than Varanasi girls who attained the menarche.

Key words : Adolescent, Growth parameters, Attainment of menarche (AM)

Growth and development depend on both genetic and hereditary background of the individual and the physical and cultural environment into which the person is born. The maximum growth takes place in the adolescent phase. Adolescent growth spurt is a constant phenomenon. The spurt occurs at different ages among girls in any population, whereas the mean age may vary considerably from one population to another. The adolescent girls spurt takes place two years earlier than in boys (Tanner, 1962; Agarwal, 1974).

Indian Council of Medical Research (1972) reported higher mean value for height and weight observed in urban high socio-economic and higher per capita income group. Gupta *et al.* (1990) observed that the rural girls have a delayed and slower gain in physical growth characteristics than urban well to do girls. Sachar *et al.* (1997) also observed that the growth of Punjab adolescent girls have lower growth performance when compared with their urban counterpart and delayed growth spurt.

Tanner (1962) found that girls at menarche are taller and heavier than those of the same age who have not attained menarche. The correlation between the growth status the age at menarche is so much that Frisch and Revelle (1970) had hypothesized that a critical weight of 47-48 kg. and mean height at menarche was 158 ± 0.50 cm. The mean height increases significantly ($P < 0.97$ cm. to 160.9 ± 1.4 cm.) as the mean age of menarche increased from 11.4 to 11.5 years. But the mean weight at menarche 48 kg. remained constant, a change in metabolic rate may trigger the onset of menarche.

Early matures grow more rapidly in height and weight than late matures during the adolescent spurt. (Shuttleworth, 1937; Simmons and Greulich, 1943). Late

matures also take longer to attain menarche after attainment of maximum rate of growth (Frisch and Revelle, 1969a). Early and late matures are of same height (Frisch and Revelle, 1969b), but the late matures are lighter in weight (Ellison, 1982; Frisch and Revelle 1969, 1971).

At the initiation of the spurt, the unchanging mean weight and at menarche in early and late maturing girls suggests that the attainment of a critical body weight may be essential for each of these events of adolescence. (Frisch *et al.* 1973). A significant relationship was found between the growth curve of height and the time of menarche. Although menarche occurs during the descent of the height velocity curve, some have the menarche soon after the time of peak velocity and still have a relatively great growth potential at the time of menarche. Observations indicate that growth after menarche is affected not only by the age of menarche but the increment of height during the year prior to the menarche. It is reasonable to say that the height at the time of menarche is not the determinant of adult height and girls who attained menarche at an early age are not necessarily short in their adult height even if their height at time of menarche were relatively shorter. (Frisch and Revelle, 1969, Tanner *et al.*, 1966).

METHODOLOGY

The growth parameters of adolescent girls in relation to menarche was assessed in present study. Multy-stage random sampling method was used for selecting the samples from urban and tribal areas. For urban area, Varanasi city and for tribal study, Sonbhadra villages were selected. A total sample of 656 adolescent girls was