

Menarche and Lifestyle

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Menarche is the result of endometrial proliferation brought on by increasing ovarian hormonal output. The ovary is stimulated by rising pituitary gonadotropin production, which is signaled by increasing cyclic GnRH release from the hypothalamus. Various neuronal and endocrine inputs are thought to contribute to the increased GnRH release. However, their exact interactions and relative contributions are yet to be determined. The prevailing hypothesis suggests that there is a release of the GnRH neurons from the inhibitory effects of higher central nervous system (CNS) centers at the onset of puberty. Much attention has been made towards studying environmental triggers for menarche that presumably modulate these higher CNS centers.

In this month's issue of the *Wisconsin Medical Journal*, Trentham-Dietz and colleagues examine some possible behavioral triggers for menarche in a group of southern Wisconsin sixth graders and find a number of interesting results. They confirm the relationships between sedentary behavior, weight, and menarche. The children who watched more television, were involved in fewer hours of sporting activity, and weighed more, were more likely to have an earlier menarche. They also confirmed the correlation between age of menarche of mothers and daughters.

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The mean age of menarche in the United States decreased between 1900 and 1973 from 14 years to 12.8 years and then stabilized.¹ A later maturation age may have been adaptive for past societies that did not have the ready access to abundant food that we now have. It may have allowed greater time for the accumulation of body fat in preparation for the increased caloric needs of pregnancy and breastfeeding. Studies from other populations also confirm that as modern socioeconomic levels are reached with good general nutrition and health, the mean age of menarche falls and then stabilizes; in contrast, for nutritionally deprived societies the mean age of menarche can be as high as 17 years.¹

Menarche does not imply the full range of complex cyclic events involved with reproductive competency. However, generally it does precede fertility by a relatively short time in human terms. In many cultures this time has been the focus of transitional rites often leading to pair bonding and reproduction shortly thereafter. However, in our society as the age of menarche has decreased, the age at which childbearing is encouraged has been delayed. Therefore, menarche has become less of a social milestone.

Rather than indicating a coming of age, menarche often signals a long period of closer adult supervision, organized group activities, and more intense education with transmission of moral values. Although early childbearing still does occur and is

no longer severely ostracized, it may contribute to marginalization, dependency, and poverty. The learning of the necessary life skills for success in our competitive society with its complex social organization may be inadequate and may be further delayed or never attained. Some of the most intense current public debates about biosocial issues (abortion, morning after pill) relate to this long period of reproductive competency for childbearing before social competency is achieved for childrearing.

It is interesting that the early pubertal endocrinologic changes associated with modern society have worked against changes in perceived social maturity. At times, some of the parents, adult supervisors, and teachers might wish that modern changes in the timing of reproductive endocrine events might lead to a later age of menarche rather than earlier. This study implies that watching less TV, doing more exercise, and gaining less weight might help in this regard.

Trentham-Dietz and colleagues also point out that having a later age of menarche is associated with a lower chance of breast cancer later in life. However, they also warn that delayed menarche may be associated with poorer bone health later in life. There is, therefore, no clear medical recommendation for effecting the age of menarche at this point.

Reference

1. Berenberg SR, ed. *Puberty, Biologic and Psychosocial Components*. Leiden, HE:Steinfert Kroese;1975:256-273.