



Letter to the Editor

Effect of Age at Menarche on Obesity Epidemic

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Abstract

Menarche is a sign of puberty and the beginning of ovarian and other endocrine functions relating to reproduction. It is an important event demonstrating the end of childhood and the start of reproductive years for each woman that is preceded by the complex process of some hormonal changes in the puberty period. Moreover, it is an important clinical indicator of girls' physical, nutritional, and reproductive health. Early age at menarche, as the onset of menstrual periods in girls, has a substantial effect on their physical and sexual health and is related to the increased risks of unfavorable health outcomes. Further, menarche appears to be associated with several risk factors of emergent chronic disease. In recent decades, the age at menarche has shown a gradual decline from 16-17 years to less than 13 years. Evidence indicates that childhood obesity is related to earlier menarche. Finally, this change may be partially explained by the global epidemic of obesity.

Keywords: Menarche, Obesity, Epidemic

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Dear Editor,

Menarche is the beginning of the first menstruation and an indicator of puberty in women¹. However, early maturity is considered a significant public health issue because of its association with the early initiation of sexual activities.² Over the last century, the age at menarche has decreased worldwide³ and averages about 12 and 13 years.⁴ Furthermore, early age at menarche has been reported to be related to the future risk of unfavorable health results,⁵ including type 2 diabetes mellitus,⁶ metabolic syndrome,⁷ cardiovascular disease,⁸ breast, ovarian and endometrial cancer,⁹ spontaneous abortion, and obesity and mortality.¹⁰ Various factors affect the age at menarche, including genetic, geography, dietary habits, social, economic, physical exercise, and even climate.^{11,12} Overweight and increased body mass index (BMI) have been among significant changes in females and most probably as substantial agents that affect the age at menarche.¹³ A decrease in the age of menarche is suggested as one of the many factors resulting in the epidemic of obesity (Figure

1).¹⁴

A downward trend in pubertal timing results from the growth in the prevalence of overweight and obesity.¹⁵ Some researchers presume that some body fats are essential in female teenagers and minimum weight is needed to start menstruation.¹³ Additionally, increased adiposity may trigger estrogen production and result in the early initiation of menarche. Moreover, it has been reported that childhood BMI has a causal effect on the risk of the early age at menarche.⁹ Furthermore, earlier age at menarche is related to a higher risk of midlife obesity. One reason is related to the hypothesis that higher androgen concentrations leading to earlier age at menarche promote the development of obesity.¹⁶ The other research evaluated the effect of intrauterine growth and low birth weight on the earlier and rapid puberty developments.¹⁷

In conclusion, the earlier age of menarche is associated with obesity and increased BMI. In addition, it is possibly the reason for the global obesity epidemic. Thus, it is better to prevent obesity in girls as a modifiable factor before puberty.

Conflict of Interest Disclosures

None.

Ethical Approval

Not applicable.

References

- Li H, Song L, Shen L, Liu B, Zheng X, Zhang L, et al. Age at menarche and prevalence of preterm birth: results from the

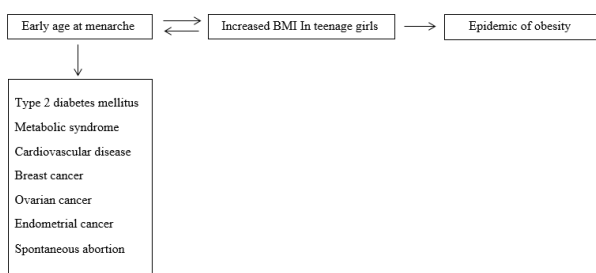


Figure 1. Conceptual Framework for Early Age at the Menarche and Epidemic of Obesity.

- Healthy Baby Cohort study. *Sci Rep.* 2017;7(1):12594. doi: 10.1038/s41598-017-12817-2.
2. Gharravi AM, Gharravi S, Marjani A, Moradi A, Golalipour MJ. Correlation of age at menarche and height in Iranian student girls living in Gorgan--northeast of Iran. *J Pak Med Assoc.* 2008;58(8):426-9.
 3. Noipayak P, Rawdaree P, Supawattanabodee B, Manusirivithaya S. Age at menarche and performance intelligence quotients of adolescents in Bangkok, Thailand: a cross-sectional study. *BMC Pediatr.* 2016;16:87. doi: 10.1186/s12887-016-0624-8.
 4. Wang Z, Dang S, Xing Y, Li Q, Yan H. Correlation of body mass index levels with menarche in adolescent girls in Shaanxi, China: a cross sectional study. *BMC Womens Health.* 2016;16:61. doi: 10.1186/s12905-016-0340-4.
 5. Baek TH, Lim NK, Kim MJ, Lee J, Ryu S, Chang Y, et al. Age at menarche and its association with dysglycemia in Korean middle-aged women. *Menopause.* 2015;22(5):542-8. doi: 10.1097/gme.0000000000000353.
 6. Ley SH, Li Y, Tobias DK, Manson JE, Rosner B, Hu FB, et al. Duration of reproductive life span, age at menarche, and age at menopause are associated with risk of cardiovascular disease in women. *J Am Heart Assoc.* 2017;6(11). doi: 10.1161/jaha.117.006713.
 7. Elsehely I, Abdel Hafez H, Ghonem M, Fathi A, Elzehery R. A cutoff for age at menarche predicting metabolic syndrome in Egyptian overweight/obese premenopausal women. *Diabetes Metab J.* 2017;41(2):146-9. doi: 10.4093/dmj.2017.41.2.146.
 8. Yang L, Li L, Millwood IY, Peters SAE, Chen Y, Guo Y, et al. Age at menarche and risk of major cardiovascular diseases: evidence of birth cohort effects from a prospective study of 300,000 Chinese women. *Int J Cardiol.* 2017;227:497-502. doi: 10.1016/j.ijcard.2016.10.115.
 9. Mumby HS, Elks CE, Li S, Sharp SJ, Khaw KT, Luben RN, et al. Mendelian randomisation study of childhood BMI and early menarche. *J Obes.* 2011;2011:180729. doi: 10.1155/2011/180729.
 10. Amiri M. Early age at menarche and mortality. *Acta Persica Pathophysiol.* 2016;1:e10.
 11. Xing C, Huang Z, Li J, Li M, Xu L, Tao J, et al. Interactions of physical activity and body mass index with age at menarche: a school-based sample of Chinese female adolescents. *Eur J Obstet Gynecol Reprod Biol.* 2017;218:68-72. doi: 10.1016/j.ejogrb.2017.09.018.
 12. Cassidy-Bushrow AE, Peters RM, Burmeister C, Bielik LF, Johnson DA. Neighborhood-Level poverty at menarche and prepregnancy obesity in African-American women. *J Pregnancy.* 2016;2016:4769121. doi: 10.1155/2016/4769121.
 13. Mohamad K, Jamshidi L, Nouri Jelyani K. Is age of menarche related with body mass index? *Iran J Public Health.* 2013;42(9):1043-8.
 14. Wronka I. Association between BMI and age at menarche in girls from different socio-economic groups. *Anthropol Anz.* 2010;68(1):43-52. doi: 10.1127/0003-5548/2010/0066.
 15. Bratke H, Bruserud IS, Brannsether B, Aßmus J, Bjerknes R, Roelants M, et al. Timing of menarche in Norwegian girls: associations with body mass index, waist circumference and skinfold thickness. *BMC Pediatr.* 2017;17(1):138. doi: 10.1186/s12887-017-0893-x.
 16. Gallicchio L, Flaws JA, Smith RL. Age at menarche, androgen concentrations, and midlife obesity: findings from the Midlife Women's Health Study. *Menopause.* 2016;23(11):1182-8. doi: 10.1097/gme.0000000000000691.
 17. Khoshnevisasl P, Sadeghzadeh M, Mazloozadeh S, Ahmadiafshar A, Babri L. Age at menarche and its related factors among school girls, in Zanjan, Iran. *Int J Pediatr.* 2017;5(4):4755-62. doi: 10.22038/ijp.2017.21178.1779.