

Puberty, Menarche, and the Menstrual Cycle: What Do We Know, and What Do We Teach?



The process of pubertal development that ultimately leads to menarche is a critical process in the lives of all women. Understanding normal puberty and normal menstrual function is essential to understanding health and disease among girls and young women. It is crucial to the care that we, as pediatric and adolescent gynecologists and adolescent medicine specialists, provide. There is certainly a great deal about pediatric endocrinologic function that we currently understand, but our understanding is still evolving, and there are fascinating aspects of pubertal growth and trajectory that we do not fully understand.

In this issue of our *Journal of Pediatric and Adolescent Gynecology* (JPAG), Biro and colleagues continue their exploration of the processes of normal puberty, publishing data on the Age of Menarche in a Longitudinal US Cohort.¹ The Breast Cancer and the Environment Research Program enrolled girls at 6–8 years of age, followed them over a number of years, and determined the reported age of menarche (as reported both by the girls themselves and by a parent) and the tempo of puberty. It's good to know that parents and girls agreed on the age of menarche, although in this study, reports were closely contemporaneous to the event of menarche. As I teach my students, it is likely that the longer ago an event, the less accurate a report becomes; ie, asking a menopausal woman how old she was when she had her first period is almost certainly going to be less accurate than if I ask a 12 year old who had her first period 2 months ago. Biro and colleagues determined that the median age at menarche was 12.25 years, and that compared to black participants, Hispanic girls were more likely to have an earlier menarche; white and Asian girls were more likely to have a later menarche. Age of menarche was found to be highly correlated with breast development and inversely correlated with BMI. Girls with earlier breast development had a slower tempo of puberty (interval from breast development to menarche). Body mass index (BMI) had a greater impact on age at menarche than did race and ethnicity. The authors comment on previous reports from their longitudinal study as well as other studies showing a modest decrease in the age at menarche over time (by a few months over the past 25 years), but a much more robust decline in the onset of breast maturation. Indeed, the interval from initial breast development (Tanner Stage B2) to menarche may be increasing over time, with earlier studies showing an interval closer to 2 years, and the current Biro report showing 3.0 years for white girls and 2.9 years for black girls. Beyond serving as a rough guide to predicting menarche to help girls and their moms in my practice prepare for the onset of their first menstrual period, this

information may suggest how a better understanding of puberty can have implications for future health. The authors speculate that the earlier onset of breast development coupled with a slower tempo through puberty could potentially be related to adult morbidities (such as risk for breast cancer) through an expanded window of susceptibility to environmental exposures. Data from the same longitudinal study has also looked at bone density and timing of puberty, with the finding that earlier onset of puberty was associated with higher bone mineral density (BMD).² Wow—such interesting thoughts and fascinating areas for future investigation.

Using the menstrual cycle as a vital sign, like pulse, respiration, and blood pressure, has been recommended as providing important information about overall health and well-being.^{3–5}

Knowing about normal menstruation—what is normal with regard to menarche, and parameters of menstrual cyclicity—is essential in caring for adolescent girls and young women. The description of the menstrual cycle as a vital sign is one that I frequently use in talking to my patients. When I see an adolescent who previously had regular menstrual cycles, but is now amenorrheic or having very irregular menstrual bleeding, I explain that her body is sending her a message that something is out of balance with her health, and we need to figure out what that message is so that we can help her to be as healthy as possible.

In my clinic with ob/gyn and pediatrics residents, I insist that when they present a patient to me, they give me an “identifying sentence” that includes the patient's age, whether she's ever been pregnant (her gravidity and parity), the date of onset of her last menstrual period (LMP), information about whether she has been sexually active (SA), whether she is taking any hormonal therapy (HT) or birth control medication, and her chief concerns (CC)—(AGE, G P, LMP, SA, HT, CC). Beyond helping me to think more logically about the patient's clinical problem, obtaining this information is essential in providing her medical care, and thus is information that they need to have for ANY adolescent whom they are seeing for clinical care. As an example, I tell the pediatrics residents that if they are going to prescribe doxycycline for an adolescent's acne, they need to know whether she might be pregnant or at risk for having an unintended pregnancy, as this commonly prescribed medication is contraindicated in pregnancy. This issue of JPAG includes an article on Menstrual Characteristics and Related Problems in 9–18 year old Turkish girls as we learn more about health and health education in different populations and cultural contexts.⁶ This study found high rates

of menstrual pain, but infrequent medical consultation regarding this issue. In order to address menstrual problems in girls and young women around the world, in an effort to minimize the impact of menstruation on daily lives and school attendance, we need to be comfortable asking the questions about menstrual function and addressing menstrual problems including dysmenorrhea, heavy bleeding, and irregular cycles.

Another study published in this month's JPAG, Pediatric and Gynecologic Rates of Documentation of Last Menstrual Period in Adolescent Females, reports on documentation of the date of a last menstrual period at clinical encounters.⁷ As I was taught regarding the medical record, if information is not charted, the question didn't get asked. In this study, PAG clinicians were more likely to document LMP than were other specialists, which suggests that we need to continue to educate our colleagues about the importance of the menstrual cycle, and the need to ask about menstrual function. Current residents in both pediatrics and obstetrics & gynecology have an advantage in learning about menstruation and puberty, as these topics are addressed in the update of the PAG Short Curriculum published recently in JPAG.⁸ Ideally, residency programs around the country (and the world) will adopt this standardized curriculum. The short curriculum addresses multiple issues, including adolescent confidentiality and a focus on puberty and menstruation. In order to be able to sort out abnormal pubertal development or abnormal menstrual bleeding, it is essential to first know what is normal. Studies have shown that the formal PAG curriculum improves resident knowledge, including a study published in this issue of JPAG.^{9,10}

Let's make menstruation a topic that can be talked about, not a taboo topic that girls are ashamed to address with anyone, even a medical professional. Puberty, menarche,

and the menstrual cycle reflect overall health. Problems in any of these areas need to be addressed to allow girls and young women across the globe to fully participate in education, physical activity, and sports, and ultimately contribute their intellect and talent to our futures together.

Paula J. Adams Hillard, MD,
Editor-in-Chief

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