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Unsuspected Consequences of the Adolescent Overweight Epidemic

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We read with great interest the article entitled “Weight Status in Young Girls and the Onset of Puberty,” which was published in the March issue of *Pediatrics*.¹ The authors showed, from longitudinal follow-up of 354 girls, that a higher BMI z score at 36 months of age and a higher rate of change of BMI between 36 months of age and first grade were associated with earlier puberty. They concluded that increasing rates of obesity in the United States may result in an earlier average age of onset of puberty and in a number of adverse outcomes, in particular reproductive cancers.

That early menarche is predictive of elevated breast carcinoma risk is well known.² More unexpected and, indeed, paradoxical are the results of a number of studies, including our prospective cohort study (the E3N cohort) of 98 995 French women (mainly teachers, aged 40–65 years at recruitment in 1990–1991) who were followed, on average, for 12 years.³ We showed that, indeed, women who had breast cancer had significantly earlier menarche than controls; however, when adjusting for age at menarche, significant trends of decreasing risk with increasing body silhouettes at age 8 and at menarche were observed (*P* trend: <.001 to <.0005, respectively, with relative risks of 0.86 [95% confidence interval: 0.75–0.99] and 0.89 [95% confidence interval: 0.80–0.99]) for women who were overweight (ie, who reported a silhouette equal or greater than the fifth silhouette according to the drawings of Sørensen et al⁴) at age 8 and at menarche, respectively. We observed no clear effect modification according to menopausal status, age at menarche, delay between age at menarche and regular cycling, regularity of cycles in adult life, or BMI at baseline. Our results suggest that overweight during childhood or adolescence reduces breast cancer risk and that this reduction is not fully explained by menstrual characteristics after menarche or by adult BMI but, rather, by hormonal mechanisms in the peripubertal period, when mammary tissue develops.

Several contradictory explanations may be put forward. According to Stoll,⁵ excess adiposity around menarche can alter the production of ovarian hormones and increase the frequency of anovulatory cycles, notably through insulin pathways, which lead to a decrease in the promotion of mammary carcinogenesis. However, others have shown that the leanest body silhouette at age 10 was associated with both higher peak growth velocities during adolescence and elevated breast carcinoma risk.⁶ Baer et al⁷ concluded that rapid adolescent growth may increase breast cancer risk by increasing levels of growth hormones and epithelial proliferation in the breast or by decreasing the amount of time for repair of DNA damage. Finally, alternative explanations have been proposed. Obesity in preadolescent and adolescent girls is associated with higher basal insulin levels, hyperandrogenia, decreased plasma levels of sex hormone-binding globulin, and, consequently, increased levels of unbound testosterone and estradiol.⁷ Higher prepubertal estrogenic exposures might paradoxically reduce breast cancer risk through differentiation of terminal end buds, mammary gland structures that are known to be the sites for malignant transformation.⁸ Additional research is required, therefore, to fully assess the consequences of the adolescent overweight epidemic.

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