Birth weight, socioeconomic class, and adult adiposity among African Americans¹,²

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In a study published in this issue of the Journal, Stettler et al (1) examined risk factors present at birth for increased adult adiposity in a cohort of African American subjects. Although female sex, first-born status, and increased maternal prepregnancy body mass index (BMI) were associated with significantly increased adult adiposity, together these factors accounted for <12% of the variance in adult adiposity. As the authors correctly pointed out, nonmodifiable risk factors such as sex and birth order can be used to identify persons at high risk, whereas modifiable risk factors such as maternal prepregnancy BMI offer appropriate targets for interventions.

An interesting question raised by this study is the effect of birth weight on the subsequent risk of obesity. After adjustment for sex, birth order, and maternal prepregnancy BMI, there was no significant association of birth weight for gestational age (expressed as a z score based on a sex- and race-specific reference population) and socioeconomic variables with obesity. In a bivariate analysis, the eventual adult BMIs of infants with birth weights < 2500 g were lower than the eventual adult BMIs of infants with birth weights > 2500 g, but the difference was not significant (22.2 and 23.5, respectively; N Stettler, personal communication, 2000). Other researchers showed that increased birth weight may be reliably associated with an increased risk of adult obesity (2). One possible explanation for the lack of an association of birth weight and subsequent adiposity in the study by Stettler et al is the relatively narrow range of birth weights among the members of that cohort and the consequent low power of the study to detect significant differences (1). Typically, most of the studies that examined the effects of birth weight on subsequent adiposity examined the effects of either low birth weight (< 2500 g) or high birth weight (> 4000 g). In Stettler et al’s cohort, 44 subjects (10%) had birth weights < 2500 g but only 8 subjects (2%) had birth weights > 4000 g (N Stettler, personal communication, 2000).

The increased frequency of low-birth-weight infants in the current study highlights concerns about the subsequent development of syndrome X in later life (3). Whether the increased risk of syndrome X is associated with an increased risk of obesity among low-birth-weight infants is less certain. However, the risk of syndrome X in low-birth-weight infants may be greater in those who become overweight adults than in those whose BMIs remain in the healthy range (4). More recently, Finnish data suggested that male infants with a low ponderal index at birth and whose BMIs were in the upper quartile by age 11 y had an increased risk of death from coronary artery disease as adults (5), but no significant relation was observed for women (6). The increased frequency of obesity in adult African Americans suggests that low-birth-weight African Americans who become obese adults may be disproportionally represented in adults with syndrome X. According to the 1997 National Vital Statistics Reports, ≈ 13% of all African American infants had birth weights < 2500 g, but low-birth-weight African Americans accounted for only 2.7% of all births (7). Therefore, although low-birth-weight African Americans who become obese may constitute a small proportion of the cases of syndrome X in adulthood, this group may account for a disproportionate share of syndrome X in African Americans.

Stettler et al also found no association between socioeconomic class and obesity. In North American and European white women, any significant associations that were found were usually inverse; for example, wealthier women are usually thinner (8). However, relations between social class in African American and Hispanic young adults differ considerably and may depend on the measure used to assess social class. When poverty status was used to examine social class relations, it was associated with an increased prevalence of obesity among young Hispanic women only. Neither poverty nor parental education was related to obesity in white, African American, and Hispanic men (9). In contrast, there were inverse relations between education and the prevalence of obesity in white and Hispanic women, but no trend was apparent in African American women.

The key to obesity prevention rests with identification of modifiable risk factors. As Stettler et al pointed out, female sex, first-born status, and increased maternal BMI accounted for <12% of the variance in adult obesity. Aside from family patterns of fatness, which are in part genetic (10), and television viewing in children and adolescents (11), there are few targets for prevention. Given how little we know, intensive comparative studies of diet and physical activity directed at high-risk populations are essential to identify the behaviors on which we should focus our preventive efforts.

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