

## Maternal & Infant Nutrition Briefs

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*A research-based newsletter prepared by the University of California for professionals interested in maternal and infant nutrition*



### **Breast-feeding Patterns and Postpartum Weight Change**

Since obesity in women increases risk of cardiovascular disease, diabetes, breast cancer, gall bladder disease, and osteoarthritis, identifying factors that affect weight retention after pregnancy is important. Past studies looking at the effects of breast-feeding on postpartum weight change are inconclusive. Inconsistent results across studies may be due to differences in the populations studied, definitions of breast-feeding, or duration of breast-feeding. If the effect of breast-feeding on postpartum weight change is truly very small, cross-sectional comparisons might not be powerful enough to pick up the differences among breast-feeding and non-breast-feeding women. The objectives of a recent study were to describe the patterns of postpartum weight change over time among a cohort of breast-feeding and non-breast-feeding women and to identify factors influencing those patterns.

Recruited in their third trimesters, the subjects were primarily college-educated, white, middle-class women who intended to breast-feed either for at least 6 months or not at all (n=110). Measurements of weight were recorded at 2 weeks and 2, 4, 6, 12, and 18 months postpartum. At each visit, the staff interviewed the women about their infant feeding practices, the mother's diet during the previous 6 months using a food frequency questionnaire, physical activity, and reproductive history. A woman was defined as "fully breast-feeding" if breast milk provided at least two-thirds of her infant's energy needs, based on the infant's weight. The main outcome was postpartum weight retention, calculated by subtracting the weight before pregnancy from the woman's weight at each postpartum visit.

The average weight dropped from 67.2 kg to 62.4 kg over the entire 18 months. Patterns of weight change varied considerably: 36% of the women had a continual drop in weight; 24% had an initial drop followed by a plateau; 25% had an initial drop followed by a slight increase in weight by 12 or 18 months; and 6% had a substantial increase in weight over time. Physical activity was lowest at the 2 week postpartum visit. However, after that point, activity

levels did not vary over the 18 months. On the average, about 32% of the mother's energy intake was from fat, with no significant variation at 6, 12, and 18 months. Women who bottle-fed their babies retained more weight over time than women who breast-fed ( $p < 0.05$ ). Even women who breast-fed for less than 4 months retained less weight than non-breast-feeding women. Women who switched to partial breast-feeding had weight retention rates between those of fully breast-feeding and non-breast-feeding women. Other factors affecting weight change were weight gained during pregnancy, mother's age, and marital status. About 45% of the women gained more weight prenatally than recommended by the Institute of Medicine. Women who gained more weight than recommended retained more weight afterwards (about 0.65 kg retained per kg of weight gain). Older women were less likely than younger women to return to their pre-pregnancy weights. Finally, unlike married women, single mothers had a pattern of weight gain rather than weight loss.

Although breast-feeding women had greater rates of weight loss than non-breast-feeding women, the effects of breast-feeding were small. Only by following the same women over time were the researchers able to observe these differences. Unfortunately, the methods used to assess diet were relatively crude and did not give a picture of energy intakes at intervals less than 6 months. More research is needed among women from different racial, ethnic, and socioeconomic backgrounds.

**Source:** Janney, C. A., D. Zhang, and MF Sowers. 1997. Lactation and weight retention. *Am J Clin Nutr* 66: 1116-24.

### **Genetics and the Birth Weight Gap between Whites and African Americans**

Poverty, smoking, inadequate prenatal care, very young or old maternal age, and black race are all well-documented risk factors for low birth weight. Although rates of low birth weight decrease as the number of risk factors goes down, improvement occurs more rapidly among whites than African Americans. The persistence of a gap in birth weights has led some researchers to speculate that the effect of race on birth weight is genetic. While researchers have examined birth outcomes among first- and second-generation women from other minority groups, no study has ever compared birth outcomes of West African-born women delivering in the U.S. to those of U.S.-born whites and African Americans. If the link between birth weight and race is explained by genes rather than social factors, women of "pure" West African origin would be expected to bear the smallest babies. This trend would be seen, because U.S.-born African Americans derive about three quarters of their heritage from West African ancestors and the rest from Europeans.

A recent article *did not find* that African-born women have the smallest babies, discrediting the notion that genetics explains the gap in birth weight. Using birth certificate data, the researchers analyzed birth weights among 44,046 whites, 43,322 U.S.-born blacks, and 3,135 African-born blacks delivering babies in the U.S. between 1980-95. Mean birth weights among whites, U.S.-born blacks, and African-born blacks were 3446, 3089, and 3333 gm., respectively. The incidence of low birth weight among whites, U.S.-born blacks, and African-born blacks was 4.3%, 13.2%, and 7.1%, respectively. Differences in risk factors were observed among the three groups, with U.S.-born African Americans being the youngest, least likely to be married, the least educated, and the most likely to have inadequate prenatal care. African-born women had more pregnancies, as well as more previous fetal and neonatal losses than the other women. When the researchers accounted for these differences, they still found a lower rate of low birth weight among African-born blacks compared to U.S.-born blacks (6.9% vs. 8.5%). In examining a subgroup of low-risk women from all groups, differences between whites and African-born blacks narrowed even further but persisted

among U.S.-born blacks.

The study has some important limitations, particularly related to the lack of other data, (i.e., smoking habits and prenatal weight gain) that could explain some of the findings. Moreover, the number of African-born women was too small to get a reliable estimate of very low birth weights. Nevertheless, these findings support the idea that social factors, such as exposure to poverty or racial discrimination, rather than genetic factors account for the persistent gap in birth weight between white and African American babies.

**Source:** David, R. J., and J. W. Collins. 1997. Differing birth weight among infants of U.S.-born blacks, African-born blacks, and U.S.-born whites. *N. Eng. J. of Med.* 337:1209-14.

### **American Academy of Pediatrics: Recommendations on Soy Formulas**

By two months of age, most babies in the U.S. are formula-fed, despite recommendations that breast-feeding is best. Since use of isolated soy-protein based formulas has doubled in the past ten years, the American Academy of Pediatrics (AAP) has updated its 1983 statement on their appropriate use of these formulas. In its current statement, the AAP reviews recent research on the composition of isolated soy-protein based formulas; growth and development in term and pre-term infants fed soy protein-based formulas; use in disorders of carbohydrate metabolism, diarrhea, and colic; and antigenicity and allergenicity. Based on this review, the Committee on Nutrition makes the following nine statements:

- 1) Where nutritional needs of *term* infants are not met by breast milk or cow's milk-based formulas, soy protein-based formulas are safe and effective alternatives to support normal growth and development. Soy protein-based formulas have no advantage over cow's milk-based formulas as a supplement for breast-fed infants;
- 2) Soy protein-based formulas are appropriate for infants with galactosemia and hereditary lactase deficiency;
- 3) Parents seeking a vegetarian diet can be advised to use soy protein-based formulas;
- 4) Most infants with acute gastroenteritis or diarrhea can be given breast milk or cow's milk-based formulas after rehydration. If lactose intolerance is documented, soy protein-based formulas are indicated;
- 5) Routine use of soy protein-based formulas has no proven value in preventing or managing infant colic;
- 6) Routine use of soy protein-based formulas has no proven value in preventing allergy in healthy or high-risk infants;
- 7) Infants with damage to the small bowel due to cow's milk protein should not be routinely given soy protein-based formulas. Instead, they should be fed with hydrolyzed protein or synthetic amino acid formulas;
- 8) Most infants with documented immunoglobulin E (Ig-E) mediated allergies due to cow's milk can do well on soy-protein based formulas; and
- 9) Soy-protein based formula is not appropriate for preterm infants who weigh less than 1800

g.

**Source:** American Academy of Pediatrics, Committee on Nutrition. 1998. Soy protein-based formulas: recommendations for use in infant feeding. *Pediatrics*. 101:148-153

### **Overweight on the Rise among Low-Income Preschoolers**

In the past 30 years, the prevalence of overweight among U.S. school-age children (6-11 years) has increased by 7-9 percentage points. However, a comparison of data from the National Health and Nutrition Examination Surveys (NHANES) from 1971-74 and 1988-94 did not find changes in the prevalence of overweight among preschoolers. The purpose of this report was to determine whether the prevalence of overweight and obesity has changed in the past decade among *low-income* preschoolers, toddlers, and infants.

The Centers for Disease Control and Prevention (CDC) routinely monitors growth among low-income children participating in publicly funded nutrition and health programs. Weight and height or length are measured in the clinics and transferred to the CDC database. From 1983-95, 18 states, including Alabama, Arizona, Colorado, Connecticut, Florida, Iowa, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Nebraska, New Jersey, New Mexico, Oregon, Utah, and Vermont, consistently contributed to CDC's Pediatric Nutrition Surveillance System (PedNss). Since most of the data came from the Women, Infant and Child (WIC) Nutrition Program, the researchers surveyed the states to find out if overweight certification criteria or priority ranking had changed over the 13 years. In one state, the criterion had changed but elimination of this state from the analysis did not affect the results.

Based on the National Center for Health Statistics reference growth charts, overweight and obesity were defined as weight-for-height above the 85<sup>th</sup> and 95<sup>th</sup> percentiles, respectively. The CDC found that the prevalence of overweight in children aged 0-59 months increased significantly from 18.6% in 1983 to 21.6% in 1995 ( $p < 0.05$ ). The prevalence of obesity also increased from 8.5% in 1983 to 10.2% in 1995 ( $p < 0.05$ ). For each year of age, increases in the prevalence of overweight and obesity were observed, with the greatest changes occurring in 4-5 year olds. The prevalence of overweight among preschoolers was highest among Hispanic children (0-23 mo.: 28.7% and 24-59 mos. : 23.3%) . However, among children less than two years, non-Hispanic white children had the largest jump in prevalence of overweight (15% relative increase for whites, 8.9% for African Americans, 11.7% for Hispanics). For children over two years, African American children had the greatest relative increase in the prevalence of overweight (21.9% for whites, 29.9% for African Americans, and 10.4% for Hispanics). The increases in the prevalence of overweight appear to be due to a general upward shift in weight across the entire population, rather than changes in a particular subgroup of children

**Source:** Mei, Z., K.S. Scanlon, L.M. Grummer-Strawn, D.S. Freedman, R. Yip and F. L. Trowbridge. 1998. Increasing prevalence of overweight among US low-income preschool children: the Centers for Disease Control and Prevention Pediatric Nutrition Surveillance, 1983 to 1995. *Pediatrics* 101 (No. 1 January), p. e12 (<http://www.pediatrics.org>)

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