

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



Effect of WIC Services on Postpartum Women

Iron deficiency is of concern among low-income women and can threaten maternal health as well as pregnancy outcomes. Although many women are in compromised nutritional status after pregnancy, most health services focus on the health of the baby and not the mother. Unlike other programs, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) works to alleviate nutritional problems by distributing nutritious supplemental food and nutrition education to women during pregnancy and in the postpartum period. The purpose of this study was to examine the effect of WIC participation on iron status of nonlactating, postpartum women.

In Maryland, the researchers enrolled nonlactating WIC participants (n=57) and WIC-eligible nonparticipants (n=53) and followed them over the course of six months postpartum. Finger stick blood samples were collected at 0.5, 2, 4, and 6 months postpartum to measure plasma ferritin, transferrin receptor, and hemoglobin, all indicators of iron status. Women who participated in WIC for at least 6 months postpartum were less likely to be anemic than nonparticipants. Using hemoglobin as an indicator of anemia (<7.45 mmol/L), over 50% of the nonparticipants and only 17% of the participants were judged to be anemic. The incidence of anemia in the participating group decreased over time suggesting that with continuing participation, maternal nutritional status improves.

Supplement use was greater in the participants than in nonparticipants, which might explain some of the differences in hemoglobin values. However, no differences between the groups were found for any of the other indicators of iron status. In addition, because no data were collected on rates of infection, inflammation, and genetic diseases (i.e., sickle cell anemia), the difference in anemia rates cannot definitively be linked to improvement of iron status. Furthermore, although all subjects were "low-risk" nonlactating, postpartum women, the authors did not fully address the effects on anemia rates of baseline differences that

determined whether women received WIC or not.

The benefits of WIC for pregnant women have been well documented, but less evidence is available to determine the cost-benefits of serving other categories of WIC participants. The study described above suggests that WIC reduces prevalence of anemia in postpartum nonlactating women, but more rigorously designed studies are needed to determine whether or how WIC influences postpartum iron status.

Source: Pehrsson PR, Moser-Veillon PB, Sims LS, Sutor CW, Russek-Cohen E. Postpartum iron status in nonlactating participants and nonparticipants in the Special Supplemental Nutrition Program for Women, Infants, and Children. *Am J Clin Nutr* 2001; 73: 86-92.

Introducing Solids: Effect of Timing on Mother and Baby

The World Health Organization (WHO) recommends that complementary food be introduced between 4 and 6 months of age, whereas the American Academy of Pediatrics (AAP) suggests "around 6 months". Recommendations are largely based on infant intake, growth, and morbidity, with less consideration of other outcomes. Only two randomized studies, both conducted in Honduras, have examined the effects of introducing complementary foods at 4 months or 6 months of age on maternal and infant outcomes. A recent article, based on these two studies, examines the effects of the timing of complementary foods on infant motor development, lactational amenorrhea, and maternal nutritional status.

Each study randomly assigned nursing mothers and their infants to either: a) exclusive breastfeeding until 6 months or b) breastfeeding with solid food introduced at 4 months. To ensure nutritional quality and food safety, the researchers provided the solid foods used in the study. The first study enrolled term infants weighing greater than 2000 grams (n=141), and the second study enrolled term low birth weight infants weighing 1500 - 2500 grams (n=119). The research assistants made weekly home visits from 4 to 6 months and monthly visits thereafter until 12 months postpartum to record developmental milestones, mothers' return of menses, and maternal anthropometric data.

Infants exclusively breastfed until 6 months were able to crawl, and in the first study, walk sooner than infants who started solids at 4 months. The average age in reaching other developmental milestones was similar. In the second study, the average duration of amenorrhea was significantly longer in exclusively breastfeeding mothers compared to the early solids group. In the first study, mothers breastfeeding exclusively lost more weight during the intervention than mothers in the other group. One might question whether increased weight loss is a good thing in these mothers, since weight loss in undernourished populations may result in maternal nutrient depletion. However, only 10% of the mothers were underweight. In addition, the estimated nutritional burden of exclusive breastfeeding for 2 more months was low: 2% of body stores for vitamin A, 0.2% for calcium, and 0.7% for iron.

The overall conclusions are that exclusive breastfeeding until 6 months, compared to only 4 months, results in increased maternal weight loss, longer duration of amenorrhea, and earlier achievement of certain motor skills in the infants. Although some tradeoffs between maternal and infant needs may exist, in most populations the advantages of exclusive breastfeeding for the additional 2 months probably outweigh the disadvantages. In developing countries where concerns about the mother's nutritional state exist, supplements provided to the

mother may be the preferred option over earlier weaning.

Source: Dewey KG, Cohen RJ, Brown KH, Rivera LL. Effects of exclusive breastfeeding for four versus six months on maternal nutritional status and infant motor development: results of two randomized trials in Honduras. *J Nutr.* 2001; 131: 262-267.

An Update on Juice in Young Children

The research is conflicting as to whether excessive juice intake (> 12 oz a day) contributes to stunting and overweight in young children. However, previous studies involved cross-sectional designs and therefore, could not test a cause-effect relationship. The purpose of this longitudinal study was to examine the relationship between intake of juice and child growth at 72 months of age.

The sample included 72 white, middle-class children, followed from 24 through 72 months of age. At 7 interviews over this period, registered dietitians collected 3 days of dietary intake data (a 24-hour recall and 2 food records) and weighed and measured the children. Only 100% juice was categorized as juice. Beverages containing less than 100% juice were categorized as "other drinks".

Over time, intake of juice and milk decreased significantly, while intake of sodas and other drinks increased. Some evidence was found that children who had high intakes of juice at 24 months also had relatively high intakes of other drinks, but not juice, at 72 months. The researchers did not find any relationship between juice intake over time and height, weight, or body mass index at 72 months. However, only 3 children continued to drink > 12 oz of juice daily during the observation period, and relatively few children in the study were stunted (n=3) or overweight (n=5) at 72 months. In effect, the researchers were unable to determine whether high intakes of juice increased the risk of being overweight (body mass index > 9th percentile) in this study.

The authors conclude that 100% juice intake is not related to stunting or overweight in young children. Although the longitudinal design was appropriate for studying effects of juice on child growth, similar studies should be carried out in other populations at greater risk of excessive juice intake and overweight. The implications of early excessive juice intake on consumption of other sweetened beverages in late childhood and adolescence also need to be examined more closely.

Source: Skinner JD, Carruth BR. A longitudinal study of children's juice intake and growth: the juice controversy revisited. *J Am. Diet. Assoc.* 2001; 101: 432-437.

Guidelines for Managing Diabetes during Pregnancy

Gestational diabetes mellitus has been defined as glucose intolerance that has its onset or is first recognized during pregnancy. Gestational diabetes occurs in about 7% of all pregnancies. The January, 2001 issue of *Diabetes Care* summarizes considerations and strategies for managing gestational diabetes during pregnancy, as well as preconceptional care for women who enter pregnancy with diabetes.

For those women with pre-existing diabetes, achieving good blood glucose control before conception is important. To reduce the risks to mother and infant, maintaining levels of hemoglobin A1c less than 1% above the normal range are desirable. Reducing the risks of

congenital defects by achieving tighter control must be balanced against the risk of hypoglycemia in the mother. Insulin should be prescribed for type 1 or type 2 diabetes, because the safety of oral glucose-lowering agents in early pregnancy has not been established.

In addition to their usual prenatal care, pregnant women with either pre-existing or gestational diabetes should continue to monitor their diet and blood glucose levels and meet with a registered dietitian to receive an individualized diet plan. Noncaloric sweeteners may be used in moderation. In obese women (body mass index above 30), caloric restriction (25 kcal/kg body weight) and restriction of carbohydrate to 35 to 40% of calories is recommended. Women without medical or obstetrical complications may start or continue a program of moderate exercise as part of their treatment plan. Gestational diabetes can often be controlled through medical nutrition therapy and moderate exercise, but insulin is recommended in women who do not improve glycemic control through lifestyle changes alone. Human insulin should be used, as insulin analogs need further research. Oral glucose-lowering agents are generally not recommended as further testing in late pregnancy of these medications is also needed. Breast-feeding should be recommended.

Women with gestational diabetes need follow-up at least 6 weeks postpartum to determine if their glucose levels have returned to the normal range. In particular, women who have impaired glucose tolerance in the postpartum period should be targeted for intensive medical nutrition therapy and exercise programs, because these women are at very high risk for development of diabetes later in life.

Source: American Diabetes Association. Gestational Diabetes Mellitus. *Diabetes Care* 2001; 24 (1): S77-S79
American Diabetes Association. Preconception Care of Women with Diabetes. *Diabetes Care* 2001; 24 (1): S66-S68

Maternal and Infant Nutrition Briefs is a research-based newsletter prepared by Dr. Lucia Kaiser (llkaiser@ucdavis.edu), a Cooperative Extension Specialist in the Department of Nutrition, University of California at Davis. This newsletter is written for health professionals interested in nutrition of mothers and young children.

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