

Maternal & Infant Nutrition Briefs



September/October 2002

ADA Position Paper on Nutrition and Lifestyle during Pregnancy

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



ADA Position Paper on Nutrition and Lifestyle during Pregnancy

In October, the American Dietetic Association published a new position paper on nutrition and lifestyle for a healthy pregnancy outcome. Dietitians and other health professionals will find a range of useful topics including guidance on weight gain; Food Guide Pyramid servings; vitamin and mineral supplements; exercise; herbal/botanical supplements; food additives; alcohol, tobacco, and illegal substances; caffeine; common complaints of pregnancy; food cravings and pica; diabetes; pregnancy-induced hypertension; HIV/AIDS; food-borne illness; encouragement to breastfeed; and referrals. Key points discussed in the position paper include the following:

- **Appropriate weight gain:** Prenatal weight gain within the Institute of Medicine (IOM) recommended ranges is associated with better pregnancy outcomes. Although African American women are at greater risk of delivering a low birth weight infant, the evidence does not support a recommendation for them to gain in the upper half of the IOM guidelines. Pre-pregnancy body mass index, rate of weight gain, maternal age, and physiological appetite must be considered in tailoring energy recommendations to the individual. The risk of maternal overweight due to excessive pregnancy weight gain needs to be balanced against the risk of poor fetal growth associated with low weight gain. This issue is especially problematic in teenagers. Instead of advising growing pregnant teens to limit excessive weight gains, health providers should focus efforts on helping teens return to normal weight after delivery and preventing subsequent teenage pregnancies.
- **Consumption of a variety of foods:** Women should consume a variety of foods according to the Food Guide Pyramid, with cultural food practices considered, to meet energy and nutrient needs and gain recommended amounts of weight. As a starting point, recommended servings per day include: 9 from the bread, cereal, rice, and pasta group; 4 from the vegetable group; 3 from the fruit group; 2-3 from the milk, yogurt, and cheese group; and 2 (or 6 oz.) from the meat, poultry, fish,

dry beans, eggs, and nuts group. Pregnant teens may need an additional serving from the milk group.

- Timely and appropriate supplementation of vitamins and minerals: The consumption of more food to meet energy needs and the increased absorption and efficiency of nutrient utilization that occurs in pregnancy are generally adequate to meet the needs for most nutrients. To prevent neural tube defects, women of childbearing years and pregnant women should consume 400 mg per day of synthetic folic acid from fortified foods (cereals and other grains), supplements or both, in addition to consuming folate from foods in a varied diet. A routine low-dose iron supplement (30 mg/day) is recommended for all pregnant women, beginning at the first prenatal visit. For women who do not consume milk products or calcium-fortified foods, a calcium and vitamin D supplement may be needed. In general, pregnant women should be careful in choosing a supplement that does not exceed the tolerable upper limits for a particular vitamin or mineral.

- Avoidance of alcohol, tobacco, and other potentially harmful substances: Since a safe level of alcohol intake has not been established, women who are or may become pregnant should not drink alcoholic beverages at all. It is also important that marijuana, cocaine, and other illegal drugs be avoided during pregnancy. Because pregnant woman may be reluctant to admit current use of illegal substances, a history of substance abuse in the woman and possibly her partner could indicate a need for further assessment and follow-up. Since smoking can limit fetal growth even among women who quit smoking early during their pregnancies, advice and support related to smoking cessation should target women before conception. Regarding caffeine, prudent advice would be to discourage caffeine intakes above 300 mg/day. Pregnant women should also be advised to consider herbal treatments as suspect until their safety during pregnancy can be ascertained.

- Safe food handling: Pregnant women are at high-risk for food-borne illness. Among the most common causes of diarrhea during pregnancy are several food- or water-borne pathogens (bacteria, protozoa, or viruses), including *Salmonella* species, *Helicobacter pylori*, *Shigella*, *Escherichia coli* (*E. coli* O157:H7), and *Cryptosporidium*. In accordance with the Dietary Guidelines, pregnant women should not consume unpasteurized juices, raw sprouts, or raw (unpasteurized) milk products. Pregnant women should also avoid raw or undercooked meat, poultry, eggs, fish, or shellfish. To reduce the risk of listeriosis, pregnant women should cook leftovers and ready-to-eat foods (e.g., hot dogs) until steaming hot and avoid soft Mexican cheeses; homemade cheese or cheese purchased from street vendors; and other soft cheeses, such as Brie, feta, blue, and Camembert. Pregnant women should also avoid consuming large fish, including shark, swordfish, King mackerel, and tilefish. These fish may accumulate unsafe levels of methylmercury.

Finally, pregnant women with inappropriate weight gain, hyperemesis, poor dietary patterns (i.e. those who avoid one or more food groups), phenylketonuria (PKU), certain chronic health problems, or a history of substance abuse should be referred to a qualified dietetics professional for medical nutrition therapy.

Source: Position of the American Dietetic Association: Nutrition and lifestyle for a healthy pregnancy outcome. *J Am Diet Assoc* 2002; 102 (10): 1479-1490.

Is Calcium Protective in Women with Low Exposure to Lead?

Lead is a toxic element that can accumulate in bone over the course of a lifetime. When bone

remodeling occurs during pregnancy and lactation, stored lead may be released into the mother's blood stream. A study reviewed in the July issue of this newsletter reported an association between higher lead levels in maternal bone and lower infant mental development scores (Pediatrics 2002; 110: 110-118). In addition to its neurological effects, lead toxicity can cause anemia by inhibiting enzymes involved in hemoglobin synthesis. Calcium supplementation may be a useful strategy to reduce the rate of bone turnover in pregnant or lactating women, thus protecting the infant from exposure to lead. The purpose of this study was to examine the effect of calcium supplements on changes in maternal blood lead levels from late pregnancy to the early postpartum period.

The study was carried out in Brazil among 47 healthy, lactating women with low dietary intakes of calcium and low-level exposure to lead. The women, followed from week 2 to week 7 after delivery, were randomly assigned to a calcium-supplemented group (500 mg per day) or a nonsupplemented group (control). One of the enzymes inhibited by lead is delta aminolevulinic acid dehydratase enzyme (d-ALAD). Thus, a sensitive indicator of low-level lead exposure is the degree to which zinc can replace lead in a test tube and restore enzyme activity (Zn-d-ALAD% reactivation). A high value for Zn-d-ALAD% reactivation suggests greater exposure to lead. The researchers also measured hematocrit and red blood cell lead levels (PbRBC) of the mothers and their usual dietary calcium intakes by 24-hour dietary recalls.

There were no differences among the groups in age, body mass index, and usual intake of calcium, zinc, and iron at the start of the study. Usual intake of calcium was only 60% of the adequate intake for pregnant women. After receiving the calcium supplements for six weeks, the treatment group had a higher mean hematocrit than controls ($p < 0.05$). Zn-d-ALAD% reactivation and PbRBC increased significantly in control women but did not change in the calcium-supplemented group ($p < 0.001$). The beneficial effects of calcium were particularly noticeable in multiparous women.

This study provides some direct evidence that calcium supplements, given to nursing mothers with marginal calcium intakes, may be useful in minimizing a rise in maternal blood levels of lead. The study suffers from a few design limitations (small sample size, not double-blind, no placebo) and should be repeated to confirm the results. In the meantime, there would appear to be little reason not to encourage nursing mothers with diets low in calcium to improve their intakes, thus possibly lowering the risk of exposure to lead in their infants.

Source: Pires JB, Miekeley N, Donangelo CM. Calcium supplementation during lactation blunts erythrocyte lead levels and d-aminolevulinic acid dehydratase zinc-reactivation in women non-exposed to lead and with marginal calcium intakes. Toxicology 2002; 175: 245-255.

Safety Issues Related to Powdered Infant Formula

Enterobacter sakazakii is a rare but often fatal pathogen that recently made headlines when it was linked to the death of an infant in a neonatal intensive care nursery in Tennessee. In addition to the one death from meningitis, nine other infants were either infected or colonized by the bacteria. The source was ultimately traced to the use of powdered Portagen infant formula and resulted in recall of the product. In addition to meningitis, Enterobacter sakazakii can result in sepsis and necrotizing enterocolitis. Although a pasteurized liquid is used to prepare powdered formula, contamination may occur in the final steps of production. Thus, sterile techniques used to reconstitute powdered formula in a hospital do not ensure safety of the product. Indeed, in the instance of this report, hospital staff had followed all guidelines to

the letter.

The Centers for Disease Control and Prevention (CDC) included five interim recommendations for neonatal intensive care in a report following investigation of this case. First, use alternatives to powdered formula wherever possible. Second, use aseptic techniques to prepare formula. Third, refrigerate prepared formula immediately and discard it after 24 hours. Fourth, limit "hang" time (i.e., amount of time the contents of the formula bag are fed to the baby) to 4 hours or less. Fifth, have written guidelines on how to deal with a manufacturer's recall. An additional recommendation from the Food and Drug Administration (FDA), but not the CDC, is to use boiling water to reconstitute the formula. However, there are number of reasons why that final point might not be advisable. Adding boiling water does not necessarily kill the pathogen, but it certainly can alter the other formula ingredients including some vitamins and proteins. Boiling water can also cause the formula to clump.

The CDC recommendations regarding use of powdered formula pertain to intensive neonatal care nurseries. Premature, low birth weight, and/or immune-compromised infants are considered at most risk. However, with early discharge of some premature infants, a significant number of these babies are cared for at home. Thus, public health nutritionists should continue to educate parents and other caregivers on appropriate choice and safe handling of infant formula in a community setting.

Sources:

Baker RB. Infant formula safety. *Pediatrics* 2002; 110: 833-835

Enterobacter sakazakii infections associated with the use of powdered infant formula-Tennessee, 2001. *MMWR* 2002; 51:297-29

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