USANA Technical Bulletin

Pregnancy

Description

- Pregnancy is one of the most nutritionally demanding times in a woman's life. Nutritional requirements are higher during pregnancy to support the rapid growth and development of the fetus and replace the depleted nutritional reserves of the mother.
- Proper prenatal care coordinated by a physician is advisable in promoting optimal health and well being of the developing infant and mother.

Nutritional Influences

- A diet consisting of nutrient rich foods coupled with proper supplementation can help guard against dietary deficiencies during pregnancy. More calories, protein, vitamins and minerals are needed to support the nutritional demands of both mother and baby.
- Folate (folic acid) plays a crucial role in the development of the central nervous system during the early weeks of fetal development. Low folate increases the risk of neural tube defects.[1] Many physicians now recommend that women take 1000 mg of folate per day, starting three months before conception.
- Iron needs increase due to a higher blood volume and the demands of the fetus and placenta. Iron requirements vary between individuals; it is recommended that pregnant women receive an individual assessment of their iron status, nutritional guidance, prenatal care, and iron supplementation as needed from their physicians, to decrease the risk of poor pregnancy outcome.[23]
- Iodine is an essential mineral needed for proper thyroid function. During pregnancy the placenta will extract iodine from the mother; fetal levels of iodine are usually several times higher than those of the mother. A maternal iodine deficiency can cause significant irreversible mental retardation in the fetus.[4,5]
- Low maternal zinc levels have been associated with low infant birthweight.[6]
- Newborns from a selenium deficient mother can suffer from muscular weakness. [7]
- During pregnancy, women need additional protein to support tissue growth in the fetus, placenta and maternal tissues.[5]
- Vitamin D is needed for fetal growth, bone ossification, tooth enamel formation and neonatal calcium homeostasis.[8]
- The mother's diet should contain extra calcium from the beginning of pregnancy until the end of lactation. Early accumulation of calcium provides a reserve for later use when it becomes difficult to consume enough to meet the needs of mother and baby.[5] Numerous studies have

shown that calcium supplementation can reduce the incidence of pregnancy induced hypertension.[9]

- Magnesium levels decrease during pregnancy; there is also evidence that magnesium levels are further decreased in women who later develop pre-eclampsia.[10] Oral magnesium supplementation is therapeutic in treating pregnancy related leg cramps.[11]
- Pyridoxine (B6) is an important coenzyme in the biosynthesis of the neurotransmitters GABA, dopamine, and serotonin. It is required for normal perinatal development of the central nervous system. Studies show that a neonatal deficiency of B6 can cause behavioral abnormalities, motor disorders and low birthweight.[12]

Abstracts

Butterworth CE Jr, Bendich A. Folic acid and the prevention of birth defects. Annu Rev Nutr 1996:16: 73-97. Thirty years ago, it was suggested that maternal intake of certain vitamins during pregnancy affected their incidence of serious fetal malformations. Subsequent research has revealed that folate (folic acid), a B vitamin, plays a crucial role in the development of the central nervous system during the early weeks of gestation, which is generally before the pregnancy is confirmed. In a significant number of embryos, an inadequate supply of folate at this time leads to a failure of the primitive neural tube to close and differentiate normally and results in neural tube birth defects (NTD). Numerous studies have confirmed the importance of an adequate intake of folate during the weeks just before and after conception. Overall, the data predict that if women consume multivitamin supplements containing folic acid during the peri-conceptional period, the number of children born with serious malformations (such as spina bifida).and anencephaly) could be reduced by half. Although programs to increase dietary folate intake of potential mothers may be effective in reducing NTD, the only proven and practical preventive measure currently available is to take oral multivitamin supplements containing folic acid. Multivitamin supplementation has also been associated with reduced incidence of other congenital malformations.Current research is focusing on the role of micronutrients in embryogenesis, and on methods to identify prospective mothers at increased risk for bearing a child with NTD or with other major malformations shown to occur at reduced frequency with multivitamin supplementation. Of equal importance is the development of methods to communicate current knowledge as a public health measure.

Purwar M, Kulkarni H, Motghare V, Dhole S. Calcium supplementation and prevention of pregnancy induced hypertension. J Obstet Gynaecol Res 1996 Oct;22(5):425-30. In a randomized controlled trial 201 healthy nulliparous women were randomly allocated by means of a computer generated randomization list. From 20 weeks of gestation until delivery they received either 2 g of oral elemental calcium (n = 103) per day or an identical placebo (n = 98). Eleven women (5.47%) were lost to follow-up after randomization. The study groups were very similar at the time of randomization; with respect to several clinical and demographic variables. Treatment compliance was very similar in both groups as was determined by pill count. The rate of pregnancy induced hypertension was lower in the calcium group than in the placebo group 8.24%; vs 29.03%; (RR = 0.28; 95% CI 0.14-0.59). The incidence of gestational hypertension was 6.18% in the calcium group and 17.20% in the placebo group (RR = 0.28; 95% CI 0.08-0.80), and the incidence of preeclampsia was 2.06% in the calcium group and 11.82% in the placebo group (RR = 0.13; 95% CI 0.01-0.64). In conclusion calcium supplementation given in pregnancy to nulliparous women reduces the incidence of pregnancy induced hypertension.

References

[1] Butterworth CE Jr., Bendich A., Folic acid and the prevention of birth defects. *Annu Rev Nutr* 16: 73-97 (1996).
[2] Long PJ., Rethinking iron supplementation during pregnancy. *J Nurse Midwifer* 1995 Jan-Feb. *Y*; 40(1): 36-40 1995.

[3] Schwartz WJ 3rd., Thurnau GR., Iron deficienct anemia in pregnancy. *Obstet Gynecol Clin* 1995 Sept; 38 (3): 443-54.
[4] DeLange F., The disorders induced by iodine deficiency. *Thyroid V* 1994 Spring; 4(1): 107-28.
[5] The Concise Encyclopedia of Foods and Nutrition.(CRC Press, Boca Raton, Florida 1995.) Pg.878.
[6] Bloxam DL, Williams NR, Waskett RJ, Stewart SG. Disturbed zinc metabolism and reduced birthweight related to raised maternal serum alpha-fetoprotein in normal human pregnancies. Acta Obstet Gynecol Scand 1994 Nov; 73(10):758-64.
[7] Bedwal RS, Bahuguna A. Zinc, copper and selenium in reproduction. Experientia 1994 Jul 15; 50(7):626-40.
[8] Specker BL., Do North American women need supplemental vitamin D during pregnancy or lactation? *Am J Clin Nutr* Feb. 1994; 59(2Suppl):484S-490S discussion 490S-491S.
[9] Purwar M., Kulkarni H., Motghare V., Dhole S., Calcium supplementation and prevention of pregnancy induced hypertension. *J Obstet Gynaecol Res* 1996 Oct; 22(5):425-30.
[10] Standley CA, Whitty JE, Mason BA, Cotton DB, Serum ionized magnesium levels in normal and preeclamptic gestation. Obstet Gynecol 1997 Jan; 89(1):24-7.
[11] Dahle LO, Berg G, Hammar M, Hurtig M, Larsson L,. The effect of oral magnesium substitution on pregnancy induced leg cramps. Am J Obstet Gynecol 1995 Jul; 173(1):175-80.
[12] Gerster H., The importance of vitamin B6 for development of the infant. Human and animal experiment studies. Z Ernahrungswiss 1996 Dec;35(4):309-17.

