CLINICAL UPDATE: Women's Health and Nutrition—Demographic Challenges

Nutritional Gaps for Women in the United States

Undernutrition of micronutrients is an ongoing concern, especially during pregnancy, despite fortification of the food supply and an abundance of calorically dense foods that contribute to obesity. Supplementation may be necessary to meet the recommended dietary allowance (RDA) of key nutrients for women.[1] The Institute of Medicine (IOM),[2] American College of Obstetricians and Gynecologists (ACOG),[3] and World Health Organization (WHO)[4] provide recommendations for micronutrient intake beginning in early pregnancy to promote optimal outcomes (**Table**).

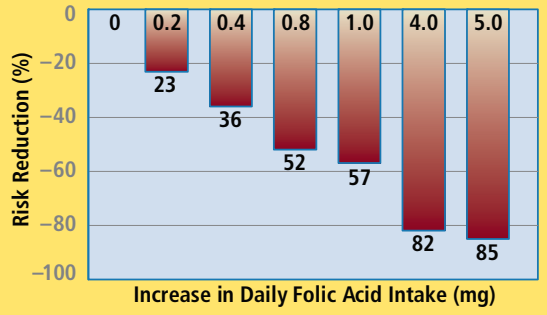
Adequate pre- or periconceptual folic acid intake (400 µg-4 mg) is important for women of reproductive age to decrease risk of neural tube defect (NTD)-affected pregnancies (**Figure**).[5,6] Despite fortification of the US food supply with ≥0.14 mg of folic acid/100 g of cereal grain, women of reproductive age are at risk for folic acid deficiency.[7] Weight-loss trends may contribute to this risk.

Obese women have a higher risk of infants with NTDs than nonobese women and are 24% less likely than normal/underweight women to take a folic acid supplement.[8] The risk of an NTD-affected pregnancy is 1.5 to 3 times higher in Hispanic than white women.[9] Hispanic women are less likely to consume foods fortified with folic acid, to be aware of how folic acid can prevent birth defects, or to take vitamins containing folic acid before pregnancy.[10]

Iron deficiency (ID) and ID anemia (IDA) are common in women and contribute to poor maternal and fetal outcomes.[11] By the third trimester, 28% of white, 48% of African American, and 30% of Hispanic women have IDA.[12] The clinical goal is to prevent ID and IDA so that a pregnancy begins with adequate maternal iron stores. Food sources alone may be insufficient for pregnant women to meet the current RDA for iron (27 mg/d). Women who received iron and folic acid supplementation before pregnancy had 33% fewer low-birth-weight babies than women who received supplements during pregnancy only.[13]

Women require adequate calcium, magnesium, and vitamins D and K intake through the lifespan to build and maintain bone density and for development of fetal skeletal structure.[14] African, Asian, Hispanic, and Native American women are more likely to be lactose intolerant than white women[15] and may require supplemental calcium and vitamin D to meet the RDA for pregnancy.[14,16]

FIGURE. Dose-Response Relationship Between Folic Acid and Reduced Incidence of NTDs[5,6]



Polyunsaturated omega-3 fatty acids, particularly docosahexaenoic acid (DHA), are required for formation of new tissues and cell membranes and are essential components of the human brain and retina.[17] Enhanced cognitive development and visual acuity have been demonstrated in babies born to women with higher DHA intake.[17] Higher levels of DHA during pregnancy have been associated with advanced attention development in infants through toddlerhood.[18,19] Increased DHA and eicosapentaenoic acid (EPA) intake in women also has been correlated with reduced morbidity from postpartum depression and reduced mortality risk from stroke and cardiovascular disease.[20]

The recommended DHA + EPA intake during pregnancy is ≥300 mg/d (**Table**), yet the estimated average DHA intake of North American adults is 80 mg/d.[21]

Role of Obstetricians and Gynecologists in Women's Health Care

Obstetricians and gynecologists (ob/gyns) can raise awareness of the importance of nutrition and the potential for nutritional inadequacies before, during, and after pregnancy. The growing minority population in the United States is at higher risk for micronutrient deficiencies for many reasons, including demographic differences and lack of access to healthy foods.[22,23]

Ob/gyns can impact nutritional awareness among families in 3 key areas: 1) Emphasize the need for all women of childbearing age to consume 400 µg-4 mg/d of folic acid, particularly obese and Hispanic women who are at increased risk for NTD-affected pregnancies; 2) Be aware of the increased likelihood of lactose intolerance among African, Asian, Hispanic, and Native American women, who may require supplemental calcium and vitamin D; 3) Raise awareness of the importance of increased omega-3 fatty acid intake for all women (and men), especially during the reproductive years.

Prescription prenatal vitamins (PNVs) provide options for closing the nutritional gap. Four brands of PNVs contain omega-3s: CitraNatal® (14 nutrients), Duet® DHA (17 nutrients), Prenate DHA® (10 nutrients), and the PrimaCare® line (currently unavailable). The quantity and type of omega-3s vary across brands, from 250 to 400 mg of DHA and 40 to 175 mg of EPA.

Chelated versions of iron in PNV supplements are typically well tolerated (eg, IronAid™, Ferrazone®), and these 4 PNV brands each provide at least 27 mg/d during pregnancy. Gastrointestinal intolerance is typically induced by iron doses >45 mg/d.

The Duet PNVs have the highest levels of calcium (200 mg) and vitamin D (400 IU), and only Duet contains 3 additional minerals important during pregnancy: copper (essential for proper utilization of iron), magnesium (for bone health), and zinc (for tissue growth and immune function).

Ob/gyns can partner with women to preserve and improve health across their lives. Factors such as body weight, race, ethnicity, and age influence nutritional requirements, and consideration of how these factors affect a woman's nutritional status may help clinicians improve maternal health before, during, and after pregnancy and promote optimal infant health from day 1. As recommended by ACOG, the RDAs should be used to ensure adequacy of a woman's dietary and supplemental nutrient intake, with the caveat that more is not always better.

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TABLE. Daily Requirements for Key Nutrients for Women of Reproductive Age Recommended by ACOG Compared With IOM and WHO Guidelines[a,b]

Nutrient	ACOG[3]	IOM (RDA) Adult Women[2]	IOM (RDA) Pregnant Women[2]	IOM (UL)[2]	WHO[4]
Calcium	1000 mg	1000 mg	1000 mg	2500 mg	NR
Iron	27 mg	18 mg	27 mg	45 mg	NR
Folate	600 µg (4 mg if high risk)	400 µg	600 µg (4 mg if high risk)	1000 mg	400 µg
Vitamin A	770 µg	700 µg	770 µg	3000 µg	NR
Vitamin C	85 mg	75 mg	85 mg	2000 mg	NR
Vitamin B_6	1.9 mg	1.3 mg	1.9 mg	100 mg	NR
Vitamin B_{12}	2.6 µg	2.4 µg	2.6 µg	ND	NR
Omega-3 fatty acids	NR	1.1 g ALA	1.4 g ALA	NA	300-500 mg DHA+EPA 800 mg-1.1 g ALA

ALA=alpha-linolenic acid; NA=not applicable; ND=not determinable; NR=no specific recommendation; UL=upper limit.

[a] ACOG does not specifically state omega-3 fatty acids as a key nutrient in patient education material for nutrition in pregnancy; however, the Council for Nutrition included the IOM and WHO recommendations for omega-3 fatty acids because of emerging evidence of the importance of omega-3 fatty acids in human development.

[b] The RDAs listed in this table are for women 19-50 years of age.

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Acknowledgments: The authors thank Dana L. Randall, MS, PharmD, of Arbor Communications, Inc., Ann Arbor, Michigan, for medical writing assistance on behalf of Xanodyne Pharmaceuticals, Inc., Newport, Kentucky.

This supplement was produced by the customized publication department of Elsevier/INTERNATIONAL MEDICAL NEWS GROUP. Neither the editor of Ob.Gyn. News, the Editorial Advisory Board, nor the reporting staff contributed to its content. The opinions expressed in this supplement are those of the faculty and do not necessarily reflect the views of the Publisher.

Faculty Disclosures:

Dr Bradley is a consultant for Xanodyne Pharmaceuticals, Inc.

Ms Reardon has nothing to disclose.

Dr Thorp has nothing to disclose.

Dr Underwood has nothing to disclose.

Dr Viteri has received clinical grant funding from the University of California Institute for Mexico and the United States.