
Workshop Summary

Recommendations for Accelerating Global Action to Prevent Folic Acid–Preventable Birth Defects and Other Folate-Deficiency Diseases: Meeting of Experts on Preventing Folic Acid–Preventable Neural Tube Defects

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BACKGROUND: In April of 2003, The Micronutrient Initiative, in collaboration with several other organizations, convened a group of knowledgeable scientists and policy experts to discuss ways to accelerate the global pace at which countries implement effective and sustainable programs to prevent folic acid–preventable birth defects and other folate-deficiency diseases. Programs implemented to date by fewer than 40 countries have prevented only 10% of the estimated 240,000 annual cases of folic acid–preventable spina bifida and anencephaly. **METHODS:** Participants in this meeting summarized and presented scientific evidence showing that increased consumption of synthetic folic acid prevents a large proportion of spina bifida and anencephaly cases. They also reviewed related guidance and endorsements issued by national professional societies and advisory bodies as well as policies and programs implemented by some countries that have already demonstrated successful results in terms of reduced rates of neural tube defects and improved folate nutrition. **CONCLUSIONS:** The group formulated and discussed recommendations and strategies for increasing the pace of neural tube defect prevention globally. The recommendations and strategies are published here. *Birth Defects Research (Part A) 70:835–837, 2004.* © 2004 Wiley-Liss, Inc.

Key words: folic acid; fortification; multivitamins/supplements; breakfast cereals; birth defects; cardiovascular disease

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INTRODUCTION

In April of 2003, The Micronutrient Initiative, in collaboration with several other organizations, convened a group of knowledgeable scientists and policy experts to discuss ways to accelerate the global pace at which countries implement effective and sustainable programs to prevent folic acid-preventable birth defects and other folate-deficiency diseases. Programs implemented to date by fewer than 40 countries have prevented only 10% of the estimated 240,000 annual cases of folic acid-preventable spina bifida and anencephaly. Participants in this meeting summarized and presented scientific evidence showing that increased consumption of synthetic folic acid prevents a large proportion of spina bifida and anencephaly cases. They also reviewed related guidance and endorsements issued by national professional societies and advisory bodies as well as policies and programs implemented by some countries that have already demonstrated successful results in terms of reduced rates of neural tube defects and improved folate nutrition. Lastly, the group formulated and discussed recommendations and strategies for increasing the pace of neural tube defect prevention globally.

Following the publication in 1991 of a multicenter randomized controlled trial demonstrating that periconceptional folic acid supplementation prevents approximately 70% of neural tube defects (NTDs), various scientific and professional groups issued recommendations to the public and to practitioners about steps that individual women should take to prevent an affected pregnancy (Medical Research Council Vitamin Study Research Group, 1991). Other studies have supported this finding (Czeizel and Dudas, 1992; Berry et al., 1999). Subsequently, public health and nutrition authorities in some countries took steps to implement corrective action that would offer various levels of protection to the general public from folate deficiency. Such resulting actions and statements are useful for any public or private group wishing to address folic acid deficiency in their own country (Centers for Disease Control and Prevention, 1992; National Health and Medical Research Council, 1994; 1995; Food and Drug Administration, 1996; Institute of Medicine, 1998; American Academy of Pediatrics, 1999; Bentley et al., 1999; Committee on Medical Aspects of Food and Nutrition Policy (COMA) of the Department of Health (UK), 2000; De Walle and De Jong-Van Den Berg, 2002). Mandatory fortification of flour with folic acid has been followed by substantial increases in median serum folate concentrations, prevention of 20–50% of NTDs, the virtual elimination of folate-deficiency anemia, and reductions in median concentrations of homocysteine (Lawrence et al., 1999; Honein et al., 2001; Persad et al., 2002; Ray et al., 2002a, 2002b; Williams et al., 2002; Castilla et al., 2003; De Wals et al., 2003; Hertrampf et al., 2003).

RECOMMENDATIONS TO PREVENT FOLIC ACID-PREVENTABLE BIRTH DEFECTS AND OTHER FOLATE-DEFICIENCY DISEASES FROM OTTAWA MEETING OF EXPERTS

Overarching

Because all women capable of becoming pregnant should consume at least 400 μg daily of synthetic folic acid to prevent pregnancies being affected by an NTD and/or

folate-deficiency anemia, we encourage all countries to urgently adopt effective and sustainable policies and strategies to increase folic acid consumption among all women of reproductive age.

Fortification

1. Because mandatory fortification of cereal grains (e.g., wheat flours, corn flours, and rice) with folic acid (pteroylmonoglutamic acid) will maximize birth defects prevention and improve folate nutrition for the general population, we recommend that all countries implement mandatory fortification of cereal grains without delay at an initial concentration between 140 and 280 μg of folic acid per 100 gm of flour.

Several countries in North and South America have begun folic acid fortification of cereal grains. Different amounts of folic acid are added in different countries, based on the level of consumption of cereal grain products and the availability of other sources of synthetic folic acid. In Chile, women have an average daily consumption of 400 μg of folic acid from fortified wheat flour; in the United States and Canada, women have an average consumption of between 100 and 200 μg from fortified cereal grains. In Chile, wheat flour is fortified with 220 μg of folic acid per 100 gm of flour, and in the United States, the concentration is 140 μg of folic acid per 100 gm of flour. In Canada, the concentration is 150 μg of folic acid per 100 gm of flour. New Zealand and Australia permit flour to be fortified up to 280 μg of folic acid per 100 gm of flour. It is desirable for as many women as possible to consume 400 μg of synthetic folic acid from fortified grains. In some countries, fortification of other foodstuffs may be desirable.

2. Folic acid fortification of grains is safe and should result in a 20–50% reduction in rates of spina bifida, a substantial reduction in serum homocysteine concentrations and will virtually eliminate folate-deficiency anemia. Total prevention of folic acid-preventable birth defects is likely to require complementary folic acid pill programs and/or increases in the concentration of folic acid in fortified foods.

3. Bilateral, multilateral and private agencies should give immediate priority to providing financial and technical assistance for three to five years to assist in the development and the implementation of sustainable, national fortification programs.

4. Fortification with iron and vitamin B₁₂ should be considered, but folic acid fortification should not be delayed because of issues raised regarding iron or vitamin B₁₂.

5. A small proportion of bread and grain products may be unfortified, and so labeled, to provide access to unfortified products for the minority who may want them. In some countries with existing folic acid fortification programs, e.g., the United States, whole grain products are not fortified.

6. The fortification process should include regulatory oversight of quality control in the mills and monitoring of the concentration of folic acid in fortified products.

7. Serum/plasma folates in subgroups of the population should be measured to assess the effectiveness of fortification programs.

8. Disease outcomes in the population should be monitored, including spina bifida and anencephaly, folate-deficiency anemia, and mortality from heart attacks and strokes as well as the rate, severity, and course of vitamin B₁₂ deficiency neuropathy.

Research is needed to identify effective strategies to fortify flour milled in small mills.

Dietary Supplements/Pills/Capsules/Drugs

1. Products (capsules, pills, tablets, food/dietary supplements, and/or drugs) with at least 400 µg of folic acid should be widely available and accessible without financial or other barriers.

2. Products (e.g., capsules, pills, tablets) with 4 or 5 mg of folic acid should be widely available without financial or other barriers for women who have had a previous pregnancy affected by an NTD, and for other women who wish to have the extra level of protection from this higher dose.

3. Research is needed to identify effective, sustainable, culturally appropriate strategies to increase to 90% the proportion of women who daily consume dietary supplements/pills/capsules/drugs with 400 µg of folic acid in them.

Voluntary Fortification of Food Products

Permission should be granted for a limited number of foods to be voluntarily fortified with up to 400 µg of folic acid per serving so that women who find it most convenient to consume folic acid from such sources can do so.

Natural Folate

Public health education campaigns should be considered as one possible strategy to increase the consumption of foods rich in natural folates.

Creation of a Folic Acid Technical Assistance and Advocacy Center

A global folic acid technical assistance and advocacy center should be established, dedicated to increasing the pace at which folic acid-preventable spina bifida and anencephaly and other folate-deficiency diseases are prevented. This group should be charged with providing assistance to implement effective strategies that increase folic acid consumption and helping to establish systems that can track the process and outcome of folic acid programs to prevent NTDs. Such systems may include NTD surveillance as well as surveys of serum folate concentrations in women of reproductive age.

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