Commentary

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Folic acid: the opportunity that still exists

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A woman's folic acid intake before conception and during early pregnancy plays a crucial role in preventing neural tube defects[1,2] and has been associated with preventing other congenital abnormalities as well.[3] Health agencies and professional societies concerned with obstetrics and children's health have recommended that all women of childbearing age take a daily supplement of folic acid,[4–6] especially because 50% of pregnancies in North America are mistimed or unplanned. However, studies[7–9] have found that less than 30% of women who attend their first prenatal clinic have taken extra folic acid before conception or early in pregnancy when the neural tube closes (i.e., 2 weeks after the first missed menstrual period). Moreover, James House and colleagues[10] (see page 1557 in this issue) report that 5 years after this important information about folate's protective effects became available and recommendations were broadly publicized, more than 25% of women in Newfoundland who attended their first prenatal clinic had serum folate levels that were low enough to be of concern.

At least 5% of babies are born with some serious congenital anomaly.[11] Although publicity to increase awareness and prevent birth defects has focused on folic acid intake and neural tube defects, several studies suggest that taking multivitamins containing folic acid during the periconceptional period can reduce the risk of other conditions such as congenital heart defects,[3,12–14] urinary tract anomalies,[14,15] orofacial clefts,[3,16–18] limb defects[12] and pyloric stenosis.[3] It is estimated that as many as half of all birth defects can be prevented if women of childbearing age consume an adequate amount of folic acid, either by eating sufficient foods that are fortified with folic acid or by taking vitamin supplements.[19]

Despite attempts to increase public awareness, by the mid-1990s it became clear that many women were not changing their eating habits, nor were they taking vitamin supplements before conception. One way to increase folic acid intake without relying on a change in behaviour is to add it to foods that are normally consumed. In 1998 Canada followed the American lead by allowing fortification of enriched grain products with what would increase intake by about 100 μg of folic acid a day. Given that the average North American diet provides 200 μg of folic acid per day, the addition of 100 μg would bring the average daily intake to about 300 μg. However, studies suggest that a daily intake of 400 μg (0.4 mg) may be required to reduce the risk of birth defects,[20] and many people consume less than 200 μg daily because they do not eat (or perhaps cannot afford) enough of the vegetables and fruits that are high in folic acid — witness the 25% of pregnant women in Newfoundland surveyed by House and colleagues.[10]

In Canada folic acid fortification of enriched grains is not mandatory; rather, it is permitted[21] so that we can be commercially compatible with the United States. The failure to date to add adequate amounts of folic acid to the grain chain is linked to a possible problem with B_{12} deficiency. It is estimated that up to 5% of elderly adults are B_{12} deficient, and in these people large doses of folic acid could mask the anemia associated with B_{12} deficiency and lead to possible neurologic damage.[22]

In addition to preventing neural tube defects, folic acid also likely plays an important role in reducing the risk of cardiovascular disease, including coronary artery disease, stroke and peripheral vascular disease,[23–26] and in reducing the risk of cancer.[19,27,28] Folate is also needed to make DNA, required for growth, repair and an adequate immune response. Thus, grain fortification is beneficial not only for embryonic and fetal development but also for important metabolic processes in people of all ages.

It is likely that 100 000 years ago our ancestors ate 14–16 servings of fresh fruits and vegetables (the major natural source of folate) each day. Folate is, however, heat labile, so with cooking and our modern diets very few people consume the amounts of fruits and vegetables that our bodies have evolved to expect. Consequently, we are all at risk of inadequate folic acid intake through diet alone.

Why are we not taking every opportunity to stay healthy — to provide our bodies with all the tools necessary to function properly? More importantly, why are some of us not giving the children of tomorrow every opportunity to grow normally and reach their full potential? Perhaps because we are inundated every day with so much information about nutrition and the supplements we should take, information that seems to change monthly. It is little wonder that we have become bored with it all and pay little attention. However, the folic acid story has not changed and is not boring — it has only become more compelling. We would all benefit from a supplement of 400 μg of folic acid a day, alone or in a multivitamin. We do not need megadoses, but it is clear that our bodies and those of developing babies need adequate amounts of folic acid to function normally.

The knowledge we have gained in studies on folic acid should be seen as a public health opportunity[29,30] and an opportunity for every individual. The report on women from Newfoundland[10] suggests that at least 25% of the population, and I suspect a similar percentage in the other provinces, is missing the opportunity to be fully healthy. While we await further data, it behooves us all to ensure we are getting enough folic acid — as children for normal growth, as young women to prevent birth defects and as adults of all ages to reduce the risk of cardiovascular disease and cancer. All Canadians can benefit.

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