Neural tube Defects are a significant preventable problem that has affected over 24,000 pregnancies in the United States and Arkansas since 1998. Many and perhaps most of these malformations and deaths are easily preventable by increasing folic acid.

Neural tube defects (NTDs) are the third most common US birth defect. Every year over 3000 NTD cases miscarry, are stillborn, therapeutically aborted, die shortly after birth, or have lifelong disabilities with varying degrees of paralysis [1]. NTDs include anencephaly when it occurs in the cranial region (always fatal) and spina bifida (usually associated with lifelong paralysis) occurring in the spinal region. These congenital anomalies develop by the 28th day of conception, so by the time most women discover that they are pregnant it is already too late to begin folic acid supplementation.

Both observational and randomized trials have produced data supporting the view that folate in the proper dose given well before conception, can markedly reduce the risk for NTD by 50-70% [2]. In Chile, where the fortification levels are 50% more than that for the US, they have observed almost a 50% reduction in NTDs compared to the US reduction of only 29% [3]. Fetal deaths in the US from neural tube defects have decreased from 1,180 prior to fortification to the current level of 840 per year after fortification.

In 1996 the recommended dose of folic acid fortification was reduced 50% (to 140 µg per hundred grams of flour) by the FDA to reduce the risk of “covering up B-12 deficiency with the resultant development of irreversible neurologic damage" [4]. Prior to folic acid fortification in the US there were 12 cases each year nationally of B-12 deficient neurological damage. After fortification there was no statistically significant change. A review by the Institute of Medicine (IOM) reached the conclusion that a minimum of 5 mg of folic acid per day is necessary to correct the hemoglobin level in human subjects who fail to absorb B12 normally and thereby conceal the diagnosis, of pernicious anemia [5,6].

When petitioned to double or quadruple food fortification levels of folic acid, the FDA recently stated that there is "some" evidence that folic acid supplementation resulted in a small increase in colon cancer in the US population. The assertion that current levels of folic acid fortification have increased B-12 deficient neurological damage and colon cancer rates have never been substantiated with peer-reviewed studies. A recent study from the Nurses’ Health Study (the world's largest ongoing prospective cohort study) has shown long-term supplementation with folic acid is associated with a 75% reduction in the risk of colon cancer [7].
Attempts at preventing NTDs by educating women of childbearing age to take supplemental folate daily have not been successful [8]. Seventy percent of teenage pregnancies in Arkansas are unplanned. Low serum folate levels (< 3 ng/mL) have declined from 21% of the US population pre-fortification (1988 to 1994) to less than 1%; yet this reduction has only resulted in a 25% decrease in NTDs [9]. We suggest that the minimal level for serum folate (to prevent NTD) should be raised. Folic acid fortification is associated with several other benefits; cleft lip, cleft palate, and outflow congenital heart defects have been decreased.

A recent observational study by Bukowski has shown a 50-70% decrease in preterm deliveries (< 32 weeks) in all racial and ethnic groups [10]. Taking a 400 µg folic acid supplement for at least one year before becoming pregnant is associated with a 50-70% decrease in deliveries occurring before 32 weeks. Deliveries at less than 32 weeks gestation account for only 2% of all deliveries, but account for 50% of all infant mortality (IM).

The standard recommendation of taking a daily prenatal vitamin during and before pregnancy (with the exception of folic acid) has been shown in multiple studies to be of limited value. British randomized medical studies, in women with a previous NTD, show a 70% reduction in repeat NTDs among women taking 4000 µg of a folic acid supplement while trying to get pregnant [11]. Adding the standard prenatal vitamin to the folic acid supplement caused no improvement in NTD rates and use of the prenatal vitamin by itself without the folic acid showed no improvement over taking a placebo in this randomized prospective study.

The case for increasing the level of folate in food is compelling. In the interim, the only alternative to the FDA allowing increased levels of folic acid fortification in food is to convince all reproductive age women to take 400 to 800 µg of folic acid food supplements daily. These are available over-the-counter without prescription.

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REFERENCES