My sister has just given birth to a baby with spina bifida. I am getting married next year, and my fiance and I have been wondering if there is a familial tendency to spina bifida.

Several entities fall within the group of neural tube defects we call spina bifida. These range from anencephaly (no brain) to meningoencephalocele (an opening at the back of the head through which brain and meninges protrude), to meningocele (a bag of meninges protruding from the spine), to spina bifida occulta, in which there may be only a bony defect in the vertebrae.

All of these conditions result from defective enfolding of tissue destined to make up the central nervous system. These embryological mishaps are more common in some racial groups, and a woman who has one child with a defect is more prone to have a second (about a one-in-20 risk).

For you to have a baby with spina bifida, a slightly increased risk exists, but not much more than average. During pregnancy, screening that includes measuring a compound called alpha-fetoprotein is now almost universally recommended. This test, along with a detailed ultrasound examination at 18 weeks of pregnancy, will pick up most cases of spina bifida. The problem is that such testing picks up the problem only after it is present.

Fortunately, prevention seems to be possible for many. Folic acid (also called folate), a vitamin of the B group, has been shown to reduce the incidence of spina bifida by at least 50 percent. But this is just one of the benefits of folic acid. This vitamin is essential for adding methionine groups to proteins, and the DNA building blocks called pyrimidines and purines. It also plays a role in carbon metabolism, which is important in cellular division. The central role folic acid plays is further evidenced by the fact that it reduces the risk of colon cancer in those taking it regularly.

The Food and Drug Administration considers the role of folic acid so important that they have mandated its addition to flour in the United States. They calculated it so as to give 200 micrograms of extra folic acid per day to the average diet. Some think this is an inadequate amount for reasons I will explain.

Folic acid occurs primarily in green leafy vegetables, hence its name; but many people, if not a majority, are below requirements in folic acid intake. In fact, some think humans are folic acid-deprived on the whole.

Studies have shown no toxic effect or overdose level for folic acid, and it has been recommended that foods should be fortified to provide 400 micrograms per person per day. At this level the incidence of spina bifida is reduced to half the baseline rate.

It is important for a prospective candidate for a pregnancy to be on this supplement before conception, as the neural tube development is well on its way by the time pregnancy is recognized. In situations in which there has been an infant with spina bifida, like your sister’s child, subsequent pregnancies should be preceded by an intake of 4,000 micrograms (4 milligrams) per day. It is believed that some people may have a defective metabolism that predisposes to spina bifida.

The recommendation that everyone—men and women—take 400 micrograms per day is also based on
another finding; namely, that homocysteine levels may be lowered with folic acid supplementation. There is an increased risk of coronary heart disease when homocysteine is elevated. Low vitamin $B_{12}$ levels also tend to raise homocysteine levels, so vegetarians, who tend to have lower vitamin $B_{12}$ levels, probably should be advised to take a multivitamin tablet daily. This would satisfy both the folate and $B_{12}$ requirements.

To summarize: Your risk of spina bifida occurring in your children is not much different from that of the general population. But you, like everyone else, would benefit by taking at least 400 micrograms of folic acid per day. The easiest way is to take a multivitamin pill daily. When you begin to seriously consider getting pregnant, it would not hurt to take an additional 1,000 micrograms of folic acid as a separate and additional vitamin dosage.

All of us should be getting a supplemental 400 micrograms of folate on a regular daily basis. Of course, the natural source of folate is those green leafy vegetables. So if at all possible, parents should see to it that the entire family gets a generous serving every meal.

As doctors, we might be smart to make little speeches about folate whenever we attend weddings; a year’s supply of folic acid given to the couple would certainly emphasize this vitamin’s importance!

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