Periconceptional folic acid supplementation and the prevalence of neural tube defects in Europe

The study discussed here, on the prevalence of neural tube defects in Europe, shows that the recommendations by the European authorities to induce mothers-to-be to start using folic acid supplementation before they become pregnant, in order to reduce the risk of neural tube defects in their child, have not proved to be effective. The rate of neural tube defects has not decreased in the twenty years since the recommendations for folic acid were introduced; it has merely resulted in a considerable increase in the number of pregnancy terminations due to neural tube defects. If it were the case that the recording of congenital abnormalities by the various registration systems involved in this study had substantially improved in the course of the study period, this could have explained why the prevalence of neural tube defects did not decrease. However, the authors report that they have no reason to assume that the findings can be explained by changes in the recording of congenital abnormalities.

Research into the use of folic acid by pregnant women has shown that timely initiation of folic acid supplementation remains a problem. Recent questionnaire surveys in Denmark and France found that a mere 10 and 15%, respectively, of the women in these countries start using folic acid supplementation before they become pregnant, even though a large majority of pregnant women reported that they had heard about the importance of folic acid supplementation before they became pregnant. Of the European countries, the Netherlands is doing very well in this respect. The 2009 EUROCAT report showed that the Netherlands was the only country where the majority of women started using folic acid supplementation in time. This is probably the result of the extensive efforts by the national government and the official campaigns emphasising the importance of timely folic acid supplementation. Although extensive campaigns targeting women of reproductive age have clear effects, many women still fail to start folic acid supplementation in time, and its use and the decline of the rate of neural tube defects are stagnating in the Netherlands as well. Surveys among pregnant women have shown that the number of women correctly using folic acid supplementation in the 2005–2009 period was around 51%, and the incidence of recorded neural tube defects in the period fluctuated around 8 per 10 000 births.

Compulsory enrichment of foodstuffs with folic acid has proved to be an effective method to reduce the number of neural tube defects, so this could contribute considerably to reducing the rates in Europe. However, the advantages of compulsory enrichment of foodstuffs should be weighed against the risks. For instance, folic acid has been found to play a dual role in the development of cancer. Whereas folate plays an important part in the repair of DNA damage, and folic acid supplementation can help prevent cancer in the case of a shortage, excess folic acid has been linked to stimulation of the growth of cancer cells. Unfortunately, the optimum amounts of folic acid with regard to cancer risk remains unclear. Folic acid might influence the consequences of vitamin B_{12} shortage, which is relatively common among older people. The symptoms of such a shortage might be less obvious, but the adverse consequences, like anaemia and neurological problems, might be greater. In addition, questions have arisen about the consequences of the epigenetic changes brought about by folic acid, and of unmetabolised folic acid in the blood. It is therefore important to ensure that implementation of compulsory food enrichment does not lead to members of the public being exposed to excessive dosages of folic acid, and that the right target population is reached. In the USA, folic acid is being added to wheat flour and other cereals, and the amounts of folic acid added have been chosen so as to optimise the intake by women of reproductive age, while at the same time minimising the risk of taking in more than 1 mg a day (the safe upper margin established by the Food and Drug Administration (FDA). Nevertheless, finding the right balance remains difficult. The fact that the folic acid is being added to basic products like wheat flour, in order to reach as many women as possible within the relatively limited target group, makes it very difficult for large groups of people outside the target population to avoid enriched products.
Just as with many other lifestyle changes, large-scale implementation of preventive measures against low but serious risks, such as neural tube defects, turns out to be difficult, even in well-intentioned target populations like those in the Netherlands. Uncertainties remain about the disadvantages of enriching foodstuffs with folic acid, and the lack of intervention studies means there is little hard evidence. As a result, the prevention of neural tube defects by means of folic acid supplementation in the Netherlands will for the time being have to remain restricted to continuing to emphasise the current policy of educating women who intend to become pregnant. In other words, no policy change is imminent.

References*


*The literature refers to the Dutch text