The Dutch folate supplementation education programme: challenges in raising awareness

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Introduction

Soon after randomized controlled trials had proven the beneficial effects of folic acid in reducing the risk of fetal neural tube defects (NTDs), several countries began to translate this knowledge into policy [1]. Some countries opted to fortify staple foods, for example flour and bread, whilst others encouraged voluntary fortification of food products, such as breakfast cereals. Some countries advised women to adopt a healthy diet containing sufficient folates. In the Netherlands many women plan their pregnancies. Furthermore, there is a strong feeling that people should be free to choose what they eat, so fortification was not considered appropriate. Therefore in 1993 the Dutch Inspectorate of Public Health advised that all women planning a pregnancy should make sure they had an adequate intake of folic acid by taking one 0.4 mg folic acid tablet every day for at least 4 weeks before conception and continuing until 8 weeks after conception [2]. A one-off public health campaign was organised in 1995 to spread this advice to all young women, whatever their level of education [3]. Further measures were added in the years to follow. This paper summarizes these campaigns and the results that were achieved over the next 10–15 years.

The Dutch folic acid campaign

A national information campaign on the need for folic acid supplementation was carried out in the autumn of 1995. As women wishing to conceive are hard to distinguish from other women of a similar age, a mass media campaign was chosen to inform mothers-to-be. Table 1 details the ways in which information was disseminated. Advertisements in newspapers and women’s magazines employed the slogan ‘Folic acid — even before you’re pregnant’. Health authorities were well aware of the difficulty of reaching less educated women, therefore the effects of additional measures targeting less educated women in two regions were studied [4]. These additional measures included advertisements at bus stops and in free local newspapers.

The aim of the campaign was to reach at least 70% of women wishing to conceive and to achieve appropriate folic acid use in 65% of women who had heard of folic acid. The campaign was successful in increasing knowledge: the percentage of women who reported that they had heard of folic acid before their last menstrual period increased from 41.7% in 1995 to 77.3% in 1996. The channels of information chosen to inform less educated women were not successful in mitigating socioeconomic differences: for instance, only 5.7% of women with a low educational level vs. 17.6% of women with a high educational level recalled seeing the advertisement at bus stops [4]. Folic acid use during the time around conception increased from 16.8% in 1995 to 48.6% in 1996, almost reaching the aim of 65% of women who had heard of folic acid. However, some used it for a short period only. The use of folic acid during the entire advised period of 4 weeks before conception until 8 weeks after conception was reported in 1996 by 16.5% of women with a low level of education, by 22.6% with

Table 1: Media used to convey the message that folic acid protects.

<table>
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<tr>
<th>National campaign</th>
<th>Additional regional campaign</th>
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<tr>
<td>Leaflets</td>
<td>Local newspaper advertisements</td>
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<tr>
<td>Billboard posters</td>
<td>Posters in doctors’ surgeries</td>
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<tr>
<td>Advertisements in the press</td>
<td>Advertisements at bus stops</td>
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a medium level of education, and by 32.1% of those with a high level of education [5].

The campaign organizers were well aware of the importance of the role of health care workers: once women received the message from the media, it was likely that they would ask their general practitioner (GP) to confirm it. Therefore, before the start of the campaign, GPs, midwives, gynaecologists and pharmacists were informed of the campaign. It turned out that women did indeed mention their GP as one of the most important sources of information (23–31% of women had used their GP as source of information in 1996) [4]. Other important sources were the pharmacist (10–19%), gynaecologist (5–11%) and midwife (0.6–4%).

The challenge of reaching an ever-changing population of mothers-to-be

The government subsidized this one-off campaign to inform women of the protective effects of folic acid. However, women planning a pregnancy constitute a population that is difficult to reach, rapidly changing (it renews itself by roughly 50% every year) and generally unaware of the risks that exist before conception and how they may be prevented [6]. Therefore implementation of folic acid advice requires sustained and structured efforts to inform a constantly changing target group [6]. The Dutch patient and parents’ organization VSOP has a number of internet sites to inform parents-to-be of prepregnancy risk factors and it includes folic acid information on its websites (www.erfocentrum.nl; www.slikeerstfoliumzuur.nl; www.zwangerstraks.nl). Physicians continue to spread the message, and the media continue to pay attention to the issue every now and then.

\[\text{“Women planning a pregnancy constitute a population that is difficult to reach, rapidly changing and generally unaware of the risks that exist before conception and how they may be prevented.”}\]

New ways of spreading the message

Women planning a pregnancy often do not first visit a health care facility. Usually they decide, together with their partner, to stop contraception and ask for health care only when they are about 10 weeks pregnant.

Pharmacists agreed to advise contraceptive users to begin taking folic acid if they stopped using contraception [7, 8]. Several interventions were developed, including a sticker on the contraceptive packet advising women to start taking folic acid tablets if stopping the Pill. This source of information was mentioned by 15% of pregnant women in 2005, only 1 year after the start of the campaign [9]. Using the contraceptive packet to inform a cohort of sexually active women constitutes a sustained and structured way to confer information. Although these women are requesting contraception, they are also a group who may want to get pregnant in the future. After a pilot phase the number of participating pharmacies increased in 2007 to about half of all pharmacies in the Netherlands.

The well-baby clinic is a place where almost all mothers come with their baby and where information for the next pregnancy can easily be passed on. Fertility clinics too can play a role.

\[\text{“Using the contraceptive packet to inform a cohort of sexually active women constitutes a sustained and structured way to confer information.”}\]

Ten years after the campaign

Miscellaneous data summarizing a decade of studies and debates on folic acid in the Netherlands are given in Table II. In the northern Netherlands, surveys using the same methodology were performed six times between 1995 and 2005. Pregnant women filled in a questionnaire at their first or second antenatal visit. In 2005, 51% of women (vs. only 0.4% in 1994) had used folic acid for the entire advised period (Figure 1) [9]. This level has been maintained up to the present day. An analysis by EUROCAT showed that a 14% decrease in the prevalence of babies born with NTDs in the northern Netherlands between 1988–1992 and 1994–1998 could be attributed to the increase in folic acid intake [12]. Such high levels of folic acid supplementation have not been seen in any other European country. Voluntary folic acid supplementation has therefore been shown to help prevent the occurrence of NTDs.

However, although there was an overall increase in awareness of and use of folic acid, research showed that the message had not successfully reached women in the lower socioeconomic groups. The difference in taking folic acid in the advised period between women with a high vs. a low educational level persisted (63% vs. 31%) [9].

Evidence shows that the following factors modify folic acid supplementation:
1. Knowledge about the effect of low folic acid levels and the importance of timing for conception are the main determinants. This is independent of the level of education.

2. Lower age and higher parity are inversely related to adequate folic acid supplementation.

3. The use of oral contraceptives is a positive predictor (odds ratio 2.1).

4. Oral contraceptives and other effective methods of contraception are widely used in the Netherlands, leading to a high percentage of planned pregnancies and thus enabling planned folic acid use as well.

The aim of the Dutch Ministry of Health to have 70% of women using folic acid adequately by 2010 has not been achieved. In many other European countries the results are even worse [10]. While the total prevalence of NTDs in the Netherlands, the United Kingdom and Ireland has decreased, it has remained stable in most European Union countries. Therefore the strategy to increase folic acid use is again under discussion and a proposed public health policy of folic acid fortification of staple foods in Europe is being examined [10].

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Cost-effectiveness of folate supplementation

Several simulation studies and calculations show that both food fortification and supplementation promotion programmes are cost-effective [13, 14]. These studies are based on conservative assumptions, i.e. using only direct medical costs of NTDs and not including, for example, the costs of cardiac anomalies.

No overall retrospective empirical cost-effectiveness study for the Dutch situation has been conducted, but calculations indicate the accuracy of
the theoretical models. A 14% reduction in the birth prevalence of NTDs would save the lifetime extra medical costs of at least 45 cases per year, which amounts to about EUR 41 million over the last 10 years. Direct expenditures for the campaigns, implementation programmes and evaluation studies since 1995 do not exceed an estimated EUR 2 million and the costs of folic acid supplements over this time period will not exceed EUR 10 million. A recent internal calculation showed that if a EUR 2.2 million investment in the next 10 years at least led to the maintenance of, or a 2% increase in, adequate folic acid intake the costs of this investment would be fully reimbursed from the savings made.

Summary and future developments

The Dutch case shows that among a population where there is a high take-up of effective contraception and therefore a high percentage of planned pregnancies, extremely cost-effective results can be achieved with sustained public health information and one-to-one education in a regular health care setting. Monitoring, as well as the development and research of new methods, can help maintain and increase the use of folic acid supplementation.

There are three general methods of folic acid supplementation:
1. Food fortification.
2. Promotion of individual folic acid supplementation among women of reproductive age.
3. Periconception supplementation in planned pregnancy.

Food fortification

Relatively low but safe levels of folic acid concentrations are used in food fortification, but these give only partial protection. Food fortification is nevertheless a powerful initial measure to achieve a basic level of prophylaxis. Better results can be achieved with additional individual supplementation and higher doses in the periconceptional period.

In Europe, the potential dangers of folic acid always drew more attention than the proven advantages. Every few years a new potential danger of folic acid has been put forward, and public health policy has been reluctant to proceed with food fortification because its potential dangers may be greater than the advantages it would undoubtedly confer.

Considering that folic acid is a vitamin, and that a large proportion of the population does not ingest enough folates, one might prefer to fortify. A recent report of the Dutch Health Council came to this conclusion, amongst others because 8–25% of the Dutch adult and elderly population have insufficient folic acid intake, men more often than women. However, the legal situation in Europe makes it impossible to stop fortifying some foods while stimulating the fortification of other (staple) foods, and thus to avoid overconsumption of folic acid.

Folic acid supplementation

The reliability of folic acid supplementation hinges on individual action and behaviour, which in turn is driven by determinants that can be influenced, such as knowledge, attitude, self-efficacy, decision-making and the availability and feasibility of alternatives.

Action in this case is also linked to a decisive time frame (to start well before pregnancy) and to a specific context (the possible occurrence of a pregnancy in the near future). Therefore the advice to take folic acid supplements throughout the years in which a woman is fertile is good, because it covers both conditions.

On the other hand, from the perspective of motivation this advice suffers from the fact that a woman would have to take supplements for about 15–20 years.
years for an average of two to three periods of 3 months in which she really needs it. Nevertheless, as a preventive method it is very robust, because it offers constant prophylaxis. However, a woman’s lack of interest in considering a future pregnancy when she is not currently planning one is a difficult barrier to overcome.

The most efficient folic acid supplementation can only be by women who have full control of their contraception. This group must include many women in developed countries who become pregnant. Folic acid supplementation by these women requires that they are aware of the importance of folic acid and have access to folic acid supplements when they wish to start a family, but they do not necessarily need to take folic acid throughout their reproductive life.

The possibility of achieving high levels of individual folic acid supplementation is strongly related to contraceptive use and to knowledge and awareness of pregnancy avoidance and/or occurrence. In the Netherlands, for example, 80% of oral contraceptive users starting a family have adequate folic acid levels [9].

**Adding folic acid to the Pill**

How would the addition of folic acid to the oral contraceptive pill contribute to an increase in adequate folic acid intake? The addition of folic acid would have at least two effects. Women of childbearing age would have a better supply of folate. That would be an advantage if they accidentally became pregnant or conceived sooner than expected after stopping the Pill. Information on the beneficial effects of folates could be provided on the contraceptive packet, so that women would be more inclined to take folic acid after stopping the Pill (as shown by the Dutch experience).

“Taking a folic acid-containing oral contraceptive provides increased serum folate levels up to 12 weeks after it is discontinued.”

Taking a folic acid-containing oral contraceptive provides increased serum folate levels up to 12 weeks after it is discontinued; however, there is a sharp drop in folate levels after 4 weeks [17]. Folic acid supplementation is therefore indicated after the contraceptive pill is discontinued. Folic acid awareness remains crucial but can be raised through product-related health education. A good opportunity for the use of a folic acid-containing oral contraceptive pill would be its use between pregnancies both to control pregnancy spacing and to provide folic acid replenishment before the next pregnancy [18].

For the moment, a strategy aimed at increasing the folic intake of fertile women is most urgent, preferably one that also reaches less educated as well as non-Western women.

**References**