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Growing Gap in Folic Acid Intake with Respect to Level of Education in the Netherlands

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Key Words

Neural tube defects • Folic acid • Food fortification

Abstract

Objective: To evaluate the prevalence of the awareness of and the behaviour towards folic acid in 2003 and the trend of folic acid use among pregnant Dutch women between 1995 and 2003 with regard to socio-economic status (SES).

Method: We conducted 2-yearly cross-sectional studies among pregnant women who filled in a questionnaire during the first or second antenatal visit. The highest achieved level of education was taken as a proxy for SES. **Results:** In 2003 the general level of folic acid awareness was high but with significant differences relating to SES; a quarter of the lower educated women did not know about folic acid before pregnancy. Of the subjects with a lower SES 20% knew the correct period of use compared with nearly 50% in the higher SES group. The reported correct use of folic acid among the lower educated women has decreased over the past 3 years (22% in 2003), while it has increased for the higher SES groups (59% in 2003), implying larger differences in health.

Conclusion: In 2003, 8 years after a mass media campaign, awareness and use of folic acid were increased considerably in comparison with the start of the campaign. However, dif-

ferences in knowledge and use of folic acid with respect to the level of education had never been so impressive in the Netherlands as in 2003. A once-only campaign has a short-term effect especially for lower educated women. Implementing strategies to promote folic acid use in daily structural health care systems are needed.

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Introduction

The daily intake of 0.4 mg of folic acid, starting at least 1 month before conception, has been shown to reduce the risk of neural tube defects (NTDs) [1] and probably other birth defects [2]. An increased folate status can be achieved either by (a) increased intake of foods naturally rich in folate, (b) folic acid supplementation or (c) fortification of food with folic acid. A recent review article [3] showed that globally the rate of periconceptional use of folic acid does not exceed 50%. Significant predictors of less folic acid use were amongst others low educational level, young maternal age and unplanned pregnancy. In the Netherlands no fortified foods are available or will be in the near future due to the Dutch law [4]. Knowing that 90% of the Dutch population do not go beyond a daily intake of

300 µg of folic acid [5], folic acid supplementation is the only option to achieve the recommended daily dose of 400 µg. In 1995 the Dutch government launched a mass media campaign aimed to inform the medical professionals as well as women in general, especially those of lower socio-economic status (SES), about the beneficial effects of periconceptional use of folic acid to reduce the risk of foetal NTDs [6]. They recommend to consume 0.5-mg folic acid tablets daily in the periconceptional period. The aim of this study is to present self-reported information on knowledge and use of folic acid among women attending antenatal visits in 2003, to compare it with former surveys in the same population and to explore factors associated with the use of folic acid.

Materials and Methods

We performed 5 studies in the (northern) Netherlands (in 1995, 1996, 1998, 2000 and 2003), all following the same methodology in the same health professionals' practices. The obstetric departments of 3 hospitals and 7 practices of midwives participated in all 5 the surveys. Pregnant women attending their first or second antenatal visit were asked to fill in a questionnaire (the responses in the surveys varied between 70 and 90%). The layout and questions of the questionnaire remained the same in all the surveys, apart from 1 item we added in 2003, i.e. questions about the actual change in behaviour prior to conception, from the moment the women started to actually plan their pregnancy. This item included questions about smoking and drinking behaviour and change of intake of dairy foods. Naturally these questions were only asked to the women who planned their pregnancy.

The questionnaire included questions about knowledge (open questions for the qualitative knowledge), information uptake and use of folic acid. The highest achieved level of education was taken as an indicator for SES. In total there were 7 levels of education ranging from elementary school to university. For statistical analysis the levels were merged into low (levels 1–3), medium (4–5) and high (6–7) education. The data were analysed using SPSS 10 for Windows. Logistic regression was used to calculate multivariate odds ratios.

Results

Knowledge

The most recent data from 2003 presented in table 1 showed that of the 544 respondents, 93% (n = 507) had ever heard of folic acid; 84% (n = 455) before pregnancy. In total 78% (n = 422) had planned their pregnancy, for 17% (n = 93) the pregnancy was not planned but very welcome, and for 5% (n = 26) it was unplanned. Table 1 shows how this is related to the level of education, meaning low-

er educated women plan their pregnancy significantly less frequently. They also smoke more often, start drinking more milk or eating more fruit and drink less alcohol than higher educated women. However, if they smoked, lower educated women stopped or reduced smoking more often than higher educated respondents. This is not true for drinking alcohol; more higher educated women drink alcohol, but they do not significantly change their drinking pattern when planning a pregnancy.

Seventy-nine percent (n = 428) knew about the protective effect of folic acid for NTDs, and 38% (n = 204) knew about the entire advised period. All these aspects of knowledge are related to the level of education (table 1).

For the women who heard about folic acid before getting pregnant (n = 455), the media were the most important source of information, as mentioned by 60% (n = 272). The second source (53%) were the medical professionals (n = 239). One specific source in the Netherlands are the pharmacists who sometimes use a sticker on oral contraceptives informing women about taking folic acid when they stop anti-conception. This sticker was mentioned by 14% (n = 65) of the respondents, irrespective of the educational level.

Use

In 2003, 74% (n = 402) used folic acid in part of the advised period, and 43% (n = 233) used it in the entire advised period, that is 4 weeks before conception till 8 weeks after. Higher educated women used folic acid in the advised period significantly more often, 59%, while this was the case for 22% of the lower educated women. Apart from the level of education, age and ethnicity of the respondent were also indicators for using folic acid in the advised period. Of the younger women (<25 years) 15% took folic acid in contrast to 52% of the older ones (>34 years), and 26% of women belonging to an ethnic minority in contrast to 45% of the Dutch women (not in table 1). From figure 1 it is clear that the gap between higher and lower education with regard to the reported correct use of folic acid in the entire advised period has been growing since 2000.

We asked the 102 women who did not take folic acid for their reason. First of all half of them forgot to answer the question. The remaining women said they were pregnant earlier than expected or heard about it too late in their pregnancy. In general the attitude towards taking folic acid in the future was very positive: 95% would take it in a hypothetical following pregnancy.

Discussion

In 2003, eight years after the mass media campaign, knowledge and use of folic acid were increased considerably. However, the differences in knowledge and use of folic acid with respect to the level of education had never been so impressive in the Netherlands as at this moment. Although 74% of the lower educated women had heard about folic acid before pregnancy, in 2003 only 20% could mention the complete correct period for its use, that is 4 weeks before conception till 8 weeks after. As seen in figure 1 during the first years after the campaign the reported use of folic acid in the advised period increased dramatically in all the women, with the highest percentages in the high-educated ones. However, a sustained effect was not seen in the lower educated women, on the con-

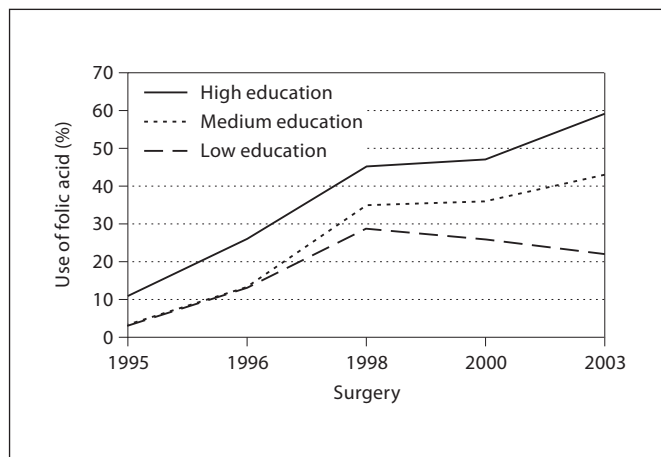


Fig. 1. Use of folic acid in the entire advised period, according to level of education, over the years 1995–2003.

Table 1. Periconceptional awareness and use of folic acid according to level of education in 2003

	Total ¹	Education						Adjusted OR ² (95% confidence interval)
		low		medium		high		
		n	%	n	%	n	%	
All respondents	544	113	21	253	48	166	31	
<i>Demographic factors</i>								
Age, years								
Mean		28.4		28.8		31.3		
Range		16–43		18–43		22–42		
Parity								
Mean		0.96		0.56		0.69		
Range		0–5		0–3		0–4		
<i>Life style factors</i>								
Planning pregnancy	422	71	63	203	81	140	84	2.4 (1.3–4.5)
Drinking more milk or eating more fruit	126	28	39	64	32	31	22	0.6 (0.3–1.2)
Drinking alcohol before pregnancy	280	48	68	119	59	108	77	1.4 (0.7–2.7)
Stopped or reduced								
drinking while planning pregnancy	131	20	42	59	50	50	46	1.7 (0.8–3.7)
Smoking before pregnancy	178	42	59	77	38	54	39	0.4 (0.2–0.7)
Stopped or reduced								
smoking while planning pregnancy	60	17	41	31	40	9	17	0.4 (0.2–1.2)
<i>Awareness of folic acid</i>								
Ever heard of folic acid	507	98	87	237	94	164	99	6.7 (1.4–32.0)
Heard of folic acid before pregnancy	455	83	74	210	83	155	93	4.0 (1.7–9.0)
Aware of protective effect for NTD	428	70	62	200	79	151	91	5.6 (2.8–11.0)
Aware during entire advised period	204	23	20	100	40	80	48	3.2 (1.8–5.7)
<i>Use of folic acid</i>								
Part of advised period	402	63	56	187	74	146	88	4.4 (2.3–8.3)
Entire advised period	233	25	22	107	43	98	59	4.0 (2.3–7.1)

¹ Total may be more than the individual columns because of missing values.

² Adjusted for age and parity. OR: high versus low education.

trary: in this group the reported correct use of folic acid was decreasing over the past 2–3 years.

This survey, and our former ones, showed that even when women are aware of folic acid and of the fact that they have to start taking it before conception, the majority is not using it in the correct period. Therefore we asked more detailed questions about a possible change in lifestyle factors like reducing smoking or drinking alcohol once they were planning their pregnancy. It was clear in this study that, irrespective of the level of education, the majority of the respondents did not change this behaviour. This shows that the concept of a planned pregnancy does not imply a change in the women's actual behaviour, for example stopping smoking or drinking alcohol.

Our data are in agreement with the literature as summarised by Ray et al. [3] and emphasise the importance of folic acid fortification of centrally processed and widely eaten food. However, this is not a feasible option for women living in the Netherlands.

It is the government's responsibility to find ways to reach particularly women of lower SES. Otherwise there is a real danger in the Netherlands of large differences in the prevalence of congenital malformations, especially

NTDs. This requires more active efforts to encourage these groups to take folic acid daily. Mass media campaigns, even when they are targeted at lower educated women, are likely to serve only the more affluent populations, as was shown in this study. All health providers thus have an important role in informing and stimulating women to take folic acid supplements before they become pregnant. A creative approach is being developed in the Netherlands where pharmacists place a sticker about the benefits of folic acid on packages of oral contraceptives and deliver folic acid leaflets to young women visiting the pharmacies [7]. Through the development of better and more creative educational interventions the population as a whole can benefit from the evidence-based effects of folic acid, especially in countries where food fortification is not available.

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