Factors affecting the use of folic acid supplements in pregnant women in Glasgow

ELIZABETH McGOVERN

HAZEL MOSS

GURMEET GREWAL

ANN TAYLOR

STEIN BJORNSSON

JILL PELL

SUMMARY

Background. Use of folic acid supplements preconception, and during the first trimester, is associated with a reduced incidence of first and subsequent neural tube defects. The Department of Health guidelines recommend the use of folic acid supplements by all women planning a pregnancy.

Aim. To ascertain the proportion using folic acid supplements and the factors affecting their use.

Method. Questionnaires were distributed postpartum to the 515 women who delivered normal babies in three maternity units in Glasgow over a four-week period.

Results. Forms were completed by 487 (95%) women. Only 57% took supplements at some point during their pregnancy, and only 21% took them before conception. Failure to take supplements was significantly associated with unplanned pregnancy, younger age, and previous pregnancies. Lack of awareness of the potential benefits associated with folic acid use was the commonest reason cited by women for not taking supplements.

Conclusions. Increased health education through health care professionals and mass media campaigns can improve awareness and thereby increase the use of supplements in planned pregnancies. However, 42% of women in our study had unplanned pregnancies. Intake of folic acid supplements in this group can only be increased by improvements in dietary intake within the population as a whole, and by fortification of commonly ingested foods.

Keywords: folic acid supplements; pregnancy; disease prevention; neural tube defects.

Introduction

Neural tube defects (NTDs), such as anencephaly, encephaloceles, and spina bifida, affect about 2000 pregnancies each year in the United Kingdom (UK). Of these, about 1600 result in terminations of pregnancy or stillbirth. The incidence of NTDs in the west of Scotland is more than twice the national average, which may reflect a low dietary intake of folic acid.

Women who have previously had a baby with a NTD have a 1 in 25 risk of a recurrence during a subsequent pregnancy. Although the risk is 10 times lower in women with no past obstetric history, 95% of NTDs occur in low-risk women.

The Medical Research Council (MRC) randomized trial of folic acid supplements demonstrated a 72% reduction in the incidence of NTDs in women with a past obstetric history of an NTD. A significant benefit has also been demonstrated in women with no past obstetric history. As a result of these studies, expert advisory groups of both the Department of Health and the Scottish Office Home and Health Department have issued guidelines recommending the use of folic acid supplements by all women planning a pregnancy. Despite these recommendations, some studies have suggested that the preconception use of folic acid supplements remains very low. The aim of this study was to determine the proportion of women currently using folic acid supplements and the factors affecting use.

Method

Over a four-week period, questionnaires were distributed to the 515 postpartum women who had delivered normal babies in three Glasgow maternity hospitals. Women who delivered babies with fetal abnormalities were excluded in order to avoid creating additional unnecessary anxiety. The questionnaires were collected by hospital staff before discharge. Information was collected on the woman's age and postcode, whether or not the pregnancy was planned, awareness and use of folic acid supplements during this pregnancy, and intentions regarding future use. The postcode was used to generate a Carstairs deprivation category. Deprivation categories can be attributed to residents within a postcode sector, based on census data on the number of residents within the sector who do not own a car, are unemployed, are in a low Registrar General social class, or are exposed to overcrowding. The categories range from 1 to 7, with 7 representing those areas with the highest level of socio-economic deprivation. Multiple logistic regression analysis was used to determine whether age, socio-economic deprivation, planned pregnancy, and previous pregnancies were associated with the use of folic acid supplements.

Results

Data were returned by 487 (95%) women, of whom 246 (51%) were nulligravida and 146 (30%) had had one previous pregnancy. Their median age was 29 years (IQR 25–33 years). Postcodes were available for 438 women, and 176 (36%) of these belonged to deprivation categories 6 or 7. The current pregnancy was planned in 281 (58%) cases. Only 279 (57%) women had taken folic acid supplements before or during the current pregnancy. One hundred (21%) took supplements when trying to conceive, 241 (50%) during the first trimester, and 77 (16%) beyond the first trimester.

On univariate logistic regression analysis, failure to use folic acid supplements was significantly associated with gravidity (P < 0.001), unplanned pregnancy (P < 0.01), and younger age (P < 0.05). Sixty-five per cent of nulligravida women took folic acid supplements at some point, compared with 49% of women...
who had had previous pregnancies. Similarly, 49% of women with unplanned pregnancies were taking folic acid supplements, compared with 63% of women with planned pregnancies. Only 49% of women in the lowest quartile for age (≤ 25 years) took supplements at some point, compared with 63% of women in the highest quartile (≥ 33 years). Socio-economic deprivation was not significantly associated with the use of folic acid supplements at any stage of the pregnancy.

On multivariate logistic regression analysis, age, gravidity, and planned pregnancy remained significant independent predictors of the use of folic acid supplements, both preconception and during the first trimester (Table 1). As with univariate analysis, deprivation was not significantly associated with the use of supplements.

Of those who did not take folic acid supplements at any stage of pregnancy, 88 (43%) did so because of lack of knowledge regarding the potential benefits, 26 (13%) because they did not feel it was necessary, two (1%) because they felt it was too expensive, and 12 (6%) because they were advised not to take them. Data were lacking to confirm whether those advised not to take folic acid supplements were on anti-epileptic medication. When asked about their understanding of when folic acid supplements should be taken, 319 (66%) women knew that supplements should be taken when trying to conceive and 332 (68%) that they should be taken during the first trimester. Seventy-eight (16%) thought that folic acid should be taken beyond 12 weeks' gestation, and 17 (3%) thought that it was contraindicated during pregnancy.

When asked how they had been made aware of the potential benefits of taking folic acid supplements, the most commonly cited sources of information were the woman's general practitioner (GP), magazines, and books (Table 2). Preconception use of folic acid supplements was more common among those who had heard about it through mass education sources, such as television (48%), magazines (46%), or books (42%), than among those who had obtained information through individual professionals, such as midwives (35%), obstetricians (31%), GPs (30%), and health visitors (26%). This trend was reversed for folic acid supplement use during the first trimester.

Three hundred and fifty-five (73%) women reported that they would take folic acid supplements during a future pregnancy, and a further 71 (15%) were undecided. When asked whose advice they would seek regarding the use of folic acid supplements during future pregnancies, 70% indicated their GP, 29% their midwife, 17% their obstetrician, 18% their health visitor, 16% their community pharmacist, and 9% the family planning clinic staff.

Discussion
In this study, only 57% of women had taken folic acid supplements at some point during the current pregnancy. As with previous studies, failure to take supplements was more common before conception, with only 21% of all women taking folic acid supplements during this period. This is much higher than the figures of 2–3% reported in some earlier studies, but similar to other recent results. However, it still suggests considerable scope for improvement.

Awareness of the potential benefits of taking folic acid supplements was poor. One third of all women did not know that they were beneficial before conception and during the first trimester, and nearly half of those who did not take folic acid supplements cited lack of awareness as the reason. Whether increased awareness accounted for the higher use demonstrated in older women can only be speculated. The regression analysis confirmed that age was an independent association rather than merely reflecting a higher proportion of planned pregnancies in older women, as suggested previously. Women who had had previous pregnancies might be expected to have higher levels of awareness but nonetheless had lower rates of use. It is possible that the effect of increased awareness was offset by the reassuring effect of previous normal pregnancies. Other authors have cited cost as a potential factor and suggested that folic acid supplements should be available free of charge. However, cost was reported as a reason for not taking supplements in only 1% of women in our study.

Information conveyed through professionals appeared to exert some influence on folic acid use during the first trimester, but was less successful at encouraging preconception use, presumably because of poorer access to women at this stage. Mass education through television, magazines, and books has a greater potential to reach the female population before conception, and it has been suggested that advertisements targeted at the general population would be a more effective form of health education. Nonetheless, a high proportion of women reported that they

Table 2. Sources of information on folic acid supplement use reported by pregnant women.

<table>
<thead>
<tr>
<th>Source</th>
<th>No. (%) women</th>
</tr>
</thead>
<tbody>
<tr>
<td>General practitioner</td>
<td>221 (45%)</td>
</tr>
<tr>
<td>Magazine</td>
<td>123 (25%)</td>
</tr>
<tr>
<td>Book</td>
<td>102 (21%)</td>
</tr>
<tr>
<td>Free pregnancy booklet</td>
<td>93 (19%)</td>
</tr>
<tr>
<td>Midwife</td>
<td>74 (15%)</td>
</tr>
<tr>
<td>Obstetrician</td>
<td>52 (11%)</td>
</tr>
<tr>
<td>Television/radio</td>
<td>46 (10%)</td>
</tr>
<tr>
<td>Family member</td>
<td>50 (10%)</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>34 (7%)</td>
</tr>
<tr>
<td>Health visitor</td>
<td>23 (5%)</td>
</tr>
</tbody>
</table>

Table 1. Factors associated with the use of folic acid supplements on multiple logistic regression analysis.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Any time OR (95% CI)</th>
<th>Before conception OR (95% CI)</th>
<th>First trimester OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.06 (1.02–1.11)b</td>
<td>1.09 (1.05–1.14)b</td>
<td>1.08 (1.04–1.13)c</td>
</tr>
<tr>
<td>Deprivation category</td>
<td>0.98 (0.87–1.10)</td>
<td>0.95 (0.85–1.07)</td>
<td>0.92 (0.81–1.03)</td>
</tr>
<tr>
<td>Gravidity</td>
<td>0.70 (0.57–0.87)b</td>
<td>0.68 (0.55–0.83)c</td>
<td>0.61 (0.49–0.77)d</td>
</tr>
<tr>
<td>Planned pregnancy</td>
<td>1.58 (1.05–2.39)c</td>
<td>77.81 (51.47–117.64)d</td>
<td>1.97 (1.29–2.99)b</td>
</tr>
</tbody>
</table>

*aP < 0.001; bP < 0.01; cP < 0.05; dP < 0.0001.
would prefer to discuss future use of folic acid supplements with their GP. Therefore, this should not be overlooked as a means of educating women on the benefits of folic acid supplement use during a current or future pregnancy. In particular, GPs and family planning staff have an opportunity to improve folic acid supplement use among primigravida women through the education of women seeking family planning advice.

Health education through any of these means can only improve uptake among women with planned pregnancies, who constituted only 58% of our study sample. This figure is lower than that quoted in other published studies. Not surprisingly, use of folic acid supplements was significantly lower among women with unplanned pregnancies. It has been suggested that uptake could be improved in these women through food additives, which would increase folic acid uptake among the population as a whole. Such a strategy would lead to much higher folic acid intake among all pregnant women, but particularly among those with unplanned pregnancies, who are less likely to use supplements. Analogies have been drawn with immunization against infectious diseases. These comparisons are somewhat fallacious in that, unlike immunization, there is no scope for ‘herd immunity’, whereby one individual can gain protection by another person’s uptake. However, there is no evidence that the population not at risk of pregnancy would be exposed to serious adverse effects from taking folic acid supplements unnecessarily.

Furthermore, this group could potentially benefit through a reduced incidence of other diseases associated with folic acid deficiency. Clearly, any initiative to introduce food additives should be viewed as supplementary to attempts to improve dietary intake among the population as a whole.

Time trend studies have demonstrated a 46% reduction in the pregnancy prevalence of NTDs between 1964 and 1988, compared with a 82% reduction in the birth prevalence. This suggests that half of the reduction in birth prevalence can be attributed to antenatal screening. Genetic counselling and socio-economic and demographic trends may also have played a role. However, these factors in isolation are unlikely to account for the magnitude of the trend observed. Therefore, it has been suggested that trends in folic acid intake may also be a contributory factor. Since the reduction in prevalence predates recommendations on the use of folic acid supplements, improvements in dietary intake may also have contributed to the observed reduction in NTD birth prevalence.

Compared with earlier studies, our study suggests that folic acid supplement use has increased, but there is still considerable scope for improvement. Improved health education through health care professionals and mass media routes should be used to improve uptake among women with planned pregnancies, but uptake among those with unplanned pregnancies will only be substantially improved through strategies that increase uptake of folic acid among the population as a whole. Strenuous efforts should be made to improve the dietary intake of folic acid but consideration should also be given to the use of food additives.

References

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Address for correspondence
Dr J Pell, Department of Public Health, Greater Glasgow Health Board, Dalian House, PO Box 15329, 350 St Vincent Street, Glasgow G3 8YZ.

University of Wales College of Medicine
School of Postgraduate Medical and Dental Education
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