

SEHB FOLIC ACID SURVEY

REPORT

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INTRODUCTION

In recent years research has shown that the risk of recurrence and first occurrence of neural tube defects (NTD) can be greatly reduced by increased intake of folic acid before pregnancy. In 1992, the Public Health Service in the United States¹ recommended that all women who are capable of becoming pregnant should consume 400mcg of folic acid daily. Similar recommendations were made by the UK Department of Health.² In 1993, the Irish Department of Health informed health boards and general practitioners of the importance of folic acid in the prevention of NTD; it also published leaflets for the public on folic acid including advice on food sources rich in folic acid. Since then, there has been concern that few women of childbearing age are aware of these recommendations. Studies in the United States³ and the UK⁴ in the early 1990's showed low knowledge and uptake of folic acid peri-conceptually. A similar situation prevails in Ireland where studies^{5,6,7} have shown peri-conceptual use of folic acid as low as 5%. These findings have led to debates in many countries including Ireland, on the merits of different methods to increase the peri-conceptual use of folic acid including mandatory fortification of staple foodstuffs with folic acid. This policy has been adopted by the United States.

In 1997, the Food Safety Authority of Ireland commissioned the Health Research Board to undertake a detailed study to assess current knowledge and use of folic acid in Dublin, part of the catchment area of the Eastern Health Board (EHB). A similar study was undertaken in most of the rest of Ireland on a health board basis co-ordinated by the Eastern Health Board with funding support from the Food Safety Authority. The following is a description of the findings of the study for the South Eastern Health Board (SEHB).

METHODS

A cross-sectional survey was undertaken using an interviewer administered questionnaire during a three month period from mid-October 1997 to Mid January 1998. The sampling frame consisted of all women giving birth consecutively in two maternity hospitals in the SEHB during the period. In estimating sample size, a prevalence of 16% for peri-conceptional folic acid uptake among antenatal women in Dublin in 1997 was used, giving a sample size of approximately 200 per health board. It was decided therefore that between 200 and 300 women would be interviewed in each Health board to allow for the variability in

numbers of births and exclusions. Women with a poor grasp of the English language were excluded. Other exclusions were women who had a stillbirth or peri-natal death, or whose child had a major congenital malformation. Mothers who were ill or who were distressed for any reason were also excluded. The interview took place prior to hospital discharge within days of delivery. The questionnaire used was the same as that used in the Dublin study undertaken by the Health Research Board, with the addition of some minor additional questions – feeding intentions, smoking history, alcohol history – of local interest.

Respondents were asked detailed questions on dietary behaviour during the three months prior to conception and in the first three months of pregnancy. They were asked if they had heard of folic acid, the source of the information, if they knew why folic acid was important, whether they were advised to take folic acid prior to pregnancy and by whom, and the timing (in relation to conception) and duration of folic acid or multivitamin intake. Demographic variables examined included age, marital status, planning of pregnancy and number of previous pregnancies. Respondents were also asked if they were holders of General Medical Services (GMS) cards and whether they were public or private patients in the hospital. The data was analysed on an aggregate basis for all health boards combined using Epi Info 6.04a software⁸ by the EHB. SEHB results were analysed using SPSS by the SEHB's own Department of Public Health Medicine.

RESULTS

There were 327 women in the sampling frame to be interviewed. Of these, 92.5% (301/327) were interviewed. The reasons for exclusion were:

Language Barrier	3
Chromosome Abnormality	2
Still Birth/Neonatal Death	4
Maternal Illness	1
Maternal Reluctance	1
Discharged before completion of questionnaire	15

When all questionnaires were aggregated centrally, 47 for the SEHB were mislaid and so were not available for analysis.

1. Demographic and lifestyle profile of respondents

The age range of respondents was 15 - 43 years (median 29 years). Seventeen per cent (43) were single, 68.5% (174) were married, 13.8% (35) were cohabiting and the remaining 0.8% (2) were separated, divorced or widowed. The educational status of respondents is shown in Table 1.

Table 1. Education level of respondents

Education level completed	No	%
No formal education	2	0.8
Primary education	15	5.9
Lower secondary (Junior/Inter/Group cert.)	70	27.6
Upper secondary (Leaving/Technical/Vocational)	97	38.2
Third level (Non-degree/Diploma)	45	17.7
Third level (Degree/Professional)	25	9.8
Total	254	100

Seventy seven per cent (197/253) of respondents were public patients in the hospital; 23% (56/253) were private or semi-private. Regarding GMS status, 33.1% (84/253) were medical card holders and 66.5% (169/253) were non-card holders. Half (127/254) had planned their pregnancy, 39.8% (100/251) were primigravida and 53.8% (135/251) had 1-3 previous pregnancies. The remaining women (16, 6.4%) had 4 -7 previous pregnancies.

Prior to this pregnancy half this group smoked (daily – 113 (44.5%), occasionally 16 (6.3%)). The majority smoked less than twenty cigarettes daily – 77.4% (89) prior to pregnancy, 86.5% (71) during pregnancy. Three quarters (194, 76.4%) of the respondents drank alcohol prior to this pregnancy with a mode of three drinks and one unit of alcohol weekly. During the pregnancy the modal number of drinks was one as was the number of units of alcohol.

2. Dietary changes prior to pregnancy

A minority of women (18/254, 7.1%) reported making changes to their diet prior to pregnancy; 52.8% (134/254) had made changes during the first three months of pregnancy. A number of women commented that they felt there was no

need to change if they were already taking a proper diet. The actual dietary changes made by the respondents are shown in Table 2.

Table 2. Dietary Changes

	Before Pregnancy No.	First 3 mths of Pregnancy No.	First 6 wks of Pregnancy No.
Folic acid level 1 foods:			
Ate more green vegetables, type 1(*)	1	22	18
Ate more breakfast cereals fortified with folic acid	3	44	16
Ate bread fortified with folic acid	2	6	3
Drank milk fortified with folic acid	1	16	7
Folic acid level 2 foods:			
Ate more green vegetables, type 2 (**)	10	74	39
Ate more kidney, yeast and beef extracts	2	11	3
General diet:			
Ate more fruit or vegetables NOS, vegetables not type 1 or 2 listed above	13	84	39
Ate more foods rich in calcium (***)	6	74	40
Drank less alcohol	4	66	39

* (asparagus, sprouts, spinach, kale)

** (broccoli, cabbage, cauliflower, peas, beansprouts, iceberg lettuce, parsnips)

*** (milk, cheese, yoghurt)

3. Knowledge of folic acid

Almost all respondents (95.3%, 241/253) had heard of folic acid. The majority, 95.5% (218/219) thought that in relation to pregnancy women should take more folic acid. Only one respondent felt women should take less folic acid. Data was available for two hundred and eight respondents on their knowledge of the folic acid neural tube defect (NTD) link. Almost four fifths (166/208, 79.8%) knew of the link. When they first found out about this link is shown in Table 3.

Table 3. Time of first finding out about folic acid neural tube defect link

	No	%
Longer than 3 months before this pregnancy	123	73.7
Less than 3 months before this pregnancy	8	4.8
At the time of the pregnancy test	16	9.6
At first visit to GP after pregnancy test	19	11.4
At first hospital ante-natal clinic	1	0.6

Total	167	100
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The respondents' first sources of information about this link are shown in Table 4. The GP was the main source followed by friends/family and the media. Magazines were cited as the most frequent media source at 11.4% (19/166), followed by television (8/166, 4.8%), and radio (3/166, 1.8%).

Table 4. First sources of information about folic acid

	No	%
GP	61	36.7
Friends/family	36	21.7
Media	30	18.0
Leaflet/brochure/poster	18	10.8
Chemist/Pharmacy	5	3.0
School	5	3.0
Hospital doctor	3	1.8
Other	8	4.8
Total	166	100

(*Other: Midwife at ANC = 1, Health Board = 2, Spina Bifida Association = 1, Own Profession/Study = 4)

For those women who first learnt of the link between folic acid and neural tube defects in the pregnancy just completed, the stage at which they were at in the pregnancy ranged from 2 – 16 weeks with median and modal values of 6 weeks.

4. Advice to take folic acid

Respondents were asked whether and when they were advised (or not) to take folic acid before pregnancy. Less than half (104/252, 41.3%) had been so advised before they became pregnant, 39.7% (100/252) had been advised after becoming pregnant while almost one fifth (48/252, 19.0%) said they had never been advised to take folic acid prior to pregnancy. The respondents main sources of advice are shown in Table 5.

Table 5. Main sources of advice to take folic acid before pregnancy

Advise Given by	Number	%	Advise Given By	Number	%
GP	169	34.1	Television	17	3.4
Chemist/Pharmacy	11	2.2	Magazine	50	10.1
Hospital doctor	22	4.4	Newspaper	4	0.8
Family planning clinic	3	0.6	Leaflet/Brochure	57	11.5

Antenatal clinic	36	7.3	Poster	16	3.2
Antenatal class	6	1.2	Pre-marriage Course	-	-
Public health nurse	1	0.2	School	2	0.4
Health Board	2	0.4	Food industry	6	1.2
Friends	56	11.3	Dietitian/nutritionist	3	0.6
Family	25	5.1	Spina Bifida Association	-	-
Radio	9	1.8	Other (*)	4	0.8
			Total (**)	495	

*(read it somewhere = 2, own profession/study = 2)

**(*Respondents were allowed to tick a maximum of three sources*)

Sixty four women who knew of the folic acid - NTD link before pregnancy but had not taken folic acid before this pregnancy nor during the first 12 weeks of this pregnancy; 63.1% (41/64) said it was because they had not planned their pregnancy, 12.3% (8/64) didn't bother or think it was necessary. The remainder cited other reasons.

5. Use of folic acid

Respondents were asked about folic acid/vitamin/supplement use in the three month period before this pregnancy (Table 6). Less than one third (75/254, 29.5%) had taken folic acid or multivitamin or either of them sequentially (multivitamin followed by folic acid). In the first three months of pregnancy, 75.6% (192/254) had taken supplements containing folic acid (Table 6).

Table 6. Use of folic acid before pregnancy and during the first three months of pregnancy

Supplement	3 mths before		First 3 months	
	N	%	N	%
Folic acid (FA) tablets	65	(25.6)	136	(53.5)
Multivitamin/iron preparation with FA	10	(3.9)	39	(15.4)
Sequentially: multivit-folic acid/folic acid-multivit	-		14	(5.5)
Together: both folic acid and multivitamin with FA	-		3	(1.2)
Other preparation not containing folic acid	1	(0.4)	2	(0.8)
Took no supplements/preparations	178	(70.1)	60	(23.6)
Total	254		254	

Respondents were asked to indicate as precisely as possible the weeks in the three months prior to this pregnancy and the first three months of pregnancy during which they were taking folic acid / multivitamin containing folic acid. As shown in Table 7, 22.8% of women took these supplements 13 weeks before their pregnancy. This rose to over 75% twelve weeks after conception.

Table 7. Proportion of Women taking Folic Acid peri-conceptually

Weeks Before LMP	No	%		Weeks after LMP	No	%
>13	57	22.4		1	77	30.3
13	58	22.8		2	77	30.3
12	60	23.6		3	85	33.5
11	62	24.4		4	98	38.6
10	63	24.8		5	116	45.7
9	63	24.8		6	148	58.3
8	68	26.8		7	167	65.7
7	69	27.2		8	186	73.2
6	69	27.2		9	189	74.4
5	69	27.2		10	190	74.8
4	74	29.1		11	190	74.8
3	74	29.1		12	191	75.8
2	75	29.5		13	184	72.4
1	75	29.5		>13	178	70.1

Of those who reported taking supplements during pregnancy, 93.7% (179/191) took them every day of the week. 96.3% (184/191) reported taking only one tablet/capsule each day.

6. Sub-Group Analysis

6.1 Planned Pregnancy: Those who had planned this pregnancy were more likely, than the other respondents to have changed their diet before this pregnancy, and in the first three months of this pregnancy. They were also more likely to have heard of folic acid, to have heard of it before this pregnancy (> 3months or 1-3 months before), to have been advised to take folic acid before pregnancy before this current pregnancy and to have taken folic acid/vitamins/supplements in the three month period before pregnancy and the first three months of pregnancy. All of the above were statistically significant ($P < 0.05$).

Other factors about those respondents who planned this pregnancy which reached statistical significance ($P < 0.05$) were that they were more likely to be married/cohabiting, not to have medical cards, to have had private/semi-private care, to have had previous pregnancies and to have been non smokers prior to this pregnancy

6.2 Previous Pregnancies: When those who had previous pregnancies were compared with those for whom this had been a first pregnancy, the factors associated at a statistical significant level ($P < 0.05$) with the former group were:

- When they had first heard of the link between folic acid and neural tube defects - before pregnancy versus at time of pregnancy test, GP visit, ANC, and
- Knowledge of when women should take folic acid – before pregnancy.

Factors not associated with whether a respondent had a prior pregnancy were whether they had heard of folic acid, the link between folic acid and neural tube defects, at what stage of this pregnancy they started taking folic acid, and whether they had been advised on folic acid.

Compared with those who had previously been pregnant, those for whom this had been a first pregnancy were less likely to have planned the pregnancy, more likely to be single and more likely to have both smoked and drank alcohol prior to this pregnancy.

6.3 Education: The two groups compared here were whose formal education had stopped at junior/group/intermediate certificate and those who had completed secondary school and/or third level. At a statistical significant level ($p < 0.05$) the latter group were more likely to have heard of folic acid, to know that women should start taking folic acid before pregnancy and to have been advised about folic acid. They were also more likely to plan to breast feed, less likely to have smoked prior to this pregnancy, less likely to be single, less likely to have medical cards and more likely to have had private/semi-private medical care.

6.4 General Medical Eligibility: Those who did not have medical cards were more likely to have heard of folic acid, to know of the folic acid neural tube defect link, to have heard of it prior to pregnancy, to have been advised to take folic acid prior to pregnancy and to have started folic acid prior to this pregnancy.

Non medical card holders at a statistically significant level were less likely to have smoked prior to this pregnancy, were more likely plan to breast feed, to be married/co-habiting, to have planned this pregnancy, and to have completed their formal education at least to Leaving Certificate level.

(7. Feeding Intentions

Two thirds (167) (66%) of the respondents intended to bottle feed their babies, 84 (33.1%) to breast feed, while two (0.8%) had unsuccessfully tried breast feeding. Of those who intended to breast feed the planned duration was 1 – 24 months with a mode and median of three months. Four fifths (208, 81.9%) had been advised on breast feeding. Their sources of advice (*) are shown in Table 8.

Table 8. Sources of Advice on Breast Feeding

	No	%
Midwife at AN Clinic	168	66.1
Friend	81	31.9
Partner/spouse	78	30.7
Their own mother	70	27.6
Consultant at AN Clinic	58	22.8
GP	57	22.4
PHN	43	16.9
School	38	18.0
Other	8	3.8

(*The word advice was used loosely. It must be noted that some of the sources depended on which type of maternity service the mother had opted for).

The profile of mothers who intended to breast feed their babies as opposed to bottle feed at a statistically significant level (p<0.05) was:

Demography: Respondents who were married/co-habiting, non GMS card holder, private/semi-private care, formal education completed at Leaving Certificate level or higher).

Lifestyle: Respondents who were non smokers prior to pregnancy and either a non or occasional drinker prior to this pregnancy.

Folic Acid History: These respondents were more likely to know when women should start folic acid, to have started folic acid prior to or early in this pregnancy and to have been advised to take folic acid prior to pregnancy.

Pregnancy/Feeding Advice History: Intention to breast feed was not associated at a statistically significant level with a history of previous pregnancies nor with the current pregnancy being a planned pregnancy. Planning to breast feed was not associated with having been advised about breast feeding nor with various sources of advice except for those who were advised by their mothers, their partners and their friends.

DISCUSSION

This study was undertaken to give a national picture of folic acid knowledge and use. This health board undertook the study in its own maternity hospitals using its own resources, as funding was retrospective. There were time restraints due to the necessity of carrying out the study as near as possible to the time of the Dublin folic acid study. Efforts were made to ensure as high a degree of standardisation as possible within the health board in the co-ordination and the administration of questionnaires.

The demographic profile of respondents was as expected in terms of the age of respondents and marital status. The proportion of GMS card holders was similar to that nationally and the proportions who had planned their pregnancy and were primigravidas were similar to previous studies^{6,7,9}.

There was a high level of folic acid knowledge overall with a high proportion of respondents having heard of folic acid. Knowledge of the link between folic acid and neural tube defects while less well known was still relatively high. It is important to inform women why they need to take folic acid during their child-bearing years. As in previous studies^{6,7,9,10}, the general practitioner, the media and family/friends were the main sources of information. Almost half of respondents reported being advised to take folic acid before becoming pregnant which was higher than reported in a smaller but similar study⁹ of pregnant women attending ante-natal clinics in Dublin maternity hospitals in 1996 and 1997. However, it is still unacceptably low.

A tiny minority changed their diet – and not all changed to a folic acid richer diet – either before or during pregnancy. This suggests that in the short term and on its own, encouraging a more folic acid rich diet from natural sources will not greatly increase the intake of folic acid prior to and in early pregnancy.

When the dietary change figures are compared with the numbers taking folic acid supplements by the end of the first trimester it would suggest that a strategy aimed to extend this latter behaviour of folic acid supplement use to the pre-pregnancy period would have greater effect.

Less than one third of respondents took folic acid tablets or multi-vitamin supplements containing folic acid in the three months prior to and in the initial weeks of pregnancy. This confirms the difficulties to date in promoting peri-conceptual folic acid intake and in part reflects the fact that planning a pregnancy is an important element in determining women's intake of folic acid. By the end of the first trimester of pregnancy, almost all women were taking folic acid, suggesting no inherent barrier to folic acid in relation to pregnancy.

The sub-group analyses help to illustrate the heterogeneity of this population and therefore the need to tailor the method to increase folic acid intake by the different groups and to evaluate what is and is not effective.

(While the focus of this study and report was and is on folic acid knowledge and use, the findings on smoking behaviour and feeding plans warrant comment. Half the group were smokers prior to pregnancy and relatively minor changes in smoking behaviour occurred during the pregnancy. In addition to the effects on maternal health, foetuses/babies exposed to smoke start out in life at a dis-advantage. On the plus side these are women who for approximately nine months are in regular contact with health services and as evident by their use of supplements during pregnancy are open to changing their behaviour for the sake of their child. Many programmes have been tried to support and encourage pregnant women to quit smoking (and women in the child-bearing years to resist and quit the habit). More work, including locally, is needed.)

(Not all respondents felt they had been advised about breast feeding. Breast feeding advice per se was not associated with respondents planning to breast feed. However, advice from “significant others” (mothers, partners, friends) appeared to make a difference in whether or not a woman planned to breast feed. If the rate of breast feeding is to increase a strategy is needed which will both encourage these

“significant others” to support breast feeding and which will enable health care workers to learn from them (the “significant others” and mothers) what supports are most useful.)

CONCLUSIONS

The reduction in prevalence of neural tube defects in recent years is welcome. However, the birth of a child with such a defect remains a tragedy for the individual and their family. This is all the more so when a number of these defects are relatively easily preventable. A new approach is needed which allows for the heterogeneity of the child-bearing population, which addresses the current inequities around folic acid and which takes cognisance of the knowledge behaviour paradox.

RECOMMENDATIONS

To achieve the aim of all women in the South Eastern Health Board, prior to conception, ingesting 400mcg of folic acid daily, the following are recommended:

- It is recommended that the National Strategy, when published, be implemented by the SEHB and that this is evaluated on an on-going basis.
- It is recommended that a comprehensive database for congenital anomalies, physical and mental disabilities is developed at a regional level in the SEHB.
- It is recommended that each individual and their families, including those with neural tube defects, on the above databases receive appropriate services.
- It is recommended that as part of an on-going campaign, national and local media sources, carry advertisements, articles and inserts on folic acid.
- It is recommended that as part of an on-going campaign, that all health care workers avail of opportunities to remind and inform women in the child-bearing age group of the importance and relevance of folic acid.
- It is recommended that the provision of an information leaflet about folic acid with all home pregnancy test kits be explored with pharmacists within the SEHB and at a national level.
- It is recommended that folic acid’s importance is addressed as a specific topic, during ante-natal care, at the 6 week post natal check, by the Public Health Nurse at her home visit and at the nine month developmental check.

- It is recommended that further research of a qualitative nature is carried out with women who took and did not take folic acid in the peri-conceptual period and also with those women who had previous pregnancies and been , at least in theory, to the folic acid message and implementation of the findings of this research.
- It is recommended that research of a similar nature is carried out with women who planned their pregnancy.
- It is recommended that as part of a population approach that women's groups, places with a high percentage of female employees (including the SEHB), secondary schools and third level institutions are targeted with information on folic acid.
- It is recommended that in addition to maximising knowledge in the above groups research is carried out on the most effective ways to support the above groups in folic acid 400 mcg per day behaviour (earlier than the current rate of 75% at the end of the first trimester).
- (See paragraphs in discussion section for issues around recommendations on smoking and breast feeding).

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