Awareness and Use of Folic Acid in a Clinic-Based Saudi Pregnant Population

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ABSTRACT

Background: Neural tube defects are amongst the most common birth defects worldwide. Many of the patients in our primary care clinic at King Faisal Specialist Hospital and Research Center Riyadh, Saudi Arabia, were not aware of the importance of folic acid supplementation in the prevention of.

Objective: Our aim was to evaluate current level of awareness, use and understanding of FA supplementation in pregnant Saudi women.

Materials and Methods: This was a questionnaire-based cross-sectional study. Two hundred and fifty four Saudi pregnant women were surveyed. They were asked about the use and benefits of folic acid before and during pregnancy. This information was collected during regular office visits to the Family Medicine Department at our hospital over a period of 1-year. Questionnaires were completed by the physicians at the patient’s initial clinic visit.

Results: 85.4% of the pregnant women were under 35 and 14.6% were over 35. 66% of the studied group started folic acid when they realized they were pregnant; only 22% started before conception. Around 50% of the women gave the correct reason for taking folic acid.

Conclusion: There is a definite need to increase the level of awareness in Saudi ladies of the importance of taking folic acid in the preconception period. This can be done during visits for premarital screening and well-woman checks.

Key words: Folic acid, pregnancy, Saudi population

INTRODUCTION

Neural tube defects (NTDs) are congenital anomalies comprising anencephaly, spina bifida and encephalocele. The defects arise from early disruption of brain and spinal cord development; some of which are incompatible with life. Those who survive may have significant disabilities and impaired quality of life. 1500 babies are born annually with spina bifida in the United States[1] and 300,000 babies are affected by NTDs worldwide each year.[2] A NTD registry was established in Saudi Arabia in 2000, and a total of 579 patients were registered from October 2000 to December 2009. This register contains all patients diagnosed as NTD with no criteria for exclusion in terms of age, sex or nationality. A significant number of mothers of these children did not take folic acid (FA) before conception.
(98%). Only 19% started FA in the first trimester. The majority of the children in the register (54%) could not move around. Only 24% could walk independently. A study in the Lancet in 1991 showed that taking FA preconception reduced NTDs by approximately 78%. Genetic and environmental factors play an important role in their etiology. Approximately 50-70% of NTDs may be prevented by taking FA. Developed countries have reported large reductions in NTDs with the introduction of FA supplementation and food fortification. Mothers taking prenatal multivitamins containing FA have a reduced risk of several congenital anomalies as well as NTDs.

For low risk patients, current recommendations from the National Institute of Clinical Excellence in the UK recommends 400 µg of FA daily, starting before pregnancy, continuing for the first 12 weeks of pregnancy. In high risk patients, that is, those who have had a previous child with an NTD, or for women taking certain anticonvulsants, 4-5 mg is recommended. For those at intermediate risk of an NTD, including those with type 1 diabetes, epilepsy, obesity, a family history of NTDs, those belonging to certain ethnic or religious groups, for example, Sikhs in British Columbia, and those who do not comply with medication or healthy diets, as well as those who take alcohol, use tobacco or recreational drugs, the Society of Obstetricians and Gynaecologists in Canada also recommends that 4-5 mg FA should be started 3 months before pregnancy and continued 10-12 weeks postconception. After this, a mother may switch to a lower dose (0.4-1.0 mg) for the remaining part of the pregnancy and continue during breastfeeding.

In Denmark and China, where national information campaigns were conducted on the use of FA before conception, there was some increased use of FA at the time of the campaigns and a reduction in NTDs and nonsyndromic orofacial clefts.

Studies from Saudi Arabia and Qatar showed that a high proportion of women were not aware of the importance of FA in preventing NTDs. The intake of FA in the periconceptional period was also low.

It was against this background that we decided to find out the use of folic acid (FA) in pregnant Saudi women in a clinic-based setting, and to assess their knowledge of the benefits of FA.

**MATERIALS AND METHODS**

Verbal consent was obtained from consecutive women, who fulfilled the criteria for selection. They were interviewed by the physicians at the Family Medicine clinic at our hospital on week days, between April 2011 and May 2012. The power and sample size calculations were based on Saudi studies in which the use of FA was approximately 12%. Using a 95% confidence interval and a 4% probability error, our sample size was estimated at 254.

This included the pregnant woman’s age (below 35 years or above 35 years). Women over the age of 35 are at a higher risk of congenital anomalies. Also included in the questionnaire were the gravidity status, the level of education (whether elementary, high school or university) and occupation (whether housewife, teacher, student, administrator, healthcare, others), previous child with a NTD, whether FA was started during pregnancy or before conception, how long before conception was FA started, whether FA was taken in previous pregnancies, and if the woman knew the reason for taking FA and when to stop it. The dose of FA used was also included in the questionnaire. Only pregnant women of Saudi origin were included.

The data was analyzed using the statistical software SPSS, version 20 by IBM. Descriptive statistics were done for all variables. All categorical variables were compared by Chi-square test. A $P \leq 0.05$ was taken as significant.

Ethical approval was obtained from the Research Ethics Committee, King Faisal Specialist Hospital and Research Centre, Riyadh, to carry out the study on the awareness and use of FA in a Saudi clinic-based pregnant population.

**RESULTS**

A total of 254 pregnant women attending the primary care clinics at King Faisal Specialist Hospital, for prenatal visits were interviewed by their physicians on the use of FA. All women who participated in our study were Saudis. Other sociodemographic data were obtained from all participants [Table 1]. Of the participants, 216 (85.4%) were aged >35 years, and 153 (60.7%) had a university degree. The majority of women, 167 (66%) were housewives, 25 (10%) were teachers, 26 (10%) worked in healthcare, 17 (7%) in administration and the remainder were students. Seven (3%) mothers had a previous child born with NTDs. The gravidity status showed that 67 (26.5%) of our sample was primagravida and 185 (73.5%) multigravida.

Table 2 shows participants’ attitude toward taking FA. A look at the awareness and knowledge of FA revealed that...
about half the mothers 130 (51.4%) knew the reasons for taking FA, and 128 (50.6%) knew when to stop taking the FA supplements. On the use of FA, 158 (63%) of the women in our study sample had taken FA in previous pregnancies. About 168 (68%) of the women started taking FA when they found out they were pregnant, and only 54 (22%) had started before conception. 20 (8%) of our sample started FA a month before conception, 26 (10%) started 3 months before conception, and only 8 (3%) started 6 months prior to conception. Of those 54 women who had started FA preconception, 26 (48%) had started 3 months prior to conception. The dose of FA taken by the women in our study varied: 167 (74.2%) took 1 mg while about 56 (24.9%) took a dose of 5 mg.

There was no significant association between the level of education or occupation and the use of FA preconception. Moreover, education and occupation were not associated with starting FA during pregnancy. Having a child with a NTD did not influence the usage of FA prior to conception in a subsequent pregnancy. There was no association between starting FA during pregnancy and having a child with a NTD. The age of the woman had no impact on...
whether FA was started preconception or not [Figure 1]. However, age was a significant factor as to whether or not FA was started during pregnancy [Figure 2].

If the women knew the reason for taking FA, they were more likely to start taking it before conception ($P < 0.001$) and stop it at 12 weeks gestation ($P < 0.001$). There was no association between starting FA during pregnancy and knowledge of the reason for taking it. 74 (44.3%) women who started taking FA during pregnancy knew when to stop it, while 93 of them (55.7%) did not know when to stop taking their FA supplements. There was a significant association between starting FA in pregnancy and knowing when to stop treatment ($P < 0.007$). 128 (78.5%) women who started taking FA during pregnancy took 1 mg and 33 (20.2%) took 5 mg. Those who used 1 mg dosage appeared more likely to start it when they became pregnant, that is, there is a tendency toward significance ($P < 0.051$).

**DISCUSSION**

Most of the women in this study were over 35 (85.4%) and the majority had a university degree (60.7%). And although over half the women knew the reasons for taking FA, only 22% started FA in the preconception period, most commonly 3 months before conception. Having a previous child with a NTD, did not influence the usage of FA in a subsequent pregnancy. Younger age groups were more likely to start FA during pregnancy than women aged over 35. This cross-sectional study has given insight into our women’s awareness of FA use and benefits in pregnancy. The findings, however, are not representative of the general Saudi pregnant population because this was a clinic based study in a tertiary hospital. There is, therefore, a need for further studies throughout the kingdom, to look at this issue and examine the barriers to FA consumption in all age groups, particularly in women over 35, since they are at a greater risk of all congenital abnormalities.

In a study in Jeddah, Saudi Arabia, that looked at FA awareness among female college students, a high percentage of educated women (88%) were not aware of the importance of FA in preventing NTDs. Our study showed that there was no association between FA use and level of education or occupation.

A study in Qatar showed that only 20% of pregnant women took FA preconception. This was similar to our study in which 21.5% started FA preconception. A study that looked at the knowledge and use of FA among females attending a Maternity and Children’s Hospital in Al Qassim in Saudi Arabia, revealed that only 4.4% of the studied women had taken FA in the preconceptional period.

The information acquired from this study can assist in improving outcomes in Saudi women of childbearing age. This can be used to develop a FA awareness programme during the premarital health screening. The screening is done several months prior to marriage and would offer critical information to young parents to be, prior to conception. For multi-gravida patients, opportunistic advice on the use of FA could be given at the postnatal visit or when they come for contraception or well-woman checks. The following recommendations from Canada could form the basis of an educational programme: Women of childbearing age should be advised about the benefits of FA and multivitamin supplements during wellness visits (pap visits, birth control renewal) especially if they are thinking of becoming pregnant. Women should be advised to follow a healthy diet. Good dietary sources of FA include fortified grains, spinach, lentils, chickpeas, asparagus, broccoli, peas, brussel sprouts, corn and oranges. Women taking a multivitamin containing FA should be advised to take only one daily dose of vitamin supplement. FA and multivitamin supplements should be free of charge for women planning pregnancy. The vitamin supplementation should begin at least 3 months preconception and continue until 10-12 weeks after conception. After the first trimester and throughout pregnancy and the postnatal period (for 4 to 6 weeks or as long as breastfeeding continues) a multivitamin with FA should be used.

Flour fortification initiatives have been strongly encouraged and implemented in the Middle East region. Flour fortification with FA started in Saudi Arabia in 1997, and the incidence of NTDs has declined from 1.9/1000 (1997-2000) to 0.76/1000 live births (2001-2005). It is important that this continues in the region as significant morbidities are associated with NTDs. A study from the UK has highlighted a recent decline in the use of FA supplementation and this further strengthens the case for continued flour fortification. In the United States, research has shown the cost effectiveness of FA fortification. Reassuringly, studies have not shown a link between high FA consumption and the risk of cancer.

**CONCLUSION**

This study demonstrates the need for improved education of Saudi women on the use of FA. We must target women of child-bearing age at every possible
opportunity, particularly when they attend the clinic for checkups. There is a need for educational programmes and campaigns throughout the Kingdom of Saudi Arabia to inform women about the importance of the use of FA in the peri-conceptional period. This should be done in collaboration with public health and government initiatives to prevent these birth defects, which can lead to severe disabilities and human suffering.

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