RESEARCH ARTICLE

A SURVEY ON THE CONSUMPTION, KNOWLEDGE AND ATTITUDE OF PREGNANT WOMEN TOWARD THE EFFECTS OF FOLIC ACID ON PREGNANCY OUTCOME IN TABRIZ

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Abstract

Objective

While the effects of folic acid are well established in prevention of Neural Tube Defects (NTDs), these diseases have a high prevalence in Iran. In order to encourage folic acid supplement use in pregnancy, it is important to promote the awareness of women of childbearing age regarding folic acid importance in preventing NTDs. The aim of the present study was to study the knowledge and attitude of pregnant women on the effect of folic acid on pregnancy outcome and its use during pregnancy.

Materials and Methods

A questionnaire was completed by 400 women from postnatal and prenatal wards/clinics using random sampling. The questionnaire included questions regarding demographic information, folic acid consumption in pregnancy and the attitude and knowledge of the participants on folic acid supplementation and the source of information on folic acid supplementation.
The questions were aimed at subjects' knowledge of folic acid effects on fetal growth and development and prevention of NTDs and not prevention of anemia. Data was analyzed by SPSS software (ver. 13.5).

Results

About 89.9% used folic acid supplements at some point of the pregnancy and 53.7% knew it was beneficial for the fetus. Approximately, 25% and 34.8% of those who used folic acid believed that it was most useful when taken preconception and during the first trimester, respectively. Only 15.4% knew it could prevent NTDs. The most common information sources for folic acid use were physicians.

Conclusion

Awareness and use of folic acid were most prevalent among Iranian women, especially among educated ones. The results showed areas in which further work could be helpful to improve awareness regarding the benefits of folic acid.

Keywords: Folic acid;pregnancy; knowledge; neural tube defects (NTDs)

Introduction

Folic acid is necessary for DNA (1-3) and RNA synthesis (1, 3) and is critical role in prevention of congenital defects such as fetal NTDs (4-8). Since Hibbard and Smithells' suggestion in 1965 for a link between inadequate maternal intake of folic acid and NTDs in their offspring (9), the efficacy of supplementary folic acid before and during the first trimester of pregnancy has been shown in preventing both occurrence and recurrence of NTDs (10, 11).

The prevalence of NTDs at birth was reported to be 28.7 per 10,000 births in Iran in 1998–2003 (12). The reported prevalence of NTDs in Iran is significantly higher than Texas, Germany, and Quebec (13-15). A study has showed that the prevalence of NTDs in Iran has a significant relationship with maternal serum folate level (16). Since fortifying the grain supply with folic acid in Iran is not a compulsory program yet, and studies have shown that usual nutrition is not sufficient to cover the recommended daily intake of 400 µg of folic acid (17, 18), and we need to tackle this problem elsewhere: improvement of folate intake by vitamin supplementation in women of childbearing age.

As seen before in previous studies (19), (20), in order to encourage folic acid supplement use in pregnancy to prevent NTDs, it is important to promote the awareness of women of child bearing age regarding the importance of folic acid in preventing NTDs and other congenital problems. In doing so, it is necessary to evaluate the level of knowledge in the at-risk population. Previous studies in various countries such as the Netherlands (21-23), India (24), USA (13, 25-32), Ireland (33), Spain (34), Israel (35, 36), Japan (1, 37, 38), China (39) and South Africa (40) have shown different levels of awareness regarding the effects folic acid in preventing NTDs , and the best usage period.

There is limitted research on folic acid awareness during pregnancy in Iran. Therefore, in the present study, we tried to obtain information regarding the knowledge of the pregnant women on the effects of folic acid supplementation on the fetus (specially its effects in preventing NTDs, a prevalent neurological defect in Iran) and the level of folic acid supplementation in Tabriz, northwest of Iran.

Materials and Methods

Data was collected between August 2006 and May 2007 in Tabriz, Iran, using random sampling. Women attending their last prenatal clinic visit or those who were in the antenatal ward after birth were recruited to the study.

According to our university regulations, non-interventional studies do not require ethical committee approval but we presented our study to the directors of the midwifery services of the divisions of obstetrics and gynecology and obtained their permission. The subjects were free in answering the questionnaire or withdrawal from the study at any time. Written information was given to the participants. One of the researchers was present at the time of completion of the questionnaires. Written informed consent was obtained from the participants. Women who did not agree to participate, had complicated labor, delivered babies with congenital malformations, or were too exhausted or difficult to examine were excluded. We also tried our best to protect our participants rights and confidentiality.

Four hundred women from two maternity hospitals, one private and one public, participated in the study. Two hospitals served a mixed population from urban, semi rural and rural areas and were located at two different sites in the city.

An original questionnaire was prepared in Farsi. The questions were divided into the following sections: demographic information, folic acid consumption in pregnancy and the attitude and knowledge of the participants on folic acid supplementation and the source of information on folic acid supplementation. The questions were aimed at mothers› knowledge regarding fetal growth and development and prevention of NTDs. The effects of folic acid on possible maternal anemia were not included in the questions.

SPSS software (ver. 13.5) was used for analyzing data. Chi-square test was used for examining the significant level of data distribution between variables of each question and Student's t-test, Pearson correlations and ANOVA was performed in order to examine the possible relationship between various factors. A significant level of $P < 0.05$ was adopted for all tests.

Results

Out of 427 women attending the two maternity hospitals, 400 were recruited to the study and completed the questionnaire (93.7% participation rate). The participants aged 15 to 44 years old with a mean age of 26.5 ± 4.9 and half of the subjects aged less than 26 years. The age distribution of the participants are seen in Table 1. Of them, 17.3% had university education and 36.8% had high school diploma. About 72.3% lived in the cities and 7.5% reported unsuccessful previous pregnancies. The number of pregnancies ranged between one and

five (2.6 ± 1.1). Only four mothers reported illness in their previous children. Information on number of the previous pregnancies and outcome of the current and previous pregnancies are seen in Table 2.

Out of the 359 participants who used folic acid supplements (Figure 1), 25.07% and 34.82% reported taking folic acid supplements preconceptionally (one month prior to the pregnancy) and during first trimester, respectively. About 54% of the participants knew that folic acid was useful for fetal health, 19.5% reported the preconceptional period as the most important time for folic acid effects on fetal growth and development and 33% reported the first trimester as important in this regard (Figure 2). Out of the 132 participants who reported the first trimester as important for fetal growth and development, 52 reported the preconceptional period as an important time as well. Only 15.4% knew that it could prevent NTDs. While 32.3% of participants reported having no information regarding folic acid effects on fetus, 13% thought that folic acid had no positive effect on fetal growth and development. No one was aware that folic acid could be harmful for fetal growth or development (Figure 3).

Out of the 359 participants who took folic acid preconceptionally or during their pregnancy, 72.8% reported their obstetricians/ gynecologists and 22.2% reported health centers as the recommender of folic acid use. Self-medication or recommendation by media or friends/family members accounted for 2.8%, 1.7% and 1.1 %, respectively. Pharmacists had no role in promoting folic acid use in our participants.

Forty-one women who did not use folic acid during their pregnancy were aged 22 to 37 years (25.4 ± 4.6) with 0 to 4 previous children (1.6 ± 1.1). The women who used folic acid in their pregnancy had a wider age range (15 to 40; 26.3 ± 4.9) with fewer children (0 to 3; 064 ±081) with a pregnancy frequency of 1 to 5 (1.8 ±09). More than half of the women in this group had high school diploma or university education and 73.5% lived in urban areas. About 7% of women reported having children with a physical illness but the type of problem was not inquired. The main recommender of folic acid usage for this group was their doctors or health centers.

There was a significant relationship between the number of pregnancies and the participants' attitude regarding the importance of folic acid supplements for fetal growth and its use either preconceptionally or during pregnancy. Area of residence and the level of the education of the participants had significant effects on the awareness of participants on the necessity of folic acid supplementation during pregnancy and on its consumption. Level of education also had a significant correlation with information regarding the important period of folic acid supplementation but not folate usage. Factors such as participants' age or presence of illnesses in the mother did not have a significant effect on folic acid supplementation or participants' attitude toward its necessity and benefits in pregnancy.

Discussion

It is already known that folic acid supplementation prior to pregnancy and during the first trimester of pregnancy effectively prevents neural tube defects (9-11). Taking 0.4 mg folic acid per day could prevent NTDs. However, its consumption level correlates with the level of awareness in the women of childbearing age.

Compare to similar studies (1, 13, 21-40), a significant number of our participants knew that folic acid was useful for fetal health but a lesser percentage knew it could prevent NTDs. Although about half of our participants knew folic acid was useful for fetal growth, only about half of them reported taking folic acid preconceptionally and about one third reported folic acid consumption during the first 12 weeks of pregnancy meaning that in spite of a relatively good level of awareness among our participants, compliance was low, especially preconceptionally, A previous study in United Arab Emirates showed that 46.4% of the respondents had heard about folic acid and 45.5% of respondents took folic acid in the first trimester but only 8.7% knew that it prevented birth defects (41). In a Croatian study, about 72% of the pregnant women were aware of the benefits of folic acid (42). It is expected that in planned pregnancies, folic acid consumption would be high but despite having 75.53% of the pregnancies as planned, only 14.41% of all women took folic acid appropriately in the Croation study. In the former study, the level of awareness was lower than our study but the supplementation level was higher than our population while in the latter study, had similar level of awareness but a lower level of folic acid

supplementation was noted.

In Iran, there are government health centres in which midwives, nurses and general practitioners cover different medical and health needs of the population. These health centres are distributed in every city and village. One of the services provided in these centres are necessary cares during pregnancy which cover a vast range of services including providing pregnant women with the necessary medications and supplementations such as folic acid and iron supplements. These services are provided free of charge (further information can be found at Eastern Mediterranean Regional Health System Observatory website). Folic acid is also available at a low price in pharmacies. These two sources of folic acid could be the reason for higher usage of folic acid in our participants compared to studies in other countries (19, 22, 33, 35, 41, 43), but there is still area for further educational work.

In previous studies, age (35), race (35, 44, 45), education (41, 44, 45), planned pregnancy (44, 45), presence of NTDs in previous child(ren) (44), receiving advice on folic acid use (prior to pregnancy and postpartum) (44) and religiosity (35) were the factors with significant effects on the attitude of the participants and folic acid supplementation during pregnancy. An increased number of pregnancies and history of consultation with physicians, health providers and midwives could also be other effective factors in promoting women's knowledge regarding pregnancy and fetal growth and therefore folic acid intake. We were able to show that the gravid number was significantly related to the participants' attitude toward the importance of folic acid supplement on fetal growth and its use either preconceptionally or during pregnancy. In a previous study in Iran, Kashani and colleagues included only gravid 1 women into their study (46) and reported lower folic acid usage and lower levels of awareness. We were also able to show that the residential area and level of education had significant effects on the awareness of the participants about the necessity of folic acid supplementation during pregnancy and also with folic acid use. The level of folic acid supplementation was low in participants who lived in rural areas. There was also a significant correlation between information regarding the important period of folic acid supplementation (but not folate usage) and the level of education. The participants with university education correctly identified the time as preconceptionally and the first trimester as the best time for folic acid supplementation. Other factors such as age or presence of illnesses in the mother did not have a significant effect on folic acid supplementation or participants' attitude on its necessity and benefits in pregnancy, similar to Ringel's study (35).

Unlike Croatian and Thai studies (42,47), in which the information for folic acid promotion mostly came from the media and then the physicians, the most influential factors of folic acid use were physicians and health care centers in the present study. In Iran, many women visit their obstetrician/gynecologist regularly and receive advice on medication use. This could be another reason for higher folic acid consumption in Iran. In health care centers (health houses), women receive care prior, during and after pregnancy by specially trained staff including midwives, nurse-midwives or general practitioners.

Our study showed that media only played a very weak role in educating our participants but since media could address a wider range of people, it is necessary to emphasize more on educational programs on radio and television and heath related articles on journals and magazines. These resources could enhance awareness. We also noted that the pharmacists' role was not substantial. One of the most important duties of pharmacists is to provide information to the public including pregnant women. Further work is needed to heighten this important role for pharmacist and to boost the awareness of the public regarding this duty.

Although taking a folic acid tablet per day (0.4 mg) is a simple measure to prevent severe birth defects, it is under-promoted in the media, under-recommended by health care providers and underused by women of childbearing age. Therefore, further effort is required and it is necessary to start early on, probably during premarital counseling or even during high school education. Further counseling programs could increase the level of awareness among this group and increase the consumption of folic acid in the correct time to prevent NTDs, a prevalent but greatly preventable problem in Iran.

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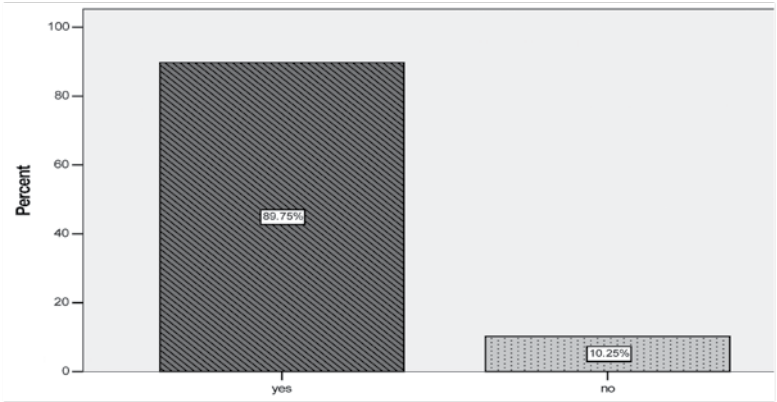

Figure 1. Administration of folic acid by subjects

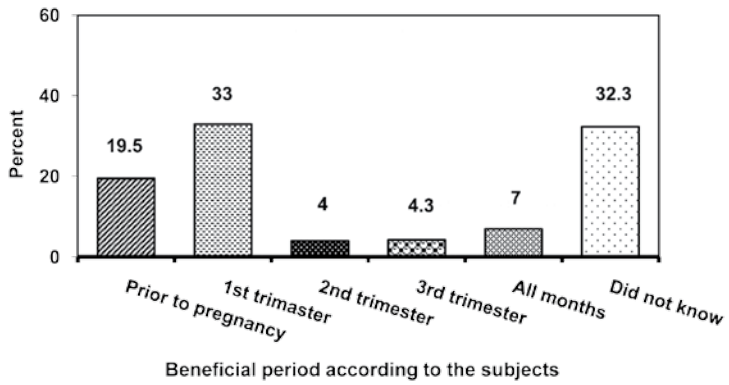

Figure 2. The attitude of the participants toward the best time for folic acid supplementation with respect to pregnancy outcome

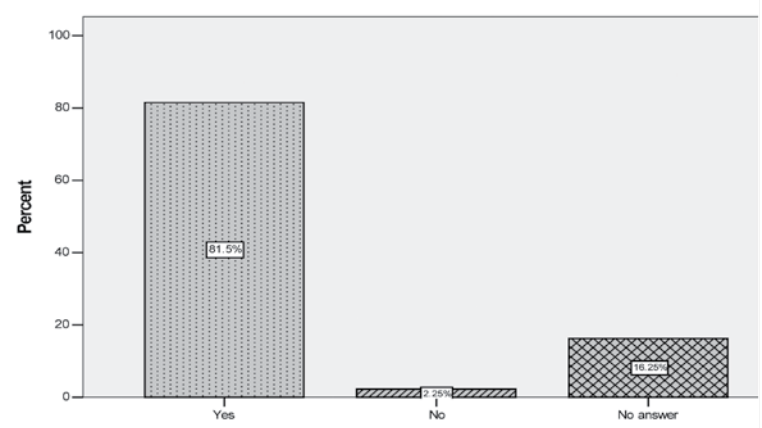

Figure 3. The attitude of the participants toward the necessity of folic acid supplementation during pregnancy

Table 1: Age distribution of the study population

	Age range (years)	Number, %
Subjects' age	15-19	20, 5.0%
	20-24	127, 31.8%
	25-29	160, 40.0%
	30-34	61, 15.3%
	35-39	30, 7.5%
	40-44	2, 0.5%

Table 2: History of previous pregnancies and outcome of the current and previous pregnancies in the study population

Number of previous pregnancies (Number, %)	None	183, 45.8%
	One	118, 29.5%
	Two	69, 17.3%
	More	30, 7.5%
Unsuccessful previous pregnancies	Yes	17, 7.5%
	No	383, 92.5%
Number of previous children (Number, %)	None	200, 50.0%
	One	127, 31.8%
	Two	54, 13.5%
	More	19, 4.8%
History of illnesses in the previous child(ren) (Number, %)	Yes	14, 8.2%
	No	157, 91.8%
History of illnesses in the newborn (Number, %)	No	165, 82.5%
	Yes	9, 4.5%
	Stillborn	8, 4%
	Pre-term	18, 9%

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