Performance of Pregnant Women on Folic Acid Intake

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Received: 19 Feb. 2012; Received in revised form: 18 Oct. 2012; Accepted: 20 Feb. 2013

Abstract-The cause of neural tube defects (NTDs) is multifactorial and in this case folic acid has an important role. Since the neural tube is closed during 21-28 days of pregnancy, most of women are not informed about their pregnancy at this time, and as a result the golden time of folic acid consumption is missed. The aim of this study was evaluating the performance of pregnant women attending to Tehran Women's Hospital in regard to folic acid intake during pre-conceptional period between 2011 and 2012. This cross-sectional study was conducted in 370 pregnant women attending the prenatal clinic of a hospital affiliate to Tehran University of Medical Sciences between 2011 and 2012. Data were collected through interview using a questionnaire. Although 70% of the pregnancies were planned, but 70.5% of pregnant women had not taken folic acid before conception or in necessary time. There was found a significant relationship between level of education, history of abnormalities in children and the number of abortions and taking folic acid before pregnancy (P=0.005, P=0.000 and P=0.000, respectively).

Acta Medica Iranica, 2013; 51(10): 697-700.

Keywords: Folic acid, Neural tube defects, Pregnancy

Introduction

Neural tube defects (NTDs) are a group of structural disorders caused by failure of the neural tube which closes between 21 and 28 days following fertilization (1,2), when the cells of the brain and spinal cord are known as a tube-like structure (3). These defects can include brain, spinal cord, meninges, skull and vertebral column (3) and are a cause of worldwide mortality and morbidity which incidence rate are more than 300,000 new cases per year (4). NTDs result in 41,000 deaths and 2.3 million disability-adjusted life years (DALYS). They comprise one-tenth of the burden of all congenital conditions and constitute the third congenital burden after congenital heart defects and Down's syndrome (5).

The cause of neural tube defects is multifactorial (7) and more than 95% of the defects occur in women who have no previous history of these disorders (7). In the past few decades, many countries have reported a reduction in the prevalence at birth of NTDs (8). In some studies, a decrease of 93% in prevalence of the disease at birth was accounted for diagnostic tests during second trimester of pregnancy and termination of affected pregnancies (34%), the use of contraceptive methods (59%) and the use of folic acid supplements (9).

Folic acid or vitamin B9, also known as folinic acid, folacin and pteroyl-glutamic acid, is essential for nucleic acid synthesis, adenine and thiamine, which are involved in the structure of chromosomal DNA (10). Delay in DNA synthesis may cause a reduction in cell proliferation, and it causes a delay in production and subsequently results in morphological events such as folding and attachment of neural plate (1-18). The role of folic acid was first reported in 1964 (7) and several clinical trials showed that the risk of recurrence and incidence of these abnormalities declined with folic acid supplements before pregnancy (12-15). It is recommended daily intake of 400 micrograms of folic acid before conception and consuming 4 mg in women who have given birth to babies with neural tube defects by United States Public Health Service and Center for Disease Control and Prevention since 1992 (11).

In a study conducted by Rosano *et al*., the number of women found to have started taking folic acid supplements before conception increased from 0.8%–

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6.7% before 1994 to 1%–30.6% after 1994 in the various countries (16). By investigating defects in folic acid metabolism, the benefits of folic acid were identified. Folic acid deficiency has a role in the incidence of abortion, cognitive and developmental abnormalities, orofacial cleft, urinary tract anomalies, preterm delivery, small for gestational age (SGA), etc. (11). Recent evidence suggests taking folic acid which started before pregnancy and continued during pregnancy can reduce the incidence of NTDs by 50%. Because 90-95% of these malformations occur in families with no previous history, use of supplements containing folic acid decreases the risk of a first occurrence of NTDs (2). Unplanned pregnancy may occur in one-third to half of all pregnancies even in families with high income (19,20), and thus complementary policies have had a limited impact on population levels, even on high-income individuals (21). One of the options to ensure less NTDs reports is using folic acid nutrient enrichment at the time of fertilization. There has been increasing interest in this approach and it has recently been implemented in 57 countries. However, the enrichment of the diet is related to the normal diet (norm), for example, enriching flour may be ineffective in some countries of South Asia and Africa, because many families, especially the poor, do not regularly use enriched flour (22). Therefore, according to the importance and role of folic acid in the fetus's health, women should be trained on taking these supplements before and during pregnancy and also special attention should be paid to this issue in care programs during this period.

Materials and Methods

This study is a cross-sectional study and performed in 1390 to determine the consumption of folic acid supplements before and during the first month of pregnancy. Data collection tool was questionnaire and interview method. Sampling Location was Tehran Women's Hospital. Sampling method was simple random sample (SRS) and data analysis was performed using the statistical software SPSS18.

Results

Most pregnant women (85.9%) were in the age group under 35 years. The average age was 28 years old and the most frequent age group was 30 years old. 70.5% of pregnancies were planned and 60.2% of them were not taking folic acid at needed time.

74.3% of women had a high school diploma and 18.4% had university degrees. 65.4% experienced their first pregnancy, 0.87% with no abortion history and (9.2%) had an abortion, (93.8%) had a history of fetal anomaly. 29.5% of them had started taking folic acid prior to pregnancy.

According to this study, there was no significant relationship between increasing age and getting higher consumption of folic acid before pregnancy.

Folic acid intake was raised by increasing the number of abortions; however there was no statistically significant relationship (0.094).

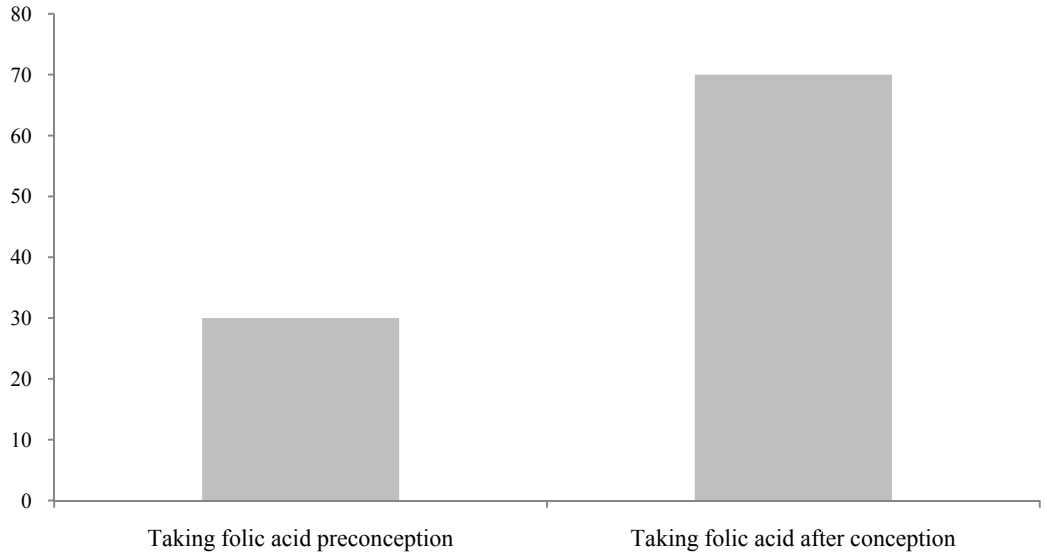

Figure 1. The time of folic acid consumption in pregnant women.

There was a significant relationship between history of a fetal anomaly and the level of education with taking folic acid before pregnancy (0.000, and 0.005).

Discussion

70.5% of women planned their pregnancies, but there was not found any statistically significant relationship between taking folic acid at essential time and planning pregnancy which showed a deficiency in educating women before pregnancy.

A study in Denmark showed that only 22.3% of women with planned pregnancies was taking folic acid before pregnancy and had little difference with those who had been pregnant without planning (23). According to Schader and Corwin study also 44% of women who had planned their pregnancy, only 35% of them were taking folic acid pre-conception and during early conception (24).

In this study, there was a relationship between age and consumption of folic acid before pregnancy, but it was not significant. So that 28% of women under 35 years and 32% of women of the age of 35 years old and older were taking folic acid before pregnancy.

According to the study by Sen *et al.,* taking folic acid prior to conception has been more common in women older than 30 years (25).

There was a statistically significant relationship between folic acid intake before pregnancy with abortion (P<0.000). 26% of women with a history of an abortion and 54% of women with a history of two abortions and 100% of women with a history of three abortions had been taking folic acid before pregnancy. In fact, those who had failed in their previous pregnancy had been seeking more information and more training are given to such clients.

There was a significant relationship between folic acid intake and history of giving birth to a baby with NTDs in themselves or their relatives. So 60% of these patients were taking folic acid at this time. There was a significant relationship between folic acid intake before pregnancy and women's education level (P<0.000). So 69.1% with some college education had been taking folic acid at the essential time. Other studies also showed similar results. It seems that the higher the education, the more awareness of women about taking folic acid, and thus the consumption would be proper. In conclusion, considering the majority of pregnancies is planned and unfortunately, few women are taking folic acid before pregnancy and few women know the proper time of intake. Therefore it is necessary to increase the awareness of women about the benefit and importance of taking folic acid before conception and its effect on pregnancy outcomes.

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