

CLINICAL STUDIES

A Nationwide Program for the Use of Preconceptional Folic Acid to Prevent the Development of Open Neural Tube Defects. Who is Really Using Folic Acid?

ALBERTO DE LA VEGA, MD; EUMARIE SALICRUP, MD; MARIBELLE VERDIALES, MD

A nationwide program directed at stimulating the preconceptional use of folic acid (FA) for the prevention of open neural tube defects has been in effect in Puerto Rico for the last 4 years. To evaluate its effectiveness, 479 questionnaires were distributed among pregnant patients. The average age was 27 (range 14-21), and 64.9% of the pregnancies were unplanned. Preconceptional use of FA was 31.5%, despite 87.7% of patients reporting knowledge about the importance of FA

use. Only 35.4% of patients who had knowledge about FA used it prior to conception. Among patients who planned their pregnancies and knew about the importance of FA, 92/168 (54.6%) used it prior to pregnancy. With these dismal results, we believe these campaigns should re-evaluate their educational strategies and consider reduction of unplanned pregnancies as part of their goals. *Key words: Folic acid, Neural tube defects, Unplanned pregnancies, Educational campaign*

Preconceptional use of FA has been linked to a significant decrease in the incidence of open neural tube defects (1,2). This has lead many countries to support campaigns for the use of FA prior to and during pregnancy. In 1992 the United States Public Health Service recommended that all women of childbearing age consume at least 400 mcg of FA daily. In 1998 the Institute of Medicine reaffirmed that recommendation and added that women capable of becoming pregnant take 400 mcg of synthetic FA daily from fortified foods and/or supplements and consume a balanced healthy diet of folate-rich foods (3).

The beneficial effects of FA use and other preventive strategies have not been consistently documented in all studies (4,5) leaving some doubts about the impact of FA supplementation. This has led to recommendations that further epidemiological studies be done on the subject (6). Irrespective of the merits of such treatments, a nationwide program for the prevention of open neural tube

defects through preconceptional use of FA has been in effect in Puerto Rico for the last 4 years. The purpose of this study was to evaluate the impact this program has had on creating patient awareness about the potential benefits of FA, on modifying patient conduct and achieving the goal of preconceptional FA use.

Materials and Methods

A questionnaire was administered to 479 patients attending their first visit to one of two prenatal clinics from September 1, 2000 through January 31, 2001. Information was obtained concerning prior knowledge about the effect of FA, when and where they received this information, the planning of the present pregnancy, age, parity and use of FA prior to conception. Results were tabulated and compared. Among patients who reported more than one source of information about FA, we only took into consideration the main source.

Results

The results are presented in table I. A total of 479 questionnaires were administered and answered. The average maternal age was 27 years (range 14-21) and the average gravity 2.3. Only 151/479 (31.5%) patients reported preconceptional use of FA. A total of 311/479 (64.9%)

From the Department of Obstetrics and Gynecology, Medical Sciences Campus, University of Puerto Rico, San Juan, PR

Address correspondence to: Alberto de la Vega MD, Department of Obstetrics and Gynecology, Medical Sciences Campus, University of Puerto Rico, PO Box 365067, San Juan, PR 365067, Tel: (787) 754-0101 ext. 2237, Fax: (787) 754-0101 ext. 2236

Table I. Results of Questionnaire Regarding Knowledge and Use of FA Among Puerto Rican Women
N=479

Average age (in years) and range	27 (14-41)
Average gravity	2.3
Preconceptional use of FA	151/479 (31.5%)
Unplanned pregnancies	311/479 (64.9%)
Knowledge of FA prior to pregnancy	420/479 (87.7%)
Use of FA among patients with prior knowledge	149/420 (35.4%)
Prior knowledge, planned pregnancy and use of FA	92/168 (54.8%)
Prior knowledge, unplanned pregnancy and use of FA	57/252 (22.6%)

pregnancies were unplanned. Four hundred and twenty patients (87.7%) reported prior knowledge of the potential effect of FA prior to pregnancy. Of these, 228 (54.3%) reported obtaining this information through the media, friends, family or school, while 192 (45.7%) learned about it through doctors, nurses or other health personnel.

Among the 420 patients who had prior knowledge of FA effects, 149 (35.4%) used it. Among patients who planned their pregnancies and knew about the effects of FA, 92/168 (54.8%) used it while only 57/252 (22.6%) of patients who had knowledge but had an unplanned pregnancy, used FA.

Discussion

The results of this survey are both conflicting and worrisome. We can argue a success in transmitting the information about the potential effects of FA to our reproductive age female population since 87.7% of our patients report having this knowledge acquired from different sources prior to pregnancy. This is a significantly high rate when compared to other Hispanic populations in the United States where as few as 8% of the patients know about FA (7). However, a dismal 31.5% of our patients use FA. An important factor influencing this low FA use is our high incidence of unplanned pregnancies (64.9%). However, other factors must be present since among patients who knew about FA and planned their pregnancies, only 54.8% used it. Although this group had more than twice the rate of FA use than patients who knew about FA but did not plan their pregnancy, it still represents a small group (19%) of the total population. The above data suggests that knowledge about FA does not necessarily lead to increased consumption in almost half of these women. This is consistent with previously published reports even among college students (8).

Analysis of this data would suggest that other approaches such as fortification of various food sources would be a more effective method of supplying FA to our population. The results of this campaign seem to be very limited and would argue against any large reduction in the prevalence of open neural tube defects in our population being attributed as a result of the campaign's success. Any future awareness campaign should consider making the reduction of unplanned pregnancies a main goal in their strategies.

Resumen

Durante los últimos 4 años ha estado en efecto en Puerto Rico un programa nacional para estimular el uso del ácido fólico (AF) antes de la concepción como medida de prevención de los defectos del tubo neural. Para evaluar su efectividad, se distribuyeron 479 cuestionarios entre pacientes embarazadas. La edad promedio fue 27 (rango 14-21), y 64.9% de los embarazos fueron no planificados. El uso pre-concepcional de AF fue 31.5%, a pesar de que el 87.7% de las pacientes reportaron saber sobre la importancia del AF. Sólo el 35.4% de las pacientes que mencionaron conocer sobre el AF, lo utilizaron antes de la concepción. Entre las pacientes que planearon sus embarazos y conocían la importancia del AF, 92/168 (54.6%) lo utilizaron antes del embarazo. A raíz de estos resultados entendemos que las estrategias educativas de la campaña de AF deben ser re-evaluadas, y se debe promulgar entre las mujeres de edad reproductiva evitar embarazos no planificados.

References

1. Honein MA, Paulozzi LJ, Mathews TJ, Erickson JD, Wong LY. Impact of folic acid fortification on the US food supply on the occurrence of neural tube defects. *JAMA* 2001;285:2981-2986.
2. Stevenson RE, Allen WP, Pai GS, Best R, Seaver LH, Dean J, Thompson S. Decline in the prevalence of neural tube defects in a high-risk region of the United States. *Pediatrics* 2000;106:677-683.
3. Knowledge and use of folic acid among women of reproductive age-Michigan 1998. *MMWR Morb Mortal Wkly Rep* 2001;50:185-189.
4. Rosario A, Smithells D, Cacciani L, Bolting B, Castilla E, Cornel M, et al. Time trends in Neural tube defects prevalence in relation to preventive strategies: an international study. *J Epidemiol Community Health* 1999;53:630-635.
5. Suarez L, Hendricks KA, Cooper SP, Sweeney AM, Hardy RJ, Larsen RD. Neural tube defects among Mexican Americans living on the US-Mexico border: effects of folic acid and dietary folate. *Am J Epidemiol* 2000;152:1017-10123.
6. Turner LA, Morrison H, Prabhakaran VM. Do we need another randomized controlled trial on folic acid alone? *Epidemiology* 2001;12:262-265.

7. Perlow JH. Comparative use and knowledge of preconceptional folic acid among Spanish and English speaking patient populations in Phoenix and Yuma, Arizona. *Am J Obstet and Gynecol* 2001;184:1263-1265.

8. Quillin JM, Silberg J, Board P, Pratt L, Bodurtha J. College women's awareness and consumption of folic acid for the prevention of neural tube defects. *Genet Med* 2000;2:209-213.
