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Research Article

TO ASSES PRE CONCEPTIONAL AND ANTENATAL FOLIC ACID CONSUMPTION AMONG REPRODUCTIVE AGE GROUP INDIAN WOMEN

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ABSTRACT

Women in many countries are advised to use folic acid supplements before and early during pregnancy to reduce the risk of neural tube defects in their infants. This study aimed to update the prevalence and to identify possible determinants of preconception folic acid supplement use in Indian women. The present study was conducted in the department of Obstetrics and Gynecology, PES Institute of Medical Sciences &Research, Kuppam. We conducted a cross- sectional study on a sample of 1000 womens who were seen in the medical college. we collected self- reported data regarding socio-demographic characteristics number of prenatal checkups and the use of folic acid during pregnance. Preconception folic acid use was reported by 23.5 % (n = 515) of the participants. Of these, 479 (93 %) women had taken folic acid supplements on a daily basis as recommended by the health authorities. Women who both had intended their pregnancy and had requested a preconception health visit to a doctor/gynecologist were substantially more likely than the reference group to initiate folic acid supplementation before their pregnancy (48.6 versus 4.8 %). Preconception folic acid use was also associated with higher maternal age, higher education, marriage/cohabitation, lower parity, infertility treatments, and chronic disease.Data from seven maternity clinics located in six Indian regions indicate that preconception folic acid supplement use in many Indian women is low. Women who do not plan their pregnancy or do not request a preconception health visit to their doctor have among the lowest prevalence of preconception folic acid use. Improving folate status in these and other supplemental non-users may have important disease preventive effects [1].

Keywords :- Folic acid, indian, Neural tube defects, Predictors, Pregnancy, Supplementation.

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INTRODUCTION

International recommendations have promoted folic acid supplemmentation during preconception period as an effective way of preventing neural tube defects (NTD). However the adoption of this recommendation remains insufficient. To assess awareness and actual intake of folic acid among married women aged 18-45 years, a cross sectional study was conducted among 1000 women selected from our hospital. An anonymous questionnaire was completed which covered measures of knowledge and use of folate supplemments, as well as demographic, socio economic and obstetrical factors. 60% of surveyed women have heard about folic acid. Overall only 6.2% had taken folic acid tablets during the adequate period. Younger age , higher education level and stability/ sufficiency of of income appeared to be significant predictors of awareness among women. Several approches should be used to promote folic acid intake including awareness campaigns, and routine counselling by primay health care physicians on folic acid during preconceptional visits.

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Periconceptional folate is associated with a reduced risk of autism spectrum disorders in the general population.[1,2.]However, no prior studies have investigated whether periconceptional folate supplementation can mitigate the risk of autistic behaviors after AED exposure. Folate supplementation and folate levels during pregnancy are associated with the risk of autistic traits owing to fetal AED exposure.

They used a prospective, population-based cohort and biobank study assessing autistic traits through parental reports with the Modified Checklist for Autism in Toddlers at 18 months of age. All pregnant women should take at least 400 micrograms (mcg)Trusted Source of folic acid daily. Many pre-natal vitamins contain 600 mcg of folic acid.

To become metabolically active , folic acid must first be converted into dihydrofolate(DHF) and then tetrahydrofolate (THF) through enzymatic function, a process catalyzed by the enzyme DHF reductase (DHFR). Thereafter , THF can be converted to the biologically active L- methylfolate by the enzyme methylenetetrahydrofolate reductase (MTHFR).

This conversion is necessary to provide L-methylfolate for the one-carbon transfer reactions(methyl donations) needed for purine/pyrimidine synthesis during DNA and RNA assembly, for DNA methylation , and to regulate homocysteine metabolism. MTHFR is the critical enzyme for almost all biological process that involve the metabolism of folate and methionine.

Background

Health authorities in many countries around the World recommend women of reproductive age to use folic acid supplements before and early in pregnancy to reduce the risk of having a baby with a neural tube defect. The recommendations usually indicate a dose of 0.4 mg folic acid daily from at least one month before pregnancy until the third month of gestation. In addition to such recommendations, a number of countries have also introduced mandatory food fortification of grains with folic acid to increase intake of this B-vitamin in fertile women. In these countries, a risk reduction of neural tube defect has been reported.

Although the prevalence of preconception folic acid supplementation in india has increased after many years of delivered recommendations, a large portion of women still does not follow the recommendations and many start supplementation to late with respect to neural tube defect prevention.

Additionally, the total prevalence of neural tube defects in india has not declined markedly over the years. This has led to a debate regarding the efficiency of folic acid recommendations in india and other countries.

In order to identify groups of women who do not follow the recommendations, many researchers have explored the possible determinants of use or non-use of folic acid supplements. Typically, pregnancy intention, preconception health visit to a doctor, and higher educational level are strong correlates for taking folic acid supplements while higher parity, shorter and longer interpregnancy intervals, maternal smoking before pregnancy, and lower maternal age are often associated with less use.

Such information is valuable and can be used to design intervention programs to improve the preconception folic acid supplement use overall and in subgroups of women related to low use.

In India, the official recommendations from April 2004 state that all women planning a pregnancy and those who do not actively exclude the possibility of becoming pregnant should take a daily folic acid supplement of at least 0.4 mg from one month before conception[4].

Folic acid supplement use

The present study was conducted in the department of Obstetrics and Gynecology, PES Institute of Medical Sciences &Research, Kuppam, A.P. The women were asked to report data on supplemental use of folic acid and other vitamins by specifying the brand name, the frequency of use, as well as the time period of use. In this study, we defined folic acid supplement use as any use of supplements containing folic acid for at least once a week during the following predefined time periods:

- At least one month before the last menstrual period to the end of the first trimester.
- At least six months before the last menstrual period to the end of the first trimester.
- Soon after pregnancy confirmation to the end of the first trimester.
- After the first trimester of pregnancy or
- No use at all.

The main outcome variable under study was preconception folic acid supplement use, i.e., any use of folic acid supplements that had started before the last menstrual period (category (a) and (b) above). Note that our definition of preconception folic acid use differs somewhat from the official recommendations by allowing for a more moderate use as well, i.e., less than seven days a week [3]

Overall, 84 % (n = 1000) of the participating women had taken folic acid supplements at some time point before and/or during pregnancy while only 23.5 % (n = 450) of the participants had reported the use of folic acid supplements before the onset of pregnancy. Specifically, 11.7 % (n = 200) of all women had initiated use, at least, one month before pregnancy, 11.8 %

(n = 159) had initiated use, at least, six months before pregnancy, 54.9 % (n = 101) had initiated after pregnancy confirmation during the first trimester, and 5.6 % (n = 90) reported starting folic acid use after the first trimester of pregnancy .

The prevalence of folic acid supplement users according to time periods of use (n = 2,189). Time periods of use were defined as at least one month before the last menstrual period to the end of the first trimester, at least six months before the last menstrual period to the end of the first trimester, soon after pregnancy confirmation to the end of the first trimester, after the first trimester of pregnancy, or no use at all [5].

Of the 450 women who had initiated use of folic acid-containing supplements before the onset of pregnancy, we had exact folic acid dose information on 475 women (98.2 %). Of these, 71.5 % had taken the usual dose of 0.4 mg, 20.9 % had taken 0.4 mg to 5.0 mg while 7.5 % had taken more than 5.0 mg [6].

Table 1: Characteristics of the study sample

Characteristic		**No. of women**	
		n	***%***
Maternal age (years)			
	<25	65	2.95
	25–29	140	9
	30–34	150	15
	35–39	150	15
	40 or more	50	3.5
Parity			
	0	125	22.45
	1	30	15.2
	2	23	3.2
	3 or more	18	1.9
Educational level			
	Primary school	50	5.5
	Secondary school	90	10.2
Marital status			
	No partner	20	3.4
	Married/cohabiting	150	15.1

Table 2: Prevalence of folic acid supplement users according to maternal characteristics and time periods of usea

Characteristic		**No. of women**	**Folic acid supplement users**			
			At least one month before pregnancy (*n* = 25)	**At least six months before pregnancy (*n* = 20)**	**Soon after pregnancy confirmation (*n* = 610)**	**After the first trimester (*n* = 270)**
Maternal age (years)						
	<25	65	1	0	50	1
	25–29	140	1	2	100	2
	30–34	150	3	2	40	30
	35–39	150	2	1	30	19
	40 or more	50	2	3	30	25

Characteristic		No. of women	Folic acid supplement users			
			At least one month before pregnancy (*n* = 25)	At least six months before pregnancy (*n* = 20)	Soon after pregnancy confirmation (*n* = 610)	After the first trimester (*n* = 270)
Parity						
	0	125	1	0	50	16
	1	30	2	1	30	24
	2	125	2	2	26	36
	3 or more	30		1	14	30
Educational level						
	Primary school	23	1	0	25	5
	Secondary school	18	3	4	60	19
	University	50	4	1	60	30
Marital status						
	No partner	20	2	1	20	13
	Married/cohabiting	150	1	2	65	20

Table 3: Prevalence and association of preconception folic acid supplement according to reported maternal characteristics.

Characteristic		No. of women	No. of supplement users		prevalence ratio
		N	*n*	*%*	*%*
Maternal age (years)					
.	<25d	65	60	0.6	92.3
	25–29	140	138	1.38	98.57
	30–34	150	147	1.47	98
..	35–39	130	128	1.28	98.46
	40 or more	50	40	0.4	80
Parity					
	0	120	118	1.18	98.33
	1	35	34	0.34	97.14
	2	23	22	0.22	95.65
	3 or more	18	17	0.17	94.44
Educational level					
	Primary school	50	48	0.48	96
	Secondary school	90	90	0.9	100
Marital status					
	No partnerd	20	0.2	85	
	Married/cohabiting	70	0.7	94.28	

Table 4: Prevalence and association of preconception folic acid supplement use according to status of preconception health visit to a doctor/gynecologist and status of pregnancy intention.

Preconception health visit	Pregnancy intention	No. of women	No. of supplement users		Prevalence ratio
		n	***n***	***%***	*%*
Nof	Nof	220	14	2.4	6.36
No	Yes	330	48	10.3	14.5
Yes	No	130	18	10.3	13.8
Yes	Yes	320	150	24.3	46.87

DISCUSSION

Our study showed that 84 % of women had taken folic acid supplements at some time point before and/or during the pregnancy but that only 23.5 % of the participants had initiated use before the onset of pregnancy. In general, the percentage of initiation of folic acid supplement use was low before the onset of pregnancy and highest soon after pregnancy confirmation. This pattern was seen in all subgroups of women and suggests that the majority of women acquire folic acid information firstly after the onset of pregnancy. The most important determinants of folic acid use before the onset of pregnancy were preconception health visit to a doctor and pregnancy intention.

This is among the largest studies to examine the prevalence and determinants of maternal preconception folic acid supplement use in Italy. Strengths of the study include the detailed data on frequency, dose, and timing of folic acid supplement use, the analysis of a large number of maternal characteristics as determinants of supplement use, and the multicenter design in which data were collected through seven maternity clinics from six regions in india (three in the north, three in the center, and one in the south). However, our study sample may not be representative of all women giving birth in india. Women who did not comprehend.

The Indian womene, those who delivered before 37 weeks of gestation or had an infant with birth weight below 2,500 g were not invited to participate. In addition, mothers with the lowest educational level may have been underrepresented in our study. As these factors have been related to low use, our study might have overestimated the prevalence of preconception folic acid supplement use. Our prevalence estimate.stillclose to that reported in aprevious study, which was 25.4 % in indian.

Our findings on determinants of preconception folic acid use are generally consistent with those found in numerous other studies. Higher maternal age, having higher education, being married/cohabiting, having lower parity, using infertility treatments, and having a chronic disease have all been identified as statistically significant determinants of preconception folic acid use in previous studies.

In contrast to some findings, we did not identify national citizenship and maternal smoking before pregnancy as significant independent factors after adjusting for covariates. Also, the association of ovulation inductor use was substantially attenuated after covariate adjustments, particularly after adjustment of preconception health visit and pregnancy intention (not shown).

We identified preconception health visit to a doctor/gynecologist and pregnancy intention as the most important determinants of preconception folic acid supplement use. Obviously, women who intend their pregnancy or seek preconception advice from their doctor before pregnancy may be more informed on the benefits and timing of folic acid. Still, only 48.6 % (346/712) of all those who had requested preconception health visit and also had intended their pregnancy were using folic acid before pregnancy (see Table 4).

An explanation for the low proportion of preconception folic acid users in this highly motivated group may be that recommendations on folic acid supplement use were not sufficiently provided to women by their doctors or that, in spite of sufficient information, women forgot or choose not to follow the doctor's advice. These and other specific reasons for not taking folic acid supplements despite pregnancy planning and preconception health visits should be further investigated in studies to gain new insight on how to improve supplement use in these women.

CONCLUSIONS

In conclusion, like many women in other countries, many Indian women start folic acid supplement use too late with respect to neural tube defect prevention. Particularly, women who do not plan their pregnancy and do not request a preconception health visit to the doctor before the pregnancy have among the lowest prevalence of preconception folic acid use. Increased folic acid promotion during preconception health visits combined with an even higher rate of both

planned pregnancies and preconception health visits might help improve supplement use in Italian women. Alternatively, mandatory food fortification with folic acid might be an option for improving folate status, but more information on the overall intake of folate from foods and supplements in Italy is needed before considering such interventions [7].

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