ORIGINAL ARTICLE

PRECONCEPTION AND ANTENATAL FOLATE SUPPLEMENTATION IN WOMEN WITH PREEXISTING DIABETES

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ABSTRACT

***Objectives*:**

The aim of this survey is to evaluate the awareness, understanding, and use of folate in clinical practice.

***Methodology*:**

This was a survey-based cross-sectional study using a predesigned questionnaire. The survey questionnaire was distributed among patients with pre-existing diabetes attending gynaecology and endocrine clinics of Fatima Memorial Hospital, Lahore, Pakistan from July 1, 2022, to July 31, 2022.All women with pre-existing diabetes (both type 1 and type 2) during their first trimester of pregnancy in the study month were included. Women with gestational diabetes were excluded from the study. Data was analysed using Statistical Packages for Social Sciences (SPSS version 20).

***Results*:**

Ninety two per cent of the study participants were unaware of the role of folic acid in the prevention of neural tube defects in pregnancy with diabetes and 46% percent of the participants reported currently taking folic acid supplements. Moreover, 02% of the participants reported that their doctors had discussed the effects of diabetes on pregnancy with them.

***Conclusion*:**

There are significant knowledge gaps among people with pre-existing diabetes about the link of preconception and during pregnancy use of folate supplementation to prevent neural tube defects in babies born to mothers with diabetes.

Key Words: Preconception, diabetes, folate supplementation

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INTRODUCTION

With 537 million adults currently living with diabetes worldwide, the projections indicate a 46% increase to 783 million by 2045. In 2021, 2,460,477.5 live births worldwide were affected by diabetes in women with pre-existing diabetes [1]. The preconception period is crucial for women with diabetes to optimize their glycaemic control and reduce the risk of adverse pregnancy outcomes, including neural tube defects. Folic acid, a B-vitamin essential for DNA synthesis and methylation, has been shown to reduce the risk

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of neural tube defects when taken before and during early pregnancy [2]. However, many women of reproductive age are not aware of the benefits of folic acid supplementation [3]. Major congenital malformations are over two to three times more common in infants of diabetic mothers, potentially influenced by factors such as poor glycaemic control and abnormal folate metabolism, impacting nutrient levels, hormones, growth factors, cytokines, and DNA synthesis/structure. Periconceptional folic acid supplementation has shown potential in reducing anomalies, and deranged folate metabolism has been observed in pregnant women with preexisting diabetes, highlighting the need for further investigation [4-7].

Internationally agreed recommendations for standardized care for women with preexisting diabetes planning pregnancy should include discussion and counselling regarding the increased risk of pregnancy complications associated with diabetes, preconception counselling addressing the significance of achieving an individualized safe range of glycaemic control, ideally less than 6.5% (48 mmol/mol) to reduce the risk of congenital anomalies and other foetal risks, contraception advice, and safe contraception until glycaemic control is optimized. Folic acid at a dose of either 400 or 500 mcg daily should be prescribed and started during the prenatal period. Review of current medications and changing/stopping potentially teratogenic medications, microvascular complication screening with retinal screening, urine microalbuminuria, and renal function tests [8-13].

In Pakistan, there is scarce of data that support use of folic acid in in women with pre-existing diabetes during pregnancy. Therefore, the objective of the survey was to assess the knowledge and use of folic acid supplements in women with preexisting diabetes attending antenatal care, evaluate their awareness of the effects of diabetes on pregnancy, the impact of folic acid supplements in preventing neural tube defects, and determine if these women were using folate supplementation.

METHODOLOGY

This was a survey-based cross-sectional study using a questionnaire. The survey questionnaire was distributed among patients with preexisting diabetes attending gynaecology and endocrine clinics. The questions were designed in a yes or no format for easy understanding and acceptability. The study was conducted at the Gynaecology and Endocrinology outpatient department of Fatima Memorial Hospital, Lahore, Pakistan from July 1, 2022, to July 31, 2022. All women with preexisting diabetes (both type 1 and type 2) attending either gynaecology or endocrinology outpatient department clinic during their first trimester of pregnancy in the study month were included and asked the questionnaire questions.Women with gestational diabetes were excluded from the study.

The study questionnaire aimed to evaluate the awareness and understanding of the study participants regarding the association of neural tube birth defects with diabetes and the preventive role timely supplementation with folate can play in their prevention. The questionnaire also inquired if folate supplementation had been discussed with them by their healthcare professional and whether they are currently taking it. Data was analysed using Statistical Packages for Social Sciences (SPSS) version 20.

RESULTS

A total of 50 participants were included in the study. The baseline characteristics of the study participants were analyzed, revealing a mean age of 28.86±5.21 years. About one-third (34%) of the respondents indicated their academic qualification from matriculation to Bachelor degrees.The mean duration of diabetes among the participants was found to be 2.6±2.39 years (Table 1).

Table 1: Baseline details of study participants

Variables	Mean ± SD or n(%)
Age	28.86±5.21
Education	
No education	2(4)
Primary	5(10)
Middle	7(14)
Matric/O-levels	9(18)
Inter/A-levels	7(14)
Bachelor	18(36)
Master	2(4)
Duration of diabetes	2.6±2.39

Of the 50 participants, 14% were aware of folic acid supplements, 8% were familiar with the impact of folic acid supplements on birth defects. Two percent of the participants reported that their doctors had discussed the effects of diabetes on pregnancy with them. Forty six percent of the respondents reported currently taking folic acid supplements. Ninety two percentof the participants were unaware of the role of folic acid in the prevention of neural tube defects in pregnancy with diabetes and the fact that diabetes increases the risk of neural tube defects in babies (Table 2).

Table 2: Knowledge about folic acid during pregnancy

QUESTIONS	NO n(%)	NO n(%)
Do you know about folic acid supplements?	43(86)	43(86)
Are you familiar with the impact of folic acid supplements on birth defects?	46(92)	46(92)
Have your doctor ever discussed the effects of diabetes on pregnancy with you?	49(98)	49(98)
Do you know diabetes increases the risk of neural tube birth defects?	46(92)	46(92)
Do you know the role of folic acid for prevention of neural tube defects in pregnancy with diabetes?	46(92)	46(92)
Are you currently taking folic acid?	27(54)	27(54)

DISCUSSION

Our study highlights the need to increase both public and healthcare professional awareness and education about the benefits of folic acid supplementation in diabetic mothers during the preconception period and early pregnancy across all sectors of the population, irrespective of their education status. Awareness of folate supplementation and its beneficial effects on pregnancy in our cohort is about 50 percent less than reported in international studies.

Healthcare providers should prioritize the discussion of preconception care, folic acid supplementation, apart from the optimization of glycaemic control with women who are in the reproductive age group and have preexisting diabetes well in advance. Such awareness can translate into better practice of both prescribing and taking folic acid and hence prevent disabling congenital neural tube defects in babies born to mothers with preexisting diabetes [14-15].

Moreover, our study emphasizes the crucial role of healthcare providers in promoting preconception care and discussing the importance of folic acid supplementation with diabetic women well in advance of pregnancy. This proactive approach can significantly reduce the risk of congenital neural tube defects in babies born to mothers with pre-existing diabetes [16].

In addition to its role in preventing neural tube defects, folic acid supplementation during pregnancy has been associated with a reduced risk of other birth defects, such as cleft lip and palate, congenital heart defects, and certain limb defects. Furthermore, adequate folate intake during pregnancy has been linked to improved maternal health outcomes, including a lower risk of preterm birth, preeclampsia, and maternal anaemia.

Moving forward, additional research is warranted to identify the specific barriers to folic acid supplementation in this population and develop targeted interventions to address these challenges effectively. By enhancing awareness and addressing barriers to supplementation, we can improve maternal and fetal outcomes and reduce the burden of congenital anomalies associated with pre-existing diabetes.

CONCLUSION

There are significant knowledge gaps among people with pre-existing diabetes about the link of preconception and during pregnancy use of folate supplementation to prevent neural tube defects in babies born to mothers with diabetes. The healthcare practitioners looking after women of child bearing age either with pre-existing diabetes planning pregnancy or going through pregnancy are either not aware of the scientifically proven benefits of folate supplementation or neither discussing nor prescribing it, which is putting such pregnancies at high risk of neural tube defects.

Limitation of the study: Small sample size is the limitation of this study.

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Author's Contribution

SA:Data collection, interpretation and referencing
SUD:Data collection, interpretation and analysis
AM:Article writing, editing and approved the manuscript
AA:Data collection, and editing

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Introduction: State the purpose of the article. Summarize the rationale for the study or observation. Give only strictly pertinent references, and do not review the subject extensively. Do not include data or conclusions from the work being reported.

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