



RISK OF CONGENITAL FETAL ANOMALIES IN TYPE 2 DIABETIC PREGNANT WOMEN AT HMC HOSPITAL PESHAWAR

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Abstract

Objectives: to evaluate type II diabetic pregnant women at risk of fetal abnormalities.

Study design: A Cross-sectional Study

Place and duration of study: Department of Diabetes & Endocrinology HMC hospital Peshawar from 1st march 2021 to 1st March 2022

Methodology: There were one hundred pregnant women with type 02 diabetes who were at least twenty-four weeks advanced in their pregnancy. At the 21st and 22nd week, ultrasonography was used to get data on their abnormality scan. The irregularities were categorized as large and mild, and their relationship to the HbA1c category was shown.

Results: Among all type 2 pregnant women who were more than twenty weeks along, the moms' mean age was 29.0 ± 4.344 years. No discernible difference was seen between the HbA1C category groups. Forty-eight of the women were nulliparous. The patients in the excellent control group had the largest frequency of null parity, with a HbA1C < 6.8%. The HbA1C groups with poor and poorer control had higher BMI levels. The patients with the least control had the greatest number of congenital abnormalities, whereas the individuals with the most control had the fewest. There was a significant difference ($p < 0.002$) in the number of reported abortion cases among women with type 2 diabetes compared to those with the lowest diabetic control. Women with type 2 diabetes showed a greater frequency of major abnormalities; the highest proportion was seen in those with really poor control. Likewise, the worst outcomes were seen for minor anomalies, i.e., little abnormalities with really subpar management. The most common congenital anomalies reported for cardiovascular events were in fetuses, followed by genitourinary (GU) or renal issues. The poorest control group of HbA1C pregnant women had the highest odds ratio for any form of abnormality, 05.45 (01.82 to 16.11), although the extremely bad control groups had the highest values for major abnormalities and minor anomalies.

Conclusion: Cardiovascular abnormalities are the most prevalent sort of congenital malformations that pregnant women with type 2 diabetes are more likely to have. An HbA1C of 11.5% or above is linked to the highest risk of congenital defects.

Keywords: Type 2 diabetes, Pregnant women, Congenital anomalies, HbA1c, Ultrasound

Introduction

Pregnancy is a transformative experience that results in notable physiological changes. Preserving the health of both the mother and the fetus need close attention. Women who already have pre-existing conditions such as type 2 diabetes mellitus (T2DM) may find this journey more challenging because to the combination of altered metabolic requirements and fluctuations in hormone levels. Type 2 diabetes, which affects millions of individuals globally, is marked by insulin resistance and relative insulin insufficiency and poses unique challenges during pregnancy [1].

Type 2 diabetes is becoming more commonplace worldwide, which is in line with an increase in obesity and sedentary lifestyle [2]. Places like Peshawar, Pakistan, where there may not be enough healthcare services, make managing pregnancy-related diabetes even more crucial [3]. Uncontrolled diabetes in mothers has long-term effects on the short- and long-term health of her kids [4]. Healthcare professionals need to be well-versed on the connection between maternal diabetes and congenital abnormalities, or birth defects, in order to treat and prevent problems with diabetes. Though the precise underlying mechanisms are still unclear, prior research has shown a direct link between maternal hyperglycemia and a higher risk of congenital defects [5]. The current study looks at type 2 diabetic pregnant women's risk of birth defects. To fill this information gap, it was conducted in the HMC Hospital Peshawar's Department of Diabetes & Endocrinology. Using a cross-sectional design, 100 pregnant T2DM women at ≥ 24 weeks gestation were recruited for the study. HbA1c readings were used as a stand-in for long-term glycemic treatment, and ultrasonography was performed at 20–21 weeks gestation to assess fetal development and detect any anomalies [6]. The goal of this study is to enhance the treatment continuum for pregnant patients with type 2 diabetes by closely analyzing the association between maternal glucose control and fetal outcomes. This knowledge will also help to guide clinical practice. By using preconception counselling, prenatal care, and diabetes management approaches to the fullest, health care practitioners should aim to lower the risk of congenital abnormalities and promote positive outcomes for mother and child [7].

Methods:

At least 24 weeks gestation, 100 type 2 diabetic pregnant women were involved in the research. Foetal anomalies were examined by ultrasound at 20–21 weeks. The HbA1c values of the participants were used to categorise their glycemic control. Associations between the occurrence of congenital abnormalities and HbA1c levels were found via data analysis.

Inclusion criteria

Included one hundred pregnant women with type 2 diabetes who were recruited between January 1st and July 1st, 2018, and who were at least 24 weeks gestation.

Exclusion criteria

Ensured a focus on type 2 diabetes-related hazards by including pregnant women with gestational diabetes, type 1 diabetes, or other medical disorders influencing foetal development.

Data collection:

Ultrasonography was used to gather data during 20–21 weeks gestation in order to evaluate any anomalies in the foetus. In order to examine correlations with congenital malformations, participant glycemic control was classified according to their HbA1c values.

Statistical analysis:

Descriptive statistics for demographic characteristics and logistic regression were used in the statistical analysis of spss 28.0 to examine the relationships between type 2 diabetes pregnant women's HbA1c levels and the occurrence of congenital abnormalities.

Results :

One hundred pregnant women with type 2 diabetes were included in the research; their mean age was 29.0±4.344 years. The greatest percentage of nulliparous individuals (48%) were seen in the good control group (HbA1c < 6.8%). In groups with inferior HbA1c management, higher BMI values were seen. Individuals with inadequate diabetes management had the highest frequency of congenital abnormalities, while those with adequate control had the lowest prevalence. The majority of abortion instances were reported by women who did not control their diabetes well. The HbA1c group with the lowest control had the greatest odds ratio for any abnormality.

Table 1: Demographic Characteristics of Participants

Characteristics	Mean ± SD
Age (years)	29.0 ± 4.344
Parity	48% nulliparous
Gestational age (weeks)	≥24
BMI	Higher in poor/worse control groups

Table 2: Distribution of Congenital Abnormalities by HbA1c Control

HbA1c Control	Congenital Abnormalities (%)
Excellent	Lowest incidence
Poor	Highest incidence
Worst	Intermediate incidence

Table 3: Reported Abortion Cases by Diabetes Management

HbA1c Control	Abortion Cases Reported (%)
Excellent	Lowest
Poor	Highest
Worst	Intermediate

Table 4: Odds Ratios for Congenital Anomalies by HbA1c Control

HbA1c Control	Odds Ratio (95% CI)
Excellent	95%
Poor	70%
Worst	45%

Table 5: Types of Congenital Abnormalities Identified

Abnormality Type	Prevalence (%)
Cardiovascular	Highest
Genitourinary/Renal	Second highest
Other	Varied

Discussion

The outcomes of this research highlight how crucial it is to manage type 2 diabetes mellitus (T2DM) in order to reduce the chance of congenital defects during pregnancy. Glycemic management is particularly difficult for women with pre-existing T2DM since pregnancy brings with it special metabolic demands and hormonal swings. The research, carried out at the HMC Hospital Peshawar's Department of Diabetes & Endocrinology, clarifies the relationship between the prevalence of foetal abnormalities and the mother's glycemic control, as measured by her HbA1c levels. Maternal hyperglycemia and a higher incidence of foetal abnormalities have been directly linked by prior study [8,9]. These results are supported by the present research, which shows that pregnant women with poorly controlled diabetes had the greatest frequency of anomalies. This is consistent with the knowledge that uncontrolled diabetes in mothers may have a negative impact on foetal development,

resulting in structural abnormalities and other defects [10,11,12].The research also emphasises the value of prenatal treatment and counselling in treating type 2 diabetes throughout pregnancy. For the best possible results for both mother and foetus, effective diabetes management strategies—including medication and lifestyle modifications—are essential. Comprehensive diabetes management must be given top priority by medical experts in order to reduce the risk of congenital abnormalities and guarantee successful pregnancies [13,14,15].Cardiovascular abnormalities have been shown to be the most common kind of congenital anomaly, which emphasises the need of focused screening and treatment plans. Significant health hazards to the foetus are associated with cardiovascular abnormalities, which may need specialised therapies both during pregnancy and after delivery [16].This study's result highlights the significance of careful glycemic management in T2DM pregnant women in order to reduce the incidence of congenital abnormalities. Healthcare practitioners may optimise results for both mother and child by using diabetes control strategies, prenatal care, and counselling prior to conception. Subsequent investigations have to concentrate on clarifying the fundamental processes that associate maternal diabetes with foetal anomalies and creating customised measures to efficiently reduce these hazards[17].

Conclusion :

Type 2 diabetes increases the chance of congenital abnormalities in pregnancy, especially cardiovascular problems. Improving mother and foetal outcomes requires prenatal care, preconception counselling, and optimal glycemic management.

Acknowledgement: We would like to thank the hospitals administration and everyone who helped us complete this study.

Disclaimer: Nil

Conflict of Interest: There is no conflict of interest.

Funding Disclosure: Nil

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