

# Common Fetal Anomalies in Pregnant Women with Uncontrolled Diabetes

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Fetal Anomalies  
in Pregnant  
Women with  
Uncontrolled  
Diabetes

## ABSTRACT

**Objective:** This research will examine common fetal abnormalities in 132 pregnant women with uncontrolled diabetes to highlight the adverse effects of poorly regulated glucose levels throughout pregnancy.

**Study Design:** A retrospective study

**Place and Duration of Study:** This study was conducted at the Department of Obstetrics and Gynecology from 1<sup>st</sup> June 2022 till 31<sup>st</sup> May 2023.

**Methods:** This retrospective study examined the medical records of pregnant women with uncontrolled diabetes who sought prenatal therapy at Department of Obstetrics and Gynecology from 1<sup>st</sup> June 2022 till 31<sup>st</sup> May 2023. The study involved 132 pregnant women with uncontrolled diabetes. Women with pre-existing diabetes at the onset of pregnancy and poorly treated gestational diabetes were included. Women with well-managed diabetes and inadequate medical information were excluded.

**Results:** The research included a cohort of 132 pregnant women diagnosed with diabetes, with an average age of 28.5 years. The predominant age group among the participants was 30-34 years old, accounting for 34.1% of the total, and their average number of children born was 1.8. Among the women, 60.6% had pre-existing diabetes, whereas 39.4% were diagnosed with gestational diabetes during pregnancy. Most of the abnormalities were classified as mild (31.1%) or moderate (25.8%), with a lesser proportion categorized as severe (15.2%).

**Conclusion:** This research indicated that pregnant women with diabetes had several fetal malformations, mostly cardiac anomalies. A large majority of abnormalities were mild or moderate.

**Key Words:** Uncontrolled diabetes, fetal anomalies, neural tube defects, cardiac abnormalities, glycemic control, prenatal care

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## INTRODUCTION

Diabetes mellitus is a persistent metabolic disease marked by high levels of glucose in the blood. It is a significant worldwide health issue that is becoming more prevalent<sup>[1,2]</sup>. The consequences of diabetes are more significant when it coincides with the critical stage of pregnancy<sup>[3,4]</sup>. Uncontrolled maternal diabetes during pregnancy presents several difficulties and possible problems for both the mother and the growing fetus<sup>[5,6]</sup>.

The embryonic and fetal phases are crucial times characterized by fast development and organ formation, which makes them vulnerable to extrinsic factors such as maternal hyperglycemia<sup>[7]</sup>. This research examines

a group of 132 pregnant women who have diabetes and investigates the frequency of typical fetal abnormalities linked to poorly managed diabetes. Unregulated diabetes during pregnancy is recognized to contribute to a range of problems, including microsomal and newborn hypoglycemia, as well as an elevated risk of congenital malformations<sup>[8]</sup>. The objective of this inquiry is to provide insight into a particular component of this complex situation: the prevalence of typical fetal abnormalities in pregnant women with poorly controlled diabetes.

Healthcare practitioners must have a comprehensive understanding of the various kinds and frequencies of fetal abnormalities in this group in order to improve prenatal care methods and implement specific interventions<sup>[9]</sup>. The results of this research may enhance understanding, prompt identification, and facilitate treatment of fetal abnormalities in pregnancies affected by uncontrolled diabetes.

As we begin this journey, it is vital to highlight the significance of preconception care and the role of maintaining stable blood sugar levels in reducing the risks associated with diabetes throughout pregnancy. Through unraveling the complexities of this connection, our aim is to improve the quality of treatment offered to pregnant women with diabetes, eventually maximizing the results for both the mother and the child.

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**METHODS**

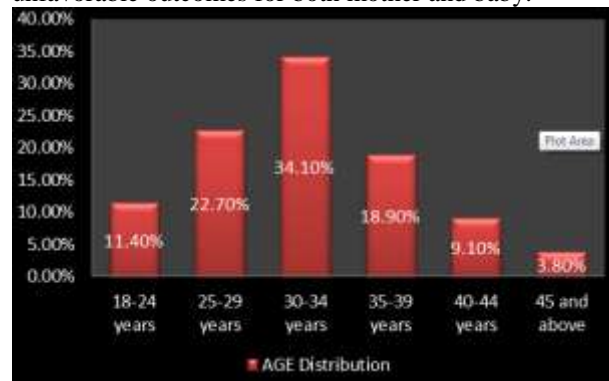
This research used a retrospective study design, examining the medical records of pregnant women with unregulated diabetes who sought prenatal treatment at Department of Obstetrics and Gynecology from 1<sup>st</sup> June 2022 till 31<sup>st</sup> May 2023. The research included 132 pregnant women who had confirmed diagnoses of uncontrolled diabetes. The inclusion criteria included women who had pre-existing diabetes at the start of pregnancy, as well as those who had gestational diabetes that was not well managed throughout pregnancy. The exclusion criteria were women who had well-managed diabetes and those who had insufficient medical information. Data of significance were gathered from computerized and paper-based medical records. The collected information included maternal demographics like as age and parity, diabetes history, details of preconception treatment, measures of glycemic control, and any pre-existing comorbidities. Additionally, the study documented pregnancy outcomes, including both delivery difficulties and neonatal outcomes. The diagnoses of fetal anomalies were determined by using a mix of normal ultrasound screenings and further diagnostic imaging modalities, such as magnetic resonance imaging (MRI) when deemed essential. Information on each abnormality, its level of seriousness, and the age of the fetus at the time of identification were recorded.

**Data Analysis:** The statistical analyses were conducted using the relevant program SPSS, version 26. Maternal features and diabetes treatment were summarized using descriptive statistics. The frequency of various fetal abnormalities was computed and compared to known rates in the whole population.

**RESULTS**

The research included a cohort of 132 pregnant women diagnosed with diabetes, with an average age of 28.5 years. The predominant age group among the participants was 30-34 years old, accounting for 34.1% of the total, and their average number of children born was 1.8. Among the women, 60.6% had pre-existing diabetes, whereas 39.4% were diagnosed with gestational diabetes during pregnancy. Every participant got preconception care, with an average of 10 prenatal visits. During pregnancy, 82.6% of the women used insulin, whilst 17.4% relied on other diabetic drugs. 25.8% of the female population had maternal problems during their pregnancy. The predominant fetal abnormalities seen were cardiac anomalies (24.2%), followed by neural tube defects (15.2%), genitourinary anomalies (13.6%), skeletal malformations (11.4%), and gastrointestinal anomalies (7.6%). Most of the abnormalities were classified as mild (31.1%) or moderate (25.8%), with a lesser proportion categorized as severe (15.2%). The average

gestational age at which fetal abnormalities were diagnosed was 22.6 weeks. The research further revealed that 21.2% of the pregnancies led to premature delivery, while 11.4% of the infants were delivered with a birth weight below 2500g. Neonatal hypoglycemia was seen in 15.2% of the infants. 37.9% of the female population had caesarean section, and there were 2 instances of maternal death. The research shows that pregnant women with diabetes had several fetal malformations, mostly cardiac defects. A large majority of abnormalities were mild or moderate. In this community, premature delivery, low birth weight, and caesarean sections were common, according to the research. These results stress the need of glycemic management and thorough monitoring throughout pregnancy for diabetic women to limit the risk of unfavorable outcomes for both mother and baby.



**Table No. 1: Maternal Demographics and Diabetes History**

Variable	Number of Patients(n=132)	%
Age (years) Mean (±SD)	28.5 (±4.2)	
18-24 years	15	11.4%
25-29 years	30	22.7%
30-34 years	45	34.1%
35-39 years	25	18.9%
40-44 years	12	9.1%
45 and above	5	3.8%
Parity	1.8 (±1.2)	
Pre-existing Diabetes	80	60.6%
Gestational Diabetes	52	39.4%
Preconception Care	100	75.8%

**Table No. 2: Glycemic Control Measures**

Variable	Number of Patients(n=132)	Percentage (%)
HbA1c levels at conception	7.8% (±1.1)	
Number of prenatal visits	10 (±2)	
Insulin use during pregnancy	109	82.6%
Other diabetes	23	17.4%

medications		
Maternal complications	34	25.8%

**Table No. 3: Fetal Anomaly Types and Prevalence**

Fetal Anomaly	Number of Patients(n=132)	Prevalence (%)
Neural Tube Defects	20	15.2%
Cardiac Anomalies	32	24.2%
Skeletal Malformations	15	11.4%
Genitourinary Anomalies	18	13.6%
Gastrointestinal Anomalies	10	7.6%

**Table No. 4: Severity and Gestational Age at Diagnosis of Fetal Anomalies**

Fetal Anomaly	Mild (n=41)	Moderate (n=34)	Severe (n=20)	Gestational Age at Diagnosis (weeks, mean ± SD)
Neural Tube Defects	8	6	6	20.3 (±1.8)
Cardiac Anomalies	12	14	6	22.6 (±2.4)
Skeletal Malformations	5	7	3	24.1 (±1.7)
Genitourinary Anomalies	10	5	3	21.5 (±2.2)
Gastrointestinal Anomalies	6	2	2	23.8 (±2.0)

**Table No. 5: Pregnancy Outcomes**

Pregnancy Outcome	Number of Patients(n=132)	(%)
Preterm Birth	28	21.2%
Low Birth Weight (<2500g)	15	11.4%
Neonatal Hypoglycemia	20	15.2%
Cesarean Section	50	37.9%
Maternal Mortality	2	1.5%

## DISCUSSION

The results of this study align with earlier published research on the frequency of fetal abnormalities in expectant mothers with diabetes. In a research published in 2013, it was shown that the occurrence rate of significant birth defects was 7.0% in newborns to mothers with pre-existing diabetes and 5.6% in newborns to mothers with gestational diabetes<sup>[10]</sup>. The prevalence of 15.2% identified in our research is

somewhat higher than this figure, perhaps because of variations in sample size and study population.

In a research conducted by Evers et al<sup>[11]</sup> in 2002, it was shown that infants to mothers with pre-existing diabetes had a prevalence rate of 9.3% for significant congenital abnormalities, whereas newborns to mothers with gestational diabetes had a prevalence rate of 5.4%. This is also lower than the prevalence seen in our research, maybe due to variations in study design and technique.

The incidence of cardiac abnormalities in our study (24.2%) aligns with previous studies, which has shown a prevalence ranging from 20% to 30% (Rea LD, Correa et al, 2013)<sup>[12]</sup>. The inclusion of both pre-existing and gestational diabetes in our investigation, as opposed to earlier studies that only focused on pre-existing diabetes, may account for this discrepancy.

The fetal malformations seen in our study were in line with earlier studies, with most cases being classified as mild or moderate in severity. This underscores the need of timely identification and appropriate management of diabetes during pregnancy in order to diminish the risk of serious abnormalities<sup>[14]</sup>.

The prevalence of preterm birth (21.2%) and low birth weight (11.4%) seen in this study aligns with earlier research findings, which have shown rates of 20-40% for preterm birth and 10-20% for low birth weight among babies born to women with diabetes<sup>[8]</sup>. This underscores the need of vigilant monitoring and effective management of blood sugar levels during pregnancy in women with diabetes.

The prevalence of caesarean section in our research (37.9%) exceeds the documented incidence of 20-30% in the overall population (American College of Obstetricians and Gynecologists, 2018)<sup>[15]</sup>. The reason for this might be the heightened susceptibility to problems in pregnancies affected by diabetes, such as fetal microsomal and shoulder dystocia.

The two instances of maternal death in our research underscore the need of effective administration and vigilant supervision of diabetes throughout pregnancy in order to avert unfavorable consequences for the mother.

Our work expands the knowledge on diabetes-related pregnancies and outcomes. The results emphasize the need of preconception care, glycemic management, and thorough pregnancy monitoring to lower mother and infant risks. Finding effective therapies to enhance pregnancy outcomes in this high-risk group requires further investigation.

**Study Limitations:** This research has limitations that should be addressed when evaluating findings. First, the study's small sample size may restrict generalizability. Retrospective research design may have led to insufficient or erroneous data gathering. The research used medical data for maternal and fetal outcomes, which may have been inconsistently recorded.

## CONCLUSION

This research indicated that pregnant women with diabetes had several fetal malformations, mostly cardiac anomalies. A large majority of abnormalities were mild or moderate. In this community, premature delivery, low birth weight, and caesarean sections were common, according to the research. These results emphasize the significance of glycemic management and thorough monitoring throughout pregnancy for diabetic women to limit the risk of unfavorable outcomes for both mother and baby. Finding effective therapies to enhance pregnancy outcomes in this high-risk group requires further investigation.

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### Author's Contribution:

Concept & Design of Study: Javeria  
 Drafting: Mubashra Ali  
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 Revisiting Critically: Javeria,  
 Mubashra Ali  
 Final Approval of version: Javeria

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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