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MATERNO-FETAL OUTCOMES OF WOMEN WITH DIABETES IN PREGNANCY ATTENDED AT A PUBLIC REFERENCE SERVICE IN THE CITY OF GOIÂNIA

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ABSTRACT

Introduction: Gestational diabetes and pre-pregnancy diabetes are conditions that can lead to significant complications for both the mother and the newborn. This study analyzed the maternal-fetal outcomes of 163 pregnant women diagnosed with diabetes treated at a public referral service in the city of Goiânia, with data collected between January 2023 and August 2024. **Objective:** To evaluate the main adverse maternal fetal outcomes related to gestational diabetes and diabetes mellitus prior to pregnancy. **Methods:** An observational, cross-sectional, analytical, and retrospective study was carried out with the objective of identifying the main maternal and neonatal complications and evaluating the efficacy of the diagnosis and treatment offered. **Results:** The results indicated that 58.3% of the pregnant women were diagnosed with gestational diabetes due to fasting glucose, and 50% had gestational hypertension as an associated comorbidity. Regarding obstetric outcomes, 50.3% of deliveries were cesarean sections, with failure to induce the main justification. Regarding newborns, 70% did not present neonatal complications, with 86.4% classified as having adequate weight for gestational age and 99.4% achieving good general conditions at the fifth minute of life (APGAR score between 7-10). **Conclusion:** The findings reinforce the importance of adequate prenatal care and effective glycemic control to minimize complications and improve maternal-fetal outcomes, especially in populations served by the public health system

Keywords: Gestational diabetes, maternal-fetal outcomes, prenatal care, public health, neonatology.

INTRODUCTION

Diabetes is the most common endocrinopathy during pregnancy, with a prevalence ranging from 3% to 25%, depending on the ethnic group, population, and diagnostic criteria used[1]. In Brazil, it is estimated that the prevalence of diabetes during pregnancy is around 18%[1]. Hyperglycemia during pregnancy is classified into four groups: type 1 and type 2 diabetes mellitus, pre-existing diabetes mellitus diagnosed during pregnancy (overt diabetes), and gestational diabetes mellitus.[2]

The development of diabetes includes factors such as insulin resistance, hormonal and metabolic changes during the adaptation of the body to fetal needs, as well as genetic and nutritional factors.[3]

Type 1 diabetes is associated with autoimmunity and the destruction of pancreatic β cells, which are

responsible for insulin production.[2] The disease typically manifests in children and adolescents, but it can be diagnosed in adulthood and is classified as latent autoimmune diabetes in adults (LADA)[4], with treatment consisting of exogenous insulin administration. In contrast, type 2 diabetes accounts for 90 to 95% of cases and is characterized by peripheral insulin resistance and partial deficiency in hormone production.[4]

Gestational diabetes mellitus (GDM) refers to transient hyperglycemia during pregnancy and is characterized by the functional incapacity of maternal pancreatic β cells to meet the insulin needs required for fetal development.[5] Additionally, pregnancy is marked by increased production of placental lactogen, cortisol, prolactin, and other counter-regulatory hormones that reduce the effectiveness of insulin in the body.[6]

In Brazil, it is recommended that all pregnant women undergo fasting blood glucose testing during their first prenatal visit, preferably in the first trimester. A value of ≥ 126 mg/dL or HbA1c ≥ 6.5% is characterized as pre-existing diabetes with a diagnosis during pregnancy (overt DM). In the case of fasting glucose values between 92 mg/dL and 125 mg/dL, the patient is diagnosed with gestational diabetes.[1,4]

In the case of pregnant women without a prior diagnosis of diabetes, i.e., with initial tests within normal limits, they should undergo an oral glucose tolerance test (OGTT) between the 24th and 28th week of gestation. The reference values for this test are: fasting glucose ≥ 92 mg/dL, glucose 1 hour after ingesting 75g of glucose ≥ 180 mg/dL, and glucose 2 hours after ingestion ≥ 153 mg/dL, with only one altered value being necessary for diagnosis.[1]

Regarding treatment, the initial measures include lifestyle changes, dietary adjustments, and physical activity. In women with pre-gestational type 1 or type 2 diabetes or gestational diabetes (GDM) who do not achieve good glycemic control with the aforementioned measures, pharmacological treatment should be initiated after 1-2 weeks of initial management. Approximately 15% to 60% of diabetic pregnant women require insulin in addition to initial measures for disease control.[5]

According to the American Diabetes Association (ADA, 2019), the expected glycemic values during treatment are: fasting glucose (GJ) < 95 mg/dL, postprandial glucose 1 hour after eating < 140 mg/dL, and postprandial glucose 2 hours after eating < 120 mg/dL. 7 Glucose measurements should be maintained throughout the pregnancy until delivery. Inadequate control is considered when 30 to 50% of the glycemic measures are abnormal.[8]

The treatment of poorly controlled diabetes with initial measures can be done with subcutaneous insulin or oral antidiabetic drugs. The insulin regimen is the most studied and can be administered with rapid-acting, ultra-rapid, intermediate, and long-acting subcutaneous insulin or by continuous insulin infusion. Pregnant women who were already using insulin before pregnancy should receive a lower dose of medication during the first trimester, with the dose potentially increasing between the 18th and 24th week. In the third trimester, due to the action of counter-regulatory hormones on insulin, an increase in dosage may be necessary based on the evaluation of fetal growth during the third trimester.[7,9]

Oral antidiabetic drugs (OADs) may be considered in some special situations, such as when adherence to or access to insulin is not feasible, and in cases of severe hyperglycemia that is not controlled with high doses of insulin, in addition to offering greater dosing convenience.[8,10] Some of the drugs studied include metformin and glibenclamide for treating gestational diabetes. A meta-analysis compared the use of metformin and insulin in pregnant women with gestational diabetes, showing that oral antidiabetic therapy was successful as monotherapy in 66% of cases.[10]

The presence of diabetes during pregnancy is associated with worse maternal and fetal outcomes. Among some of these fetal complications, the following stand out: spontaneous abortion, maternal and perinatal mortality, birth trauma, macrosomia, jaundice, infections, congenital malformations, perinatal asphyxia, hypoglycemia, and neonatal respiratory distress syndrome. Maternal complications include hypertension, preeclampsia, polyhydramnios, preterm labor, premature rupture of membranes, and an increased cesarean section rate.[5,7,9]

Diabetes is not an absolute indication for cesarean delivery. In patients with good glycemic control, the route of delivery is obstetric. According to the protocols of the American Diabetes Association (ADA, 2019), the recommendations are as follows: in women with well-controlled GDM through diet and physical activity, delivery should occur between 39 weeks and 40 weeks and 6 days; in women with well-controlled GDM on medication, delivery should occur between 39 weeks and 39 weeks and 6 days; women with pre-existing diabetes before pregnancy should be monitored starting at 37 weeks and, if glycemic control remains good, can reach 39 weeks. Delivery may be accomplished through labor induction or cesarean section, depending on medical indications.[11]

It is known that the main risk factor for the development of type 2 diabetes and metabolic syndrome in women is a history of GDM. In this context, it is clear that hyperglycemia during the pregnancy-puerperal cycle constitutes a significant public health issue, not only due to worse perinatal outcomes but also because of the increased risk of future diseases, following the obesity epidemic observed in several countries.[11]

The objective of this study is to identify maternal and fetal outcomes in women with diabetes treated at a public healthcare service in Goiânia.

METHODOLOGY

This is an observational, cross-sectional, analytical, and retrospective study. The research was conducted at the Hospital e Maternidade Dona Íris (HMDI), located at Av. Emílio Póvoa, number 165, Goiânia – Goiás.

The study was conducted using the database provided, which contains 163 (one hundred and sixty-three) observations with information about the pregnant women, deliveries, and newborns. Data were collected between January 2023 and August 2024 from medical records available in the Tasy system. The sample included pregnant women diagnosed with gestational diabetes or pre-existing diabetes who had their deliveries performed at HMDI.

Pregnant women who were transferred to other units and did not deliver at the Hospital e Maternidade Dona Íris, as well as medical records with incomplete data, were excluded from the sample.

For the preparation of the report, the database of the pregnant women was used, excluding the names of the participants. The observed variables were:

- Age;
- Obstetric History (GRAVIDA/PARA);
- Gestational Age;
- Diabetes Diagnosis;
- Treatment;
- Delivery;
- Cesarean Section Reason;
- Other Comorbidities;

- APGAR Score;
- Fetal Weight;
- Neonatal Intercurrences;

Five variables needed transformation. The gestational age was initially in text format and was converted into numerical values. The GRAVIDA/PARA variable was in code format (e.g., "G3P1N1CA1"). This was split into six columns to represent the information in the code, such as the number of pregnancies, number of deliveries, number of cesarean sections, and number of live births. Gestational age was also initially in text format and was converted to numerical values. The delivery variable was separated into cesarean and normal deliveries, and for better analysis, it was consolidated into a single variable. The APGAR scores were recorded in columns corresponding to the first minute and the fifth minute of life.

The database contains 16 variables. The quantitative variables are: Age of the pregnant women; number of pregnancies; number of births; number of cesarean sections; number of live births; number of abortions; gestational age; APGAR at 1 minute; and APGAR at 5 minutes. The qualitative variables are: Diabetes diagnosis; treatment; type of delivery; reason for cesarean section; other comorbidities; fetal weight; and neonatal complications.

Descriptive statistics were used to assess the outcomes of the conditions of the pregnant women, the deliveries, and the neonates. Additionally, a chi-square test was applied to check the association between qualitative variables, and a correspondence plot was used to observe which categories of the fetal weight variable and diabetes diagnosis are related.

The chi-square test is calculated using the formula:

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{c}\frac{\left(O_{ij} - E_{ij}\right)^2}{E_{ij}}$$

Where,
r is the number of rows (categories of variable A),
c is the number of columns (categories of variable B),
Oij is the observed frequency in the (i,j) cell,
Eij is the expected frequency in the (i,j) cell.

The correspondence analysis, in turn, is a multivariate statistical technique used to explore and visualize relationships between categories of qualitative variables.

All analyses were performed using Microsoft Excel and the R software with the following packages: readxl, dplyr, ggplot2, ade4, sjPlot, and reshape2. The next section presents the results of the exploratory data analysis.

RESULTS

The results were divided into the profile of the pregnant women, obstetric profile, and neonatal profile. Additionally, an association test between qualitative variables was conducted.

Profile of the Pregnant Women

The participants in the study range in age from 15 to 45 years, with 75% of the women being younger than 33 years old. The average age is 28.02, as shown in Table 1.

Table 1: Summary statistics of the pregnant women's age

Measure	Years
Minimum Value	15
First Quartile	22
Median	27
Median	28.02
Third Quartile	33
Maximum Value	45

Source: Compiled by the authors

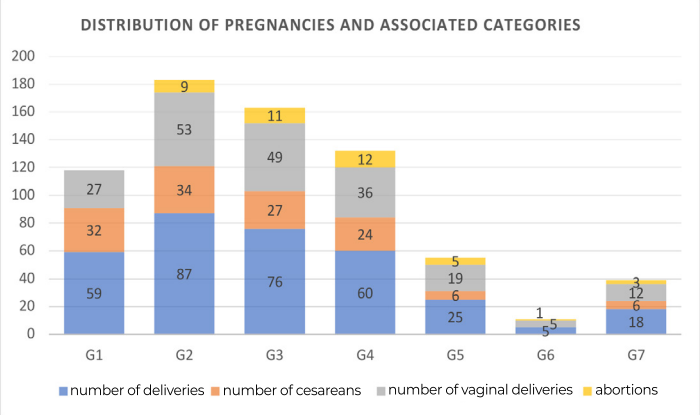
To understand the diabetes diagnosis of the patients, their reproductive history was examined. The analysis will be based on the number of pregnancies each of the 163 women had throughout their life. Table 2 shows the occurrence of pregnancies.

Table 2: Frequency distribution of pregnancies per woman

Number of Pregnancies	Number of Women
1	59
2	47
3	29
4	18
5	6
6	1
7	3

Source: Compiled by the authors

It is possible to observe that 36.8% of women had one pregnancy, and as the number of pregnancies increases, the number of women decreases. In Figure 1, based on the number of pregnancies, we can observe the other categories of the obstetric history.



Source: Compiled by the authors

Figure 1: Distribution of pregnancies and associated categories

It is noticeable that the number of cesarean sections decreases in women who have had two or more pregnancies. The rate drops from 54.23% for women with one pregnancy to 39.08% for those with two, 35.52% for those with three, 40% for those with four, 24% for those with five, 0% for those with six, and 33.3% for those with seven.

With this history, the majority of the pregnant women in the study were diagnosed with Gestational Diabetes Mellitus (GDM) by Fasting Blood Glucose (FBG), 58.3%. Following that, GDM was diagnosed through the Oral Glucose Tolerance Test (OGTT). The condition that can be considered chronic, such as Overt or Type 1 and Type 2 Diabetes Mellitus, occurred in 4 (2.5%) patients.

Table 3: Diabetes diagnosis in the sample

Diabetes	Outcomes
Gestational Diabetes Mellitus (GDM)	95 (58.3%)
Gestational Diabetes identified by Oral Glucose Tolerance Test (OGTT)	50 (30.7%)
Overt Diabetes Mellitus (Overt DM)	9 (5.5%)
Type 2 Diabetes Mellitus	5 (3.1%)
Type 1 Diabetes Mellitus	4 (2.5%)

Source: Compiled by the authors

In addition to diabetes, other comorbidities were reported, but not by all patients. The most frequent condition among these diseases was hypertension, with a higher number of cases being gestational hypertension, but chronic hypertension was also observed. Table 4 presents the occurrences of the other described comorbidities.

Table 4: Other comorbidities reported by the pregnant women

Comorbidities	Outcomes
Gestational Hypertension (GH)	18 (50%)
Hypothyroidism	7 (19.4%)
Chronic Hypertension (CH)	4 (11.1%)
Preeclampsia	3 (8.4%)
CH + Hypothyroidism	1 (2.8%)
Intrauterine Growth Restriction (IUGR)	1 (2.8%)
GH + Preeclampsia	1 (2.8%)

Source: Compiled by the authors

For the treatment of diabetes, three different forms of treatments were identified, as well as patients without follow-up (control).

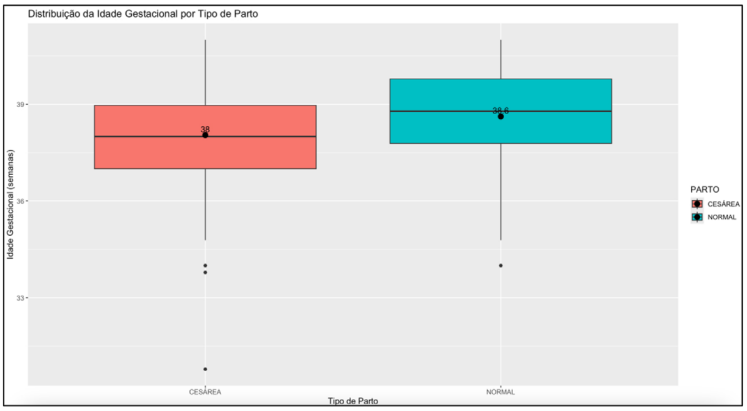
Table 5: Types of treatment

Treatment	Outcomes
Not Diagnosed Gestational Diabetes Mellitus	56 (34.4%)
Diet, No Control	38(23.3%)
Diet, Well Controlled	36 (22.1%)
Metformin, No Control	10 (6.1%)
Insulin, Well Controlled	10 (6.1%)
Insulin, Poorly Controlled	6 (3.7%)
Insulin, No Control HbA1c	6 (3.7%)
Type 2 Diabetes Mellitus (DM2), No Treatment	1 (0.6%)

Source: Compiled by the authors

Obstetric Profile

Among the deliveries in the study, 82 (50.3%) were cesarean sections and 81 (49.7%) were vaginal births. Regarding gestational age, on average, women who had a cesarean section were at 38 weeks of pregnancy, while those who opted for a vaginal birth were at 38.6 weeks.



Source: Compiled by the authors

Figure 2: Distribution of gestational age by type of delivery

The main justification for performing a cesarean section, at 11.1%, was due to induction failure. This is the most frequent reason for cesarean procedures. What the data show is that the variety of reasons for cesarean sections was the rule in this sample of pregnant women with diabetes.

Table 6: Obstetric outcome profile: Reasons for cesarean sections

Reasons for Cesarean Sections	Outcomes
Induction Failure	15 (1.,9%)
Maternal Desire	11 (8.7%)
Fetal Distress	8 (6.3%)
Cessation of Progression	7 (5.6%)
Fetal Tachycardia	6 (4.8%)
Iterativity and GDM	6 (4.8%)
Previous Cesarean Section and GDM	4 (3.2%)
Breech Presentation	2 (1.6%)
Severe Preeclampsia	2 (1.6%)
Fetal Bradycardia	1 (0.8%)
Previous Cesarean Section + IUGR + GDM	1 (0.8%)
Previous Cesarean Section + Roprema	1 (0.8%)
Previous Cesarean Section + GDM + GH	1 (0.8%)
Early IUGR	1 (0.8%)
GDM Uncontrolled + Iterativity + Severe PE	1 (0.8%)

Placental Abruption	1 (0.8%)
Centralized Fetus	1 (0.8%)
Twin Pregnancy	1 (0.8%)
Iterativity + Type 1 DM	1 (0.8%)
Iterativity + Overt DM + GH	1 (0.8%)
Prosencephaly	1 (0.8%)
Previous Cesarean Section + DM and Severe PE	1 (0.8%)
Intrapartum Deceleration	1 (0.8%)
Undiagnosed GDM + Cesarean Section <18 Months	1 (0.8%)
Twin Pregnancy + Overt DM	1 (0.8%)
FM + GDM + Uncontrolled GH	1 (0.8%)
Iterativity + Uncontrolled Overt DM	1 (0.8%)
Fetal Death + 28 Weeks + Iterativity	1 (0.8%)

Source: Compiled by the authors

In the normal deliveries, 42 patients required induction to begin or accelerate the process, as shown in Table 7.

Table 7: Obstetric outcome profile: Reasons for normal deliveries

Reasons for Normal Delivery	Outcomes
Normal delivery after induction	42 (33.3%)

Source: Compiled by the authors

Almost 70% of the births from patients with diabetes during pregnancy had no complications. When complications were diagnosed, pulmonary issues and bilirubin accumulation in the blood were the most frequent.

Tabela 8: Desfechos ao Nascimento: Intercorrências

Complications	Outcomes
None	123 (75.4%)
Respiratory Distress Syndrome	12 (6.76%)
Jaundice	11 (6.16%)
Transient Tachypnea of the Newborn	4 (1.86%)
Respiratory Distress Syndrome and Jaundice	3 (1.26%)
Shoulder Dystocia	3 (1.26%)
Neonatal Intensive Care Unit (NICU)	1 (0.06%)
Caudal Regression Syndrome	1 (0.06%)
Respiratory Distress Syndrome, Jaundice, and Malformations	1 (0.06%)
Intrauterine Fetal Death	1 (0.06%)
Microcephaly	1 (0.06%)
Cardiac Malformation, Brain Malformation, Neonatal Respiratory Distress Syndrome	1 (0.06%)
Neonatal Asphyxia and Neonatal Respiratory Distress Syndrome	1 (0.06%)

Source: Compiled by the authors

The newborns were born with an appropriate weight for gestational age in 86.4% of cases. Out of the 163, only 6 (3.7%) were below the 10th percentile and 16 (9.9%) were above the 90th percentile.

Table 9: Birth outcomes: Fetal weight

Fetal Weight	Outcomes
Appropriate for Gestational Age (AGA)	140 (86.4%)
Large for Gestational Age (LGA)	16 (9.9%)
Small for Gestational Age (SGA)	6 (3.7%)

Source: Compiled by the authors

In the APGAR evaluation, which aims to determine the health condition of the newborn and the need for medical assistance, the outcomes are described in Table 10. One important note should be made regarding the APGAR scores at the first and fifth minutes of life. In one case, a value of 0 was recorded for both the first and fifth minute APGAR due to intrauterine fetal death, which was noted in the complications. An APGAR score between 7 and 10 is considered a healthy newborn with good vitality, an APGAR score between 4 and 6 indicates a moderately depressed condition due to moderate asphyxia, and an APGAR score between 0 and 3 indicates a critical condition with severe asphyxia.

Table 10: Birth outcomes: APGAR

APGAR 1 Minute	Outcomes
Healthy condition	148 (90.8%)
Moderately depressed condition	12 (7.4%)
Critical condition	3 (1.8%)
APGAR 5 Minutes	**Outcomes**
Healthy condition	162 (99.4%)
Critical condition	1 (0.6%)

Source: Compiled by the authors

Figures 3 and 4 compare gestational age with APGAR at the first and fifth minutes by fetal weight. In this analysis, one observation was excluded because there was no record of weight. As mentioned in the previous paragraph, the reason for the absence of the data was due to intrauterine fetal death.

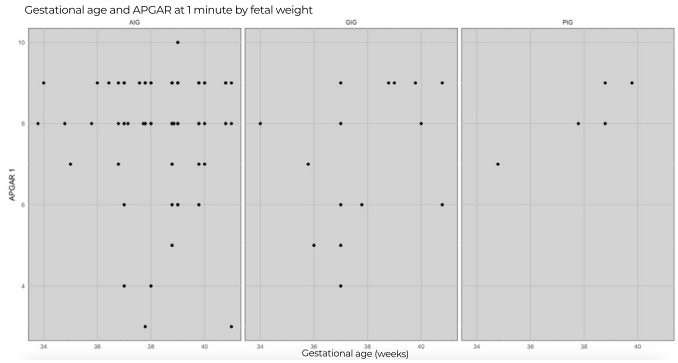


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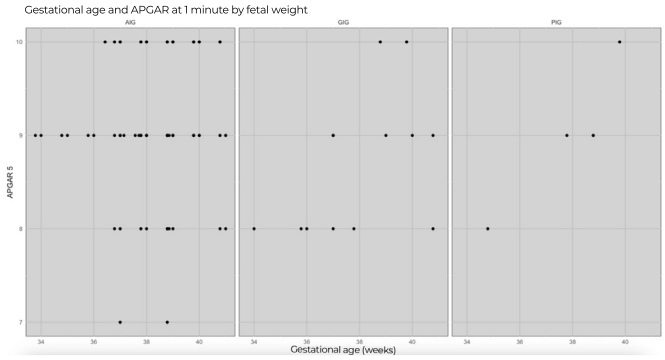
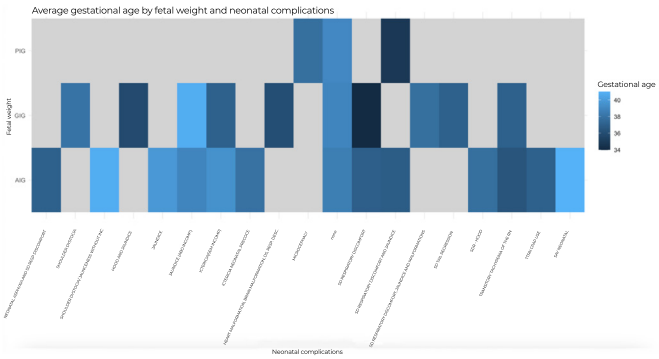
Figure 3: Gestational age and APGAR at 1 minute by fetal weight



Source: Compiled by the authors

Figure 4: Gestational age and APGAR at 5 minutes by fetal weight

Figure 4 (APGAR at 5 Minutes) demonstrates that even newborns with weight above the 90th percentile and below the 10th percentile had an APGAR score of 10.



Source: Compiled by the authors

Figure 5: Heatmap of neonatal complications by average gestational age and fetal weight

Figure 5 shows neonatal complications based on fetal weight and average gestational age, excluding fetal intrauterine death. The blue-shaded blocks indicate where the complication is observed at the corresponding birth weight. The color gradient ranges from darker to lighter tones, with lighter shades representing pregnancies near 40 weeks and darker shades corresponding to an average gestational age of about 34 weeks.

Chi-Square Test for Association Between Qualitative Variables

To assess the association between two qualitative variables, the chi-square test was used for the variables: Diabetes Diagnosis, Type of Delivery, Treatment, and Neonatal Complications. The results are presented in Table 1.

The hypotheses are formulated as follows:

Null hypothesis (H_0): The variables are independent (not associated).

Alternative hypothesis (H_1): The variables are dependent (there is an association).

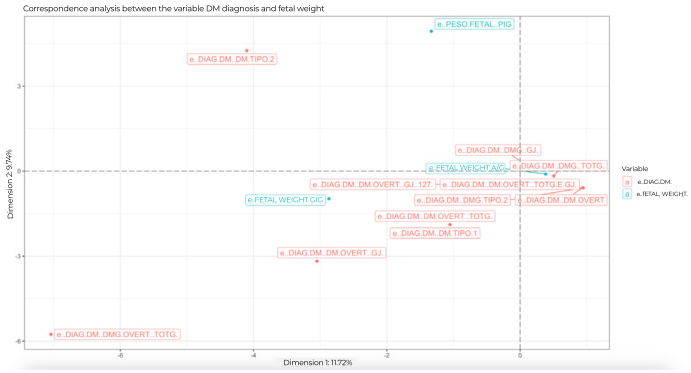
We reject H_0 at a 5% significance level.

Quadro 1: Results of the Chi-square association tests

Tested Hypotheses	p-value	Decision
Neonatal Complications vs Treatment	0.036	The variables are associated
Treatment vs Fetal Weight	0.060	The variables are not associated
Diabetes Diagnosis vs Fetal Weight	0.04844	The variables are associated
Diabetes Diagnosis vs Neonatal Complications	0.003286	The variables are associated

Source: Compiled by the authors

We can verify which categories of the variables are most associated through correspondence analysis. Since the variables in the study have many categories, we will present this only for the chi-square test of association between Diabetes Diagnosis and Fetal Weight, which was statistically significant.



Source: Compiled by the authors

Figure 6: Correspondence Analysis between the variable Diabetes Diagnosis and Fetal Weight

Figure 6 shows that AGA fetal weight AGA has a strong association with the diabetes diagnosis GDM (FBG), GDM OGTT, OVERT DM (OGTT and FBG) and DM Type 2. SGA Fetal weight shows an association, but with a weaker strength, with DM Type 2, while LGA fetal weight GIG also has a weaker association in intensity with DM OVERT and DM Type 1.

DISCUSSION

According to the Brazilian Society of Diabetes (SBD, 2022), one of the risk factors associated with the development of diabetes is advanced age, over 35 years.[1] In the research conducted at the maternity hospital, the majority of pregnant women were in the average age range of 28.02 years, with 75% of the women being younger than 33 years. This could be related to the lack of preconception planning and the increasing rates of metabolic syndrome in younger patients.

The pathophysiology of gestational diabetes is related to the physiological changes during pregnancy that increase glucose consumption and counterregulatory hormones. Additionally, both gestational diabetes and pre-existing diabetes are associated with a high risk of adverse maternal and fetal outcomes. Therefore, it is essential to correctly diagnose this condition during prenatal care, in the first trimester with fasting blood glucose and in the second trimester with the oral glucose tolerance test (OGTT). In this study, it was found that the majority of patients diagnosed with gestational diabetes (58.3%) were diagnosed through fasting blood glucose alterations, while 28.2% were diagnosed through the OGTT. Around 9 women (5.5%) were diagnosed with type 2 diabetes during pregnancy (overt DM), while 3.1% had already been diagnosed with type 2 diabetes and 2.5% had type 1 diabetes.

Approximately 56 women (34.4%) were diagnosed with diabetes at the time of hospital admission, and therefore, did not receive proper prenatal care. Among the diagnosed patients, 74 patients were identified who underwent the first-line treatment for gestational diabetes, which involves changes in diet and lifestyle. However, only 22.1% achieved good glycemic control. Among the pregnant women who required pharmacological treatment, around 13 women used insulin, of whom 6.1% achieved good glycemic control,

3.7% were poorly controlled, and 3.7% did not perform capillary blood glucose measurements. As for patients using metformin (6.1%), none performed any glycemic control. Additionally, one patient diagnosed with type 2 diabetes did not undergo any treatment.

In the short term, diabetes leads to the development of additional complications during pregnancy and becomes a risk factor for other comorbidities, with hypertension being the most common.[1,10] Among the 163 patients analyzed, 35 women presented other comorbidities during pregnancy, with 50% diagnosed with gestational hypertension (GH), followed by hypothyroidism (19.4%), chronic hypertension (11.1%), pre-eclampsia in 11.2% of cases, and 2.8% with intrauterine growth restriction (IUGR), which was strongly associated with women with pre-existing diabetes, a condition due to the vasculopathy observed in these patients.

The timing of pregnancy termination will depend on the pregnant woman's glycemic control and the type of treatment used. For patients who made changes to their diet and lifestyle and achieved good glycemic control, delivery can be performed between 39 weeks and 40 weeks and 6 days. In women with well-controlled diabetes using medication, delivery can occur between 39 weeks and 39 weeks and 6 days. For patients with pre-existing diabetes, the goal is to reach full term (37 weeks) and not exceed 39 weeks11. In contrast, patients who did not perform the glucose curve during prenatal care or did not achieve good control even with treatment may have the pregnancy terminated starting at 37 weeks. In the present study, the average gestational age for termination was between 38 weeks and 38 weeks and 6 days.

Regarding the mode of delivery, although diabetes is not an absolute indication for cesarean section, 82 (50.3%) women required the procedure. The main reasons for cesarean section were failure of induction of normal labor, followed by maternal request (7.9%); fetal distress (not detailed in the medical record) (6.3%); failure to progress in labor (5.6%); fetal tachycardia (4.8%); patients with a previous cesarean section, with or without other comorbidities, who did not desire vaginal delivery (4.8% of the sample); and women with 2 or more cesarean sections (repeat cesarean section), accounting for 8% of the sample.

Regarding the neonatal outcome, the results show that about 70% of newborns from mothers with diabetes did not present neonatal complications, which is a positive finding, as it indicates that most births occurred without immediate complications. However, the most frequent complications observed among neonates were respiratory distress syndrome (RDS) in 6.76% of the sample, which is attributed to prematurity and hyperinsulinemia that delays surfactant production. Jaundice was observed in 6.16% of cases, due to the increased production of red blood cells resulting from the hyperglycemic environment. These findings are consistent with the literature that describes these conditions as common in newborns of diabetic mothers.[1,12]

Regarding diabetes and fetal weight, in the present study, it was possible to verify that the majority of newborns (86.4%) were appropriate for gestational age (AGA), which is an important finding for neonatal prognosis, as AGA weight is often associated with better neonatal outcomes.

The analysis of the APGAR score revealed that the vast majority of newborns received APGAR scores between 7-10 in the first minute (90.8%) and the fifth minute (99.4%), suggesting good adaptation to the extrauterine environment. The APGAR score in the first minute showed that, despite many newborns presenting good conditions at birth, some were still classified as moderately depressed (APGAR 4-6) or critically depressed (APGAR 3-0), which may reflect episodes of asphyxia or initial respiratory difficulties, especially among neonates with low birth weight or pulmonary complications.

An important observation regarding the APGAR score in the first minute is the difference compared to the APGAR score in the fifth minute, which shows an overall improvement in the condition of the newborns after the first minutes of life. This finding can be explained by the time needed for newborns to adjust to air

breathing after birth, especially in cases of transient respiratory disturbances, such as transient tachypnea of the newborn, which was observed in 1.86% of the cases.

CONCLUSION

This study highlights the complexity of gestational diabetes (GDM) and its implications for both pregnant women and newborns. The analysis reveals that most pregnant women diagnosed with gestational diabetes did so late, emphasizing the importance of proper prenatal care to prevent complications. Although lifestyle modifications and diet represent the first line of treatment, a significant portion of the pregnant women required medications such as insulin or metformin, with adequate glycemic control being achieved by a minority.

Regarding maternal complications, a high incidence of associated comorbidities was observed, such as gestational hypertension and hypothyroidism, in addition to an increased risk of cesarean section. For the newborns, although most presented with good APGAR scores, respiratory complications like respiratory distress syndrome and jaundice were common, especially among babies of mothers with diabetes. The risk of excessive fetal growth and the impact of hyperinsulinemia were also highlighted, with a significant portion of the newborns being classified as large for gestational age.

Therefore, the results reinforce the need for early diagnosis and rigorous monitoring during pregnancy, with appropriate treatment strategies to ensure the health of both the woman and the newborn. Proper management of gestational blood sugar, coupled with careful handling of comorbidities, is crucial to minimize risks and improve maternal and neonatal outcomes.

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