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Effects of Abnormal Glucose Metabolism during Pregnancy on Pregnancy Complications and Maternal and Fetal Outcomes

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Abstract: Abnormal glucose metabolism during pregnancy is one of the important factors that affect the delivery rate and health level of pregnant women, and it is also a disease that needs to be properly treated and treated when pregnant women face serious complications or death risks. In order to reduce or avoid the impact of diabetes in pregnancy on pregnant women and fetuses, it is necessary to study the relationship between diabetes and pregnancy complications and fetuses. Deeply understand this knowledge and reduce unnecessary injuries. This paper mainly uses the survey method, data comparison and repeated analysis of variance to obtain relevant data. The survey results show that more than 50% of people generally know little about the serious consequences of abnormal glucose metabolism during pregnancy. Therefore, it is necessary to popularize relevant knowledge to avoid complications as much as possible.

1. Introduction

Abnormal glucose metabolism during pregnancy has different effects on the quality of life and health of pregnant women with diabetes and their fetuses. The abnormal glucose metabolism during pregnancy has an important impact on the complications of pregnant abdominal cavity, and the blood glucose level is one of the effective means to judge whether pregnant women are diabetes. Due to the lack of awareness of hyperglycemia and hyperlipidemic events and the lack of corresponding treatment ability of pregnant women, the probability of complications is increased.

There are many theories about the abnormal glucose metabolism during pregnancy and the effect of the disease on complications and fetus. For example, some researchers pointed out that pregnant women with abnormal glucose metabolism during pregnancy will still have some complications if treated properly. Therefore, strict prenatal treatment, timely diagnosis and appropriate treatment for pregnant women with abnormal glucose metabolism can effectively improve the results of mothers and infants [1-2]. Some researchers also claimed that abnormal glucose metabolism during pregnancy can lead to complications of different degrees for mothers and children. Therefore, pregnant women with abnormal glucose metabolism during pregnancy should be treated in time to

protect the health of mothers and infants [3-4]. Other researchers believe that abnormal glucose metabolism during pregnancy can lead to a significant increase in the incidence rate of newborn rats, and the newborn weight and PI are higher than those of mothers without abnormal glucose metabolism [5-6]. Therefore, it is of great significance to monitor the blood glucose of pregnant women during pregnancy. By studying the correlation between pregnant women with diabetes and pregnancy complications and the impact of maternal and infant outcomes, it is of practical significance to popularize the knowledge about the dangers of diabetes in pregnancy.

In this paper, we first studied the metabolic abnormalities during pregnancy, that is, pregnant women with diabetes, and analyzed its impact and background. Secondly, it discusses the pregnancy complications of diabetes and the influence of mother and baby, and puts forward the factors of suffering from diabetes. Then the data of abnormal glucose metabolism during pregnancy were investigated and analyzed. Finally, relevant conclusions are drawn through data comparison.

2. Complications of Abnormal Metabolism during Pregnancy and Maternal and Fetal Outcomes

2.1 Metabolic Abnormalities during Pregnancy

Gestational diabetes (GDM) affects 10% of pregnant women and has a negative impact on producers and offspring. GDM will not only increase the pregnancy hypertension, cesarean section rate, neonatal hypoglycemia and other complications of perinatal mothers and offspring, but also lead to the disorder of blood lipid metabolism and fat accumulation of newborns due to the influence of its glycolytic metabolism disorder. The abnormal transport of placental lipids and adipocytokines increases the incidence rate of megaloblastic children. At the same time, it affects the neural development and psychological cognition of fetus and newborn, and increases the risk of long-term cardiovascular disease and some metabolic diseases in offspring. During pregnancy, the fat metabolism of pregnant women has changed significantly to meet the growth and development needs of the fetus, which is manifested by increased fat synthesis in the first three months and the second month of pregnancy, and increased fat loss in the third month.

Diabetes is a common clinical disease, which accounts for a large proportion of complications in late pregnancy. Due to the low insulin sensitivity, it is easy to cause symptoms such as angina pectoris and pituitary inhibition, which lead to various adverse emotional reactions. If long-term treatment at a high level can significantly reduce the probability of complications. Diabetes hyperglycemia has a great adverse effect on fetal growth, neural function and motor system. At the same time, due to long-term medication, glucocorticoids can cause the accumulation of edema substances in the fetal uterus from a mild state of excitement, resulting in stress pain response. When the concentration of glucocorticoid is too high, it is easy to cause hypoxemia. The main manifestations are as follows: firstly, hyperglycemia has a serious impact on postpartum hemorrhage and wound healing during pregnancy, leading to infection, peritonitis and other complications. Secondly, it increased the level of fetal hormone to a certain extent. Due to the high or low blood sugar level, diabetes patients will have hypoglycemia, hyperlipidemia, coronary heart disease and other complications in the late pregnancy [7-8].

According to the survey of blood glucose level of pregnant women, abnormal glucose metabolism can be divided into three types: mild, moderate and severe. One of the main reasons for abnormal glucose metabolism is insufficient energy supply. During pregnancy, due to excessive blood supply and body hypoxia, a large amount of glucose volume content increased. However, too much carbon dioxide will reduce the activity of sucrase in the body. It also leads to increased insulin sensitivity, decreased secretion of islet cells and oxidation products. Glycoprotein

concentration increases due to factors such as insulin secretion and active hormone metabolism in the body [9-10].

2.2 Pregnancy Complications of Diabetes and Maternal and Infant Effects

Patients with diabetes are the main factors affecting the outcome of pregnancy, and most of them are treated with insulin clinically. Abnormal glucose metabolism during pregnancy is mainly caused by high blood glucose level. Hyperglycemia will lead to central hypotension, which will aggravate the placental and mucosal barrier of the fetus and cause indirect damage to the fetus. Through the study on the blood glucose level, BMI and glucose metabolism rate of pregnant women, it can be found that the abnormally high concentration group and the severe low-grade ineffective period are the risk factors affecting glucose metabolism, in which ischemia and hypoxia can cause glucose poisoning. At present, the abnormal glucose metabolism during pregnancy has a certain impact on the nutritional and immune functions of patients, but it lacks predictability for clinical treatment. The first is to worry that it can effectively reduce the probability of pregnancy complications and improve the quality of life. Secondly, due to some bad habits and differences in psychological status of pregnant women themselves, it is impossible to correctly evaluate the growth and development of the fetus on the placenta. The main causes of abnormal glucose metabolism include disorders of immune function and hormone regulation, which pose a threat to fetal health [11-12].

Abnormal glucose metabolism during pregnancy can lead to fetal intrauterine distress, uterine contraction or acidosis, and lead to changes in calcium deficiency and insomnia behavior, thereby reducing the intrauterine tolerance of the fetus and increasing the incidence of final postpartum complications. The newborn is born with congenital malformation, resulting in osteoporosis caused by stunting. The immunity of pregnant women is reduced, the body function is disordered, the growth is slow, and albinism. Abnormality of reproductive system and increase of hormone level lead to decrease of estrogen secretion in mother and infant, which leads to anemia edema and other complications in pregnant women. Diabetes during pregnancy seriously affects the health of mothers and infants, and can lead to pregnancy hypertension, premature delivery, abortion, infection and other complications, as well as other complications, such as light weight children, respiratory distress syndrome, meconium aspiration, shoulder dystocia and so on. Rapid and effective control of maternal blood glucose has an important impact on improving maternal quality of life and perinatal health.

The causes of abnormal glucose metabolism during pregnancy include dietary habits, fatigue, hormone changes, etc. The influence of abnormal glucose metabolism on the intra-abdominal fetus of pregnancy is related to factors such as age and education level of pregnant women. It is necessary to control the energy intake and the maintenance time of insulin level during the fetal period. Use drugs correctly according to the doctor's instructions [13-15].

3. Data and Methods

3.1 Research Methods

A total of 240 people were interviewed, and the answers of 10 people were distorted. This study finally collected complete relevant data of 230 patients. From April 2021 to April 2012, pregnant women with diabetes in pregnancy were investigated, and prenatal information, disease knowledge of patients with diabetes in pregnancy and case method suggestions were collected. The pregnant women with the same gestational age were also divided into normal glucose tolerance group (NGT) and diabetes group (GDM). The research process is shown in Figure 1:

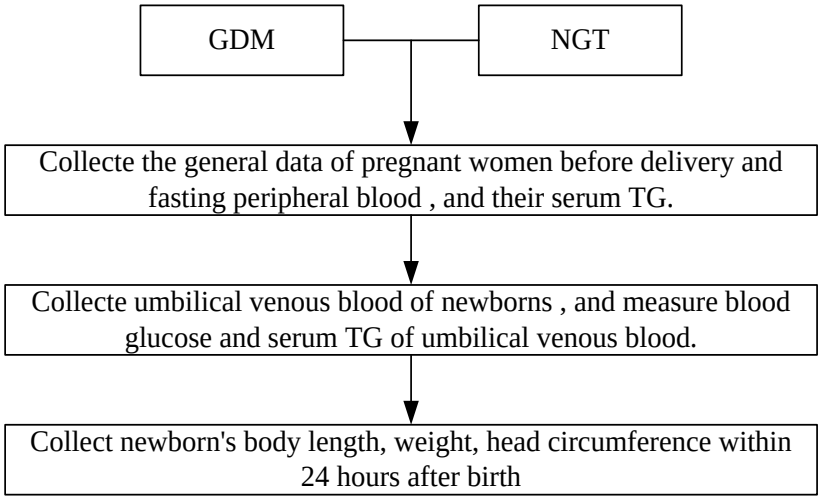

Figure 1: Research Process

3.2 Intervention Methods

Psychological intervention. Pregnant women do not understand the disease and worry about the fetus, which is easy to produce stress and anxiety, affecting the treatment effect and pregnancy outcome. They should inform their families and pregnant women, explain relevant knowledge, give pregnant women confidence and maintain a good attitude.

Food intervention. For pregnant women, sugar intake should be strictly controlled and fiber should be properly supplemented to ensure their health. Normal weight before pregnancy Weight gain during pregnancy is controlled to be less than 11 kg for pregnant women before pregnancy and less than 9 kg for obese women, and blood glucose and urine regulation are monitored.

A lot of exercise can strengthen the body and promote the treatment of diseases. Walk or exercise for 30 minutes every day.

Insulin therapy is appropriate for patients with insufficient blood glucose control. The incidence of pregnancy complications, birth distribution and perinatal complications were compared between the two groups.

The questionnaire includes collecting basic information, including the age, gender, education level, occupation, medical insurance and family income of pregnant women with diabetes. Knowledge of diabetes, breastfeeding and diabetes pregnant women's knowledge of the risk of diabetes and the negative consequences of diabetes delivery during pregnancy. Breastfeeding cognition and pregnancy outcome study. Through telephone follow-up and follow up, the breast-feeding situation of pregnant women with diabetes was recorded 20 days after birth and 40 days after birth. According to the nutritional status of infants within 40 days, the pregnant women with diabetes who were examined were divided into two groups: women who were exclusively breastfed (150 cases) and women who were not exclusively breastfed (80 cases). The recovery of blood glucose level of pregnant women with different feeding methods, infant development and reasons for breastfeeding were recorded. The factors affecting breastfeeding were analyzed.

3.3 Consideration Criteria

The criteria include: diabetes during pregnancy. The patient is aware of this research and willing to cooperate.

Exclusion criteria: people with a history of mental illness, cognitive impairment, serious infection, and serious cardiopulmonary injury.

The measured data is expressed as an average value. The count data is expressed in percentage, and the relevant data is analyzed by ANOVA. The variance formula is as follows:

$$\sigma^2 = \frac{TT}{\mathrm{m}} = \frac{\sum (a-\bar{a})^2}{\mathrm{m}} \tag{1}$$

Where, σ^2 is the variance, a is the relevant data, and m is the number of data.

Logistic regression analysis was used for multiple correlation analysis. Make a scatter diagram in MATLAB, and then perform exponential function fitting:

$$\mathrm{g(a)} = x * \exp(y \cdot a) + d * \exp(c * a) \tag{2}$$

Assuming Logis (Y, a)=G (a), the regression curve analysis is expressed as:

$$T(a) = n * Logis(Y, a+s)/(m + Logis(Y, a+s)) \tag{3}$$

Blood glucose, infant size and weight were measured at different times by repeated analysis of variance. The difference was significant (P<0.05).

4. Analysis of Survey Results

4.1 Blood Glucose Changes in GDM Patients

Table 1: Blood Glucose Changes in GDM Patients

	Blood glucose	Exclusive breastfeeding	Non-exclusive breastfeeding	Variation range
Ante partum	7.64	7.6	7.8	1.54
Twenty days after delivery	6.83	6.8	6.6	2.65
Forty days after delivery	6.22	6.23	6.11	3.71
P	0.005	0.21		

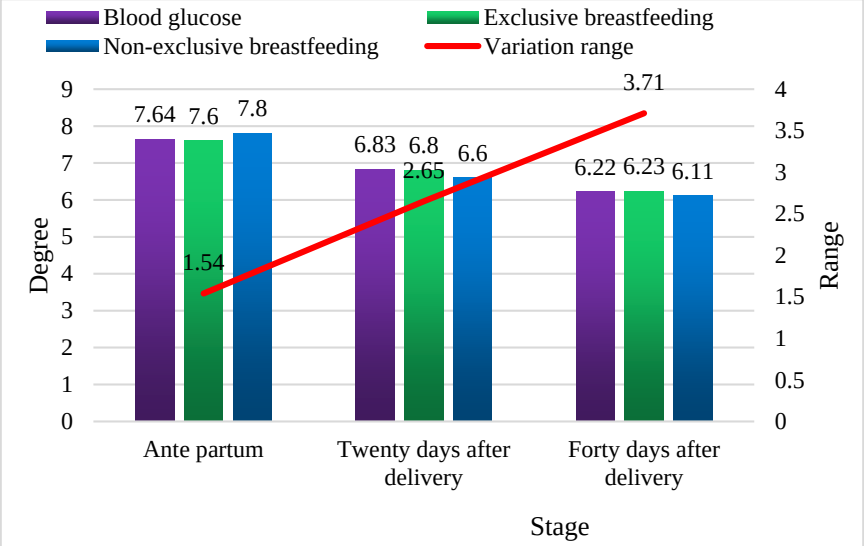

Figure 2: Blood Glucose Changes in GDM Patients

Through repeated analysis of variance, blood glucose levels were corrected before delivery, 20 days after delivery and 40 days after delivery (p<0.05). The difference of blood glucose at different time before and after delivery was statistically significant (p<0.001). Other paired comparisons

showed that the blood glucose level decreased significantly with the extension of recovery time, and the average blood glucose level at 20 and 40 days after birth was significantly lower than that before birth. See Table 1 for details:

As shown in Figure 2, we can see that the blood glucose level of breast-feeding pregnant women is 7.6 before delivery and 6.8 20 days after delivery. For non-breast-feeding pregnant women, the blood glucose level before delivery is 7.8, and the blood glucose level 20 days after delivery is 6.6. For the blood sugar level of diabetes patients before and after delivery, there was no statistical significance after breast-feeding and non breast-feeding.

4.2 Infant Development in Patients with Gestational Diabetes Mellitus

In this survey, the growth of the baby was taken as the basis for judgment. The weight, height and head circumference of newborn babies were observed and recorded. Then, after 20 days, the consultation was carried out through telephone follow-up, and the three indicators were recorded again. Then record the growth of the baby after 40 days. There was a statistically significant difference in weight change between breast-fed and non-breast-fed infants, but there was no significant difference in height and head circumference. The specific results are shown in Table 2:

Table 2: Infant Development in Patients with Gestational Diabetes Mellitus

	Weight	Height	Head circumference
Partum	3514	50.9	32.5
Twenty days after delivery	3950	52.4	34
Forty days after delivery	5401	55.1	36.2
Exclusive breastfeeding	0.015	0.156	0.16
Non-exclusive breastfeeding			

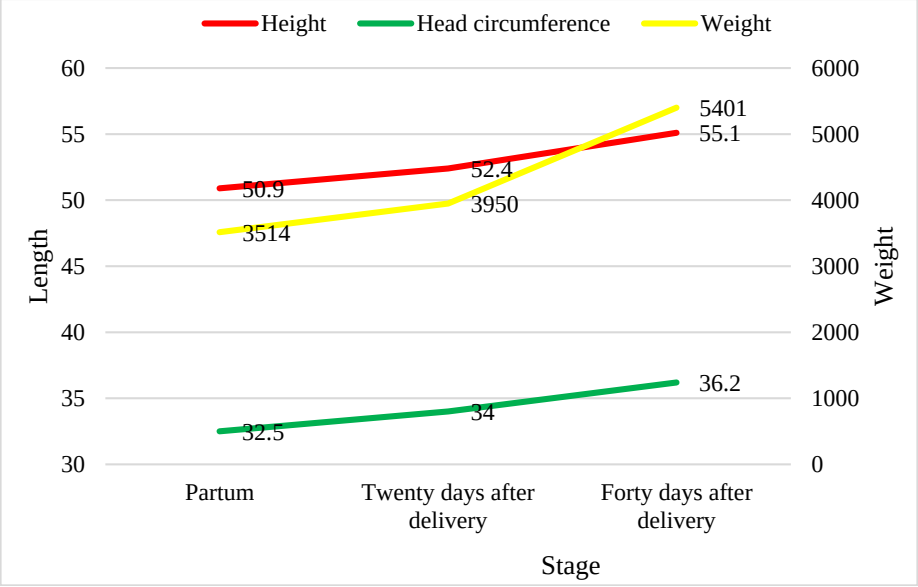

Figure 3: Infant Development in Patients with Gestational Diabetes Mellitus

As shown in Figure 3, we can see that the baby weight at delivery reaches 3514g, the baby weight after 20 days reaches 3950g, and the baby weight after 40 days reaches 5401g. The height of the baby at delivery reaches 50.9 cm, the height of the baby after 20 days reaches 52.4 cm, and the height of the baby after 40 days reaches 55.1 cm. The head circumference of infants at delivery reaches 32.5cm, 34cm after 20 days, and 36.2cm after 40 days.

4.3 Awareness of Complications and Fetal Effects Among Pregnant Women with Diabetes

The awareness rate of fetal malformation was 52%. The awareness rate of premature rupture of membranes was 26%. The awareness rate of macrosomia was 78%. The awareness rate of neonatal hypoglycemia was 43%. The awareness rate of postpartum hemorrhage was 22%. The awareness rate of fetal chronic intrauterine hypoxia is 29%. The awareness rate of hypertension during pregnancy was 87%. The awareness rate of obesity in offspring is 17%. See Table 3 for details:

Table 3: Awareness of Complications and Fetal Effects among Pregnant Women with Diabetes

	Number of people known	Unknown number
Fetal Anomaly	120	110
Premature Rupture of Fetal Membranes	60	170
Giant Baby	180	50
Hypoglycemia of Newborn	100	130
Postpartum Hemorrhage	50	180
Chronic Intrauterine Fetal Hypoxia	66	164
Hypertension during Pregnancy	200	30
The Odds of Offspring Obesity	40	190

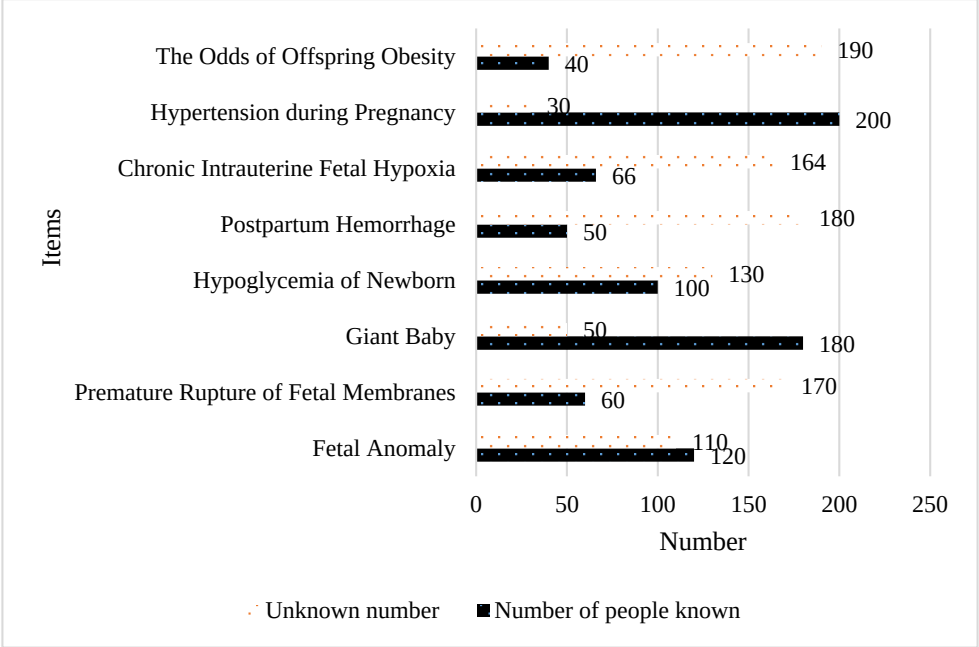

Figure 4: Awareness of Complications and Fetal Effects among Pregnant Women with Diabetes

As shown in Figure 4, we can find that the number of people who know about pregnancy hypertension, macrosomia and fetal malformation is greater than the number who do not know. This shows that these three complications and their effects are relatively common in pregnant women with diabetes. However, most people do not know that diabetes during pregnancy will lead to an increased risk of obesity in their offspring, which will lead to postpartum hemorrhage and chronic intrauterine hypoxia and asphyxia of the fetus. Some people do not know that pregnant women with diabetes will cause neonatal hypoglycemia.

5. Conclusion

GDM affects both mother and infant groups, and its occurrence is caused by many factors. It not only brings recent complications to mother and infant, but also brings long-term adverse effects to mother and infant. The purpose of this study is to explore the effects of glucose metabolism during pregnancy on the factors of abdominal infection, complications and their effects on infants and pregnant women, so as to provide theoretical basis for clinical treatment of medical staff. In this study, the relationship between pre pregnancy complications and quality of life indicators was analyzed by establishing the pregnancy diabetes self-evaluation scale and Kalman method. It was found that blood glucose control and insulin sensitivity can be used to intervene the disease.

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