

Effect of Individualized Care for Pregnant Women with Diabetes Mellitus

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Abstract: Gestational diabetes mellitus (GDM) is the first occurrence of diabetes mellitus after pregnancy due to abnormal maternal glucose metabolism pregnant women with obvious clinical symptoms, but they are prone to maternal infection, polyhydramnios, macrosomia, etc. A series of adverse pregnancy outcomes cause physical and mental harm to pregnant women and their families. Individualized care refers to the development of a care plan tailored to the needs of the individual in order to improve the effectiveness and adherence of treatment. The effect of individualized care on maternal blood glucose levels in GDM is significant. Individualized care can help pregnant women effectively control blood sugar levels and reduce adverse pregnancy outcomes. Through personalized care pairs 100 pregnant women were selected as study subjects and randomly divided into two groups. By comparing fasting blood glucose, individualized care can be effective in controlling blood glucose levels in pregnant women with GDM and reducing the incidence of adverse pregnancy outcomes.

Keywords: Gestational Diabetes Mellitus; Personalized Care; Fasting Plasma Glucose; 2-Hour Postprandial Glucose; Adverse Maternal and Fetal Outcomes

1. Introduction

Gestational diabetes mellitus (GDM) refers to diabetes that occurs for the first time during pregnancy and constitutes a distinct category of diabetes. It can lead to premature birth, fetal distress, or placental abruption, and most patients with GDM have hyperinsulinemia, posing a direct threat to the health of both mother and child [1]. With the continuous improvement of living standards, the incidence of GDM is also increasing year by year. Therefore,

effective and safe treatment measures are needed for these pregnant women, which has reduced the impact of the disease on the fetus and pregnant women. Pharmacotherapy is a common modality to control GDM, but it is difficult to achieve good glycemic control with medication alone. During drug therapy, appropriate, scientific nursing measures are required to stabilize blood glucose levels in pregnant women [2]. Most gestational diabetes goes away after delivery, but blood sugar levels need to be closely monitored after childbirth and the necessary steps to manage them to ensure the patient's health [3]. Conventional health education is not effective in helping pregnant women control blood glucose, and it is difficult to achieve an ideal level.

Individualized care can carry out different health education for pregnant women with different conditions, which can not only effectively improve the blood sugar level of pregnant women, but also guide pregnant women to form good eating habits, and at the same time ensure the physical and mental health of mothers and babies. In addition, hospitals also need to provide special care for newborns with gestational diabetes, especially some newborns may have hypoglycemia and other phenomena [3]. In view of the effect of this study on the implementation of individualized care for pregnant women with diabetes mellitus, the results of the study are reported as follows.

2. Information and Methodology

2.1 General Information

A total of 100 pregnant women with GDM who were admitted from January 2022 to January 2023 were selected and divided into two large groups by random blind selection, one group was the observation group of 50 cases, with an average age of 23~35 years, a

gestational age of 18~35 weeks, and an education level: 15 cases of high school, 23 cases of junior college, and 12 cases of undergraduate; One group was a control group of 50 cases, with an average age of 24~36 years, gestational age of 19~35 weeks, and education level: 10 cases of high school, 24 cases of junior college, and 16 cases of undergraduate. There was no significant difference between the two groups ($P>0.05$).

Inclusion Criteria: ① Meets diagnostic criteria for GDM; ② the patient's cognitive behavior was normal; ③ Signed informed consent; ④ The clinical data are complete and complete.

Exclusion Criteria: ① History of diabetes mellitus before pregnancy; ② Patients with malignant tumors; ③ Patients with infectious diseases; ④ with immune dysfunction; ⑤ Patients with liver, kidney, brain and other organ insufficiency; ⑥ Patients with neuromuscular diseases; ⑦ Patients with language communication disorders.

2.2 Methods of Care

The control group was given routine care, i.e., diabetes health care manuals were distributed, GMD-related knowledge was taught to pregnant women, regular telephone or WeChat follow-up visits were conducted for pregnant women, and knowledge about GMD was popularized in the corresponding WeChat groups, and blood glucose and blood pressure indicators of pregnant women were monitored in real time, and they were advised to start aerobic exercise appropriately.

Individualized care was given to the observation group and individualized care was provided on the basis of the control group.

Specific interventions are as follows:

① Set up a health education team, mainly composed of 1 department doctor, 2 nurses and 1 dietitian, to formulate individualized nutrition intervention programs for pregnant women, avoid excessive nutrient intake and blood sugar control, and also lay the foundation for pregnant women to form good dietary habits.

② Nutritional evaluation: Determine the fasting blood glucose before and after maternal nursing and the fluctuation of blood glucose 2 hours after meals, conduct a preliminary analysis based on the above indicators, judge whether the caloric intake of pregnant women exceeds the standard, and also change the maternal nutrition intervention program according to this indicator, so as to control blood glucose levels more effectively.

③ Health education: Nurses take the initiative to explain diabetes-related knowledge to pregnant women, and also explain GDM self-care measures. At the same time, the blood glucose self-monitoring standard is issued, the method of blood glucose measurement is explained, and the fasting blood glucose and 2-hour postprandial blood glucose value are recorded. Glycemic control criteria are no significant hunger, fasting blood glucose of 3.9 to 6.1 mmol/L, and 2-hour postprandial blood glucose of 3.89 to 7.8 mmol/L.

Advise women of the essentials of blood glucose measurement and return to the hospital every 14 days and every 7 days after 28 weeks' gestation until 48 hours postpartum. At the same time, his renal function indexes were measured and the fundus was examined at 32 weeks.

Doctors and dietitians work together to arrange a suitable diet plan for pregnant women based on their blood sugar levels and their own tastes and preferences. Instruct pregnant women to exercise moderately, mainly in aerobic mode, to avoid strenuous exercise and injury to the fetus. In this way, it helps pregnant women to deplete excess calories and blood sugar, so as to improve insulin sensitivity, reduce blood sugar levels, and reduce adverse maternal and infant outcomes.

④ Observe the changes of the labor process of pregnant women: when the mother tries labor in the vagina, the uterine opening is opened to 2cm to provide one-to-one midwifery service, guide the pregnant woman to give birth, and relieve the anxiety and nervousness of the pregnant woman in the delivery process.

⑤ Neonatal nursing: test the blood sugar of newborns and take corresponding nursing

measures. Newborns should be started as soon as possible after birth, whether breastfed or formula-fed, to ensure that they are getting enough nutrients to maintain their blood sugar levels.

2.3 Observe Indicators

① The fasting blood glucose and 2-hour postprandial blood glucose values of the two groups of pregnant women were counted separately

② The adverse maternal and infant outcomes of pregnant women in the two groups were mainly compared with gestational hypertension, polyhydramnios, postpartum hemorrhage, and macrosomia.

2.4 Statistical Analysis Using SPSS Statistics Version 27.0.

The independent samples t-test was used for comparison between groups, and the Levene

test was used for homogeneity of variance. The χ^2 test was used for comparison between groups. The significance level of the test was 0.05 (two-sided). $P < 0.05$ was statistically significant.

3. Results

3.1 Blood Glucose Indicators before and after Treatment for Pregnant Women

There was no statistically significant difference in fasting blood glucose and 2-hour postprandial blood glucose between the two groups before nursing (all $P > 0.05$). The fasting blood glucose and 2-hour postprandial blood glucose of pregnant women with GDM in the post-nursing observation group were lower than those in the control group, and the differences were statistically significant (all $P < 0.05$) (Table 1).

Table 1 Comparison of Blood Glucose Indicators between the Two Groups of GDM Pregnant Women Before and After Nursing ($\bar{X} \pm S$, mmol/L)

	Instances	Fasting blood glucose		Postprandial blood glucose 2 hours	
		Before treatment	After treatment	Before treatment	After treatment
Observation	50	5.70±1.26	5.26±0.67	8.40±1.16	6.78±0.65
Control	50	5.93±1.14	5.73±0.92	8.02±1.26	7.54±0.74
t-value	—	-0.952	-2.956	1.533	-5.492
P-value	—	0.344	0.004	0.128	<0.001

3.2 Adverse Maternal and Infant Outcomes

The incidence of adverse pregnancy outcomes in the observation group was 24.00%, and the incidence of adverse

pregnancy outcomes in the control group was 70.00%, and the incidence of adverse pregnancy outcomes in the observation group was lower than that in the control group ($P < 0.05$) (Table 2).

Table 2. Comparison of Adverse Pregnancy Outcomes between the Two Groups of Pregnant Women with GDM [n (%)]

Constituencies	Instances	Gestational hypertension	hydramnios	Postpartum hemorrhage	macrosomia	Adverse pregnancy outcomes
Observation	50	4(8.00)	0(0.00)	5(10.00)	3(6.00)	12(24.00)
Control	50	10(20.00)	6(12.00)	12(24.00)	7(14.00)	35(70.00)
χ^2 -value	—					21.236
P-value	—					<0.001

4. Discussion

GDM is diabetes mellitus that occurs for the first time due to abnormal maternal glucose metabolism after pregnancy, and is one of the common comorbidities in pregnancy, often without obvious clinical symptoms. At present, people's living standards are becoming more and more ideal, and pregnant women's diet and lifestyle are

gradually changing, resulting in an increasing risk of gestational diabetes, which affects maternal and infant safety and health education is an important intervention method for pregnant women with GDM, which can not only enable pregnant women to master the knowledge of the disease, but also greatly improve their self-care ability [4, 5].

Personalized service is a new type of

nursing model, which is patient-centered, emphasizing the provision of high-quality nursing services to pregnant women from the psychological, social, and physiological levels, and formulating personalized service plans based on the actual situation of pregnant women, and through dynamic monitoring of pregnant women's blood glucose levels, abnormal blood glucose fluctuations can be detected in time, so as to take effective treatment measures, control blood glucose levels, and ensure the health and safety of pregnant women [6-8]. At the same time, personalized care can help pregnant women to carry out psychological counseling, effectively guide pregnant women to face the disease head-on, make pregnant women maintain a positive and optimistic attitude, improve maternal compliance with nursing, and improve pregnancy outcomes.

Individualized care can be used to educate pregnant women with GDM about the disease and dietary considerations, so that they can control blood glucose levels more effectively [9]. The results of this study showed that the fasting blood glucose and 2-hour postprandial blood glucose of the observation group were lower than those of the control group ($P < 0.05$), which was mainly because personalized care could make pregnant women realize healthy behavior habits and effectively control blood glucose levels, so as to cultivate healthy living and eating habits.

At the same time, regular monitoring of blood glucose levels can effectively monitor the dietary habits of pregnant women in the near future, and then personalized guidance can be carried out to ensure that maternal blood sugar is within a controllable range. Formulating a personalized diet plan to guide pregnant women to eat a reasonable diet to maintain maternal nutritional status and strengthen exercise training can promote pregnant women to improve their own immunity and facilitate smooth delivery; At the same time, better communication with pregnant women can maximize the needs of pregnant women to provide the care services they need [10, 11]. In addition, through communication and collaboration with pregnant women in the process of personalized nursing, the

education results can be fed back in a timely and effective manner, and the knowledge of pregnant women about gestational diabetes can be further mastered, and through discussion and analysis of the reasons why pregnant women do not grasp it, strengthen the weak parts, optimize the education methods, so that pregnant women can find their own health education methods, and then can effectively control their own blood sugar levels.

It is important to note that pregnant women with gestational diabetes have a higher risk of delivery than the general population, the potential for complications such as preterm birth or postpartum hemorrhage, and even adverse events such as fetal distress [11].

The results of this study showed that the incidence of adverse maternal and infant outcomes in the observation group was lower than that in the control group ($P < 0.05$), mainly because personalized care can reduce the occurrence of adverse maternal and infant outcomes in pregnant women with GDM. In the early stage, effective control of blood glucose levels, reasonable dietary management, and scientific exercise can increase the sensitivity of insulin in pregnant women with GDM, so that blood glucose can drop and promote nutrient metabolism in pregnant women, and effectively reduce the incidence of adverse maternal and infant outcomes.

At the same time, personalized care also enables pregnant women to understand the relevant GMD knowledge, improves the awareness of maternal protection of themselves and the fetus, and explains to pregnant women in advance the situation that may occur in the treatment, so that they can be prepared for the complications that may occur in the process of treatment, so that they can actively participate in the nursing work, and also improve the nursing effect.

For newborns born with gestational diabetes, the blood glucose level of the newborn is generally concerned and blood glucose monitoring is required if necessary. Once the newborn has symptoms of hypoglycemia, it is easy to cause irreversible damage to the newborn's brain cells. Therefore, it is necessary to pay

enough attention.

5. Conclusion

Personalized care can effectively improve the blood glucose level of pregnant women, develop good behavioral habits, and reduce the outcome rate of adverse mothers and babies according to the characteristics and disease conditions of GDM pregnant women, which can be promoted.

The significance of personalized care promotion is to help GDM pregnant women control blood glucose levels, reduce the incidence of complications, and ensure the health of mothers and babies. The promotion of personalized care can also improve the humanistic knowledge and professional ability of medical staff, enhance the care and attention of medical workers to patients and families, and further improve the quality of medical services.

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