Effects of Psychological Nursing Combined with Exercise Therapy on Patients with Gestational Diabetes Mellitus

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ABSTRACT

Objective: To assess the effects of psychological nursing combined with exercise therapy on patients with gestational diabetes mellitus.

Methods: A total of 80 patients with gestational diabetes mellitus who were treated in our hospital from January 2017 to June 2019 were enrolled and randomly divided into two groups (n=40 per group) using a random number table. Patients in control group were given routine nursing, while those in observation group were given psychological nursing and exercise therapy based on the treatment in control group. The blood glucose levels, insulin resistance index, incidence rate of adverse pregnancy outcomes, negative emotion scores and nursing satisfaction were compared between the two groups.

Results: In contrast with those before nursing, the levels of fasting blood glucose and 2-hour postprandial blood glucose and insulin resistance index declined after nursing in both groups (P<0.05), and they were lower in observation group than those in control group after nursing (P<0.05). The incidence rate of adverse pregnancy outcomes was lower in observation group than that in control group (5.00% *vs.* 20.00%, P<0.05). Compared with those before nursing, the SAS and SDS scores dropped in both groups after nursing (P<0.05), and they were lower in observation group than those in control group (P<0.05). The total satisfaction rate of nursing was higher in observation group than that in control group (95.00% *vs.* 80.00%, P<0.05).

Conclusion: The application of psychological nursing combined with exercise therapy in treating gestational diabetes mellitus can effectively control the blood glucose level during pregnancy, reduce insulin resistance in the body, decrease adverse pregnancy outcomes, and relieve the negative emotion of patients, making the patients more satisfied with the nursing service.

KEYWORDS: gestational diabetes mellitus; psychological nursing; exercise therapy

INTRODUCTION

Gestational diabetes mellitus is a unique complication of pregnancy, with a relatively high incidence rate. Disorder of blood glucose level in pregnant women easily increases the risk of pregnancy and causes adverse pregnancy outcomes, endangering maternal and infant safety. Therefore, it is necessary to carry out active

intervention on gestational diabetes mellitus [1-3]. After the occurrence of gestational diabetes mellitus, patients are affected by the disease status and often have a negative emotion, so they are not very cooperative with blood glucose control measures. Besides, some patients have considerable increase in body weight during pregnancy, which is not conducive to blood glucose control. Therefore, it is also necessary to take nursing measures for patients with gestational diabetes mellitus in clinics. Psychological nursing is a nursing measure specifically aiming at psychological risk factors, while exercise therapy is the major intervention method to regulate the physical function of patients or control their body weight, both of which are highly targeted. To explore the effect of psychological nursing

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combined with exercise therapy in the nursing of patients with gestational diabetes mellitus, 80 patients with gestational diabetes mellitus who were treated in our hospital from January 2017 to June 2019 were selected for this randomized controlled study.

MATERIALS AND METHODS
General information

A total of 80 patients with gestational diabetes mellitus who were treated in the Obstetrics Department of our hospital from January 2017 to June 2019 were enrolled and randomly divided into two groups (n=40 in each group) using a random number table. In control group, there were 31 primiparas and 9 multiparae aged 21-35 years old, with an average age of (29.32 ± 4.62) years old, and weighing 51-77 kg, with an average of (65.62 ± 10.66) kg, and the gestational age was 24-28 weeks, with a mean of (26.05 ± 1.46) weeks. In observation group, there were 32 primiparas and 8 multiparae aged 20-35 years old, with an average of (29.18 ± 4.70) years old, and weighing 50-78 kg, with an average of (65.45 ± 10.39) kg, and the gestational age was 24-28 weeks, with a mean of (26.11 ± 1.43) weeks. No statistically significant differences were observed in the age, gestational age, body weight and previous fertility status between the two groups (P>0.05), and they were comparable. This study was approved by the Medical Ethics Committee, and all subjects signed the informed consent.

Inclusion criteria: (1) Patients who were diagnosed with gestational diabetes mellitus in accordance with the diagnostic criteria of gestational diabetes mellitus in the *Guidelines for the Diagnosis and Treatment of Gestational Diabetes Mellitus (2014)*, (2) those who conceived naturally, with a singleton pregnancy showed in B-ultrasound, (3) those who were conscious, and (4) those with an age ≥18 years old.

Exclusion criteria: (1) Patients with a history of type 1 or type 2 diabetes mellitus before pregnancy, (2) those with cognitive or mental disorders, or (3) those who were lost to follow-up or dropped out of the study.

Methods

Patients in control group received routine nursing. The correct use of hypoglycemic drug was explained for the patients, and the importance of taking drugs according to the doctor's orders was emphasized. Besides, prenatal precautions were illustrated for patients, diet control was emphasized, and its importance was expounded for the patients. Moreover, the nursing staff worked with the patients to formulate a scientific and reasonable dietary nutrition plan during pregnancy, with a dietary principle of eating multiple small meals regularly, choosing foods that were easy to digest and rich in high quality proteins, and strictly limiting the daily intake of sodium, fat, sugar and other substances.

Based on the routine nursing in control group, patients in observation group received psychological nursing and exercise therapy, specifically as follows: (1) Psychological nursing: The nursing staff communicated with the patients according to their age and education level, analyzed the sources of psychological problems and stress, and enlightened them based on these. Besides, the nursing staff told the patients that "there is no need to worry too much about the disease status. Blood glucose can be controlled by insulin injection and oral hypoglycemic drugs" and make them realize the importance of active cooperation in treatment. (2) Exercise therapy: The importance of exercise was explained to the patients, and the nursing staff together with the patients chose the exercise methods that were suitable for the patients according to their personal physique, exercise ability and preferences. Exercises such as the upper limb exercise and walking were preferred. The nurses or family members of the patients urged the patients to exercise at least 3 times a day, 15 min/time, on condition that the patients were able to tolerate it.

Observation Indices

The following items were compared between the two groups. (1) Blood glucose levels: The levels of fasting blood glucose and 2-hour postprandial blood glucose were determined by the glucose oxidase method using kits purchased from Nova Biomedical Corporation., Ltd. (2) Insulin resistance index: Fasting insulin level was measured by chemiluminescence method. The detection kit was purchased from Nova (USA). The insulin resistance index was calculated according to the formula below: Insulin resistance index = fasting insulin level × fasting blood glucose level /22.5. (3) The incidence rate of adverse pregnancy outcomes such as fetal distress, macrosomia, postpartum hemorrhage and puerperal infection was determined. (4) Negative emotion scores: The Self-rating Anxiety Scale (SAS) and Self-rating Depression Scale (SDS) were used for scoring the negative emotion, ranging 0-100 points, and the scores were proportional to the severity of negative emotion [4]. (5) Nursing satisfaction: A self-made

nursing satisfaction questionnaire was used for scoring the nursing satisfaction (total score = 100 points, 81-100 points = very satisfied, 60-80 points = generally satisfied, and 0-59 points = dissatisfied). The total satisfaction rate was the sum of the proportions of "very satisfied" and "generally satisfied".

Statistical Analysis

SPSS 22.0 software was employed. The numerical data were expressed as (n) and subjected to χ^2 test, and the quantitative data were expressed as ($\bar{\chi} \pm s$) and examined by t test. P<0.05 suggested that the difference was statistically significant.

RESULTS

Blood glucose levels

Compared with those before nursing, the levels of fasting blood glucose and 2-hour postprandial blood glucose declined in both two groups after nursing (P<0.05), and they were lower in observation group than those in control group (P<0.05) (Table 1).

Insulin resistance indices

Compared with that before nursing, the insulin resistance index was reduced in both groups after nursing (P<0.05), and it was lower in observation group than that in control group (P<0.05) (Table 2).

Incidence rates of adverse pregnancy outcomes

The incidence rate of adverse pregnancy outcomes was lower in observation group than that in control group (5.00% *vs.* 20.00%, P<0.05) (Table 3).

Negative emotions scores

Compared with those before nursing, the SAS and SDS scores dropped after nursing (P<0.05), and they were lower in observation group than those in control group (P<0.05) (Table 4).

Nursing satisfaction rate

The total satisfaction rate of nursing was higher in observation group than that in control group (95.00% *vs.* 80.00%, P<0.05) (Table 5).

DISCUSSION

Gestational diabetes mellitus mainly refers to the diabetes mellitus developed in pregnant women who have no history of diabetes mellitus before pregnancy. With the occurrence of gestational diabetes mellitus, the metabolism in pregnant women changes, and their blood glucose level increases, triggering endocrine disorder, easily affecting the maternal and infant safety, and thus leading to adverse pregnancy outcomes [5-7].

Ideal blood glucose status is the key to ensuring the safety of mothers and infants with gestational

diabetes mellitus. Therefore, it is very important to control the blood glucose of patients with gestational diabetes mellitus. The clinical treatment of gestational diabetes mellitus mainly includes oral hypoglycemic drugs, insulin and so on. Oral hypoglycemic drugs or insulin injection can effectively control the blood glucose level of patients. However, some patients with gestational diabetes mellitus are affected by a variety of factors during treatment, and they are prone to a negative emotion, so their willingness of cooperating in blood glucose control is reduced [8]. In view of the negative emotion of patients with gestational diabetes mellitus, it is advocated to conduct psychological nursing for patients in clinics. Psychological nursing is a nursing measure specially implemented for psychological problems, and its programs are highly targeted, which can help relieve the negative emotion of patients and promote their activity of cooperation in blood sugar control [9-11]. Blood glucose level is closely associated with the body weight of patients with gestational diabetes mellitus. Therefore, patients with obesity or excessive weight gain during pregnancy have a higher risk of gestational diabetes mellitus. In response to this, it is advocated to control the body weight of patients with gestational diabetes mellitus. Exercise therapy is an important measure for weight control of patients with gestational diabetes mellitus. By instructing patients to exercise regularly, the body function of the patients can be enhanced effectively, and the weight gain can be controlled, so as to prevent aggravation of disease in patients due to excessive weight gain during pregnancy [12-14]. The results of this study are summarized below. After nursing, the levels of fasting blood glucose, 2-hour postprandial blood glucose and insulin resistance index were lower in observation group than those in control group (P<0.05), indicating that psychological nursing combined with exercise therapy can improve the effect of blood glucose control and enhance the insulin resistance level in patients. Observation group had a lower incidence rate of adverse pregnancy outcomes than control group (5.00% *vs.* 20.00%, P<0.05), suggesting that psychological nursing and exercise therapy can reduce the risk of adverse outcomes in mothers and infants through stable control of blood glucose level. The SAS and SDS scores were reduced in observation group compared with those in control group (P<0.05), and the total satisfaction rate of nursing was raised in observation group in comparison with that in control group (95.00% *vs.* 80.00%, P<0.05), implying that psychological

nursing and exercise therapy can relieve the negative emotion of patients. This is mainly because psychological nursing aims at solving psychological problems directly, while exercise therapy can improve the physical health and reduce the impact of disease status on patients' daily life through long-term exercise.

To sum up, the application of psychological nursing combined with exercise therapy in the treatment of gestational diabetes mellitus can effectively control the blood glucose level during pregnancy, decrease insulin resistance in the body, reduce the adverse pregnancy outcomes, and relieve the negative emotion of patients, making the patients more satisfied with nursing services.

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Table 1. **Blood glucose levels ($\bar{\chi}$ ± s, mmol/L)**

Group	Time	Fasting blood glucose	2-hour postprandial blood glucose
Control (n=40)	Before nursing	9.12±1.54	12.74±2.08
	After nursing	7.58±1.19[#]	10.69±1.65[#]
Observation (n=40)	Before nursing	9.08±1.52	12.67±2.10
	After nursing	5.45±1.03[#*]	8.56±1.27[#*]

[#]P<0.05 *vs.* before nursing within the same group. [*]P<0.05 *vs.* control group.

Table 2. **Insulin resistance indices ($\bar{\chi}$ ± s)**

Group	Insulin resistance index	
	Before nursing	After nursing
Control (n=40)	2.56±0.45	2.13±0.37[#]
Observation (n=40)	2.50±0.47	1.71±0.32[#*]

[#]P<0.05 *vs.* before nursing within the same group. [*]P<0.05 *vs.* control group.

Table 3. **Incidence rates of adverse pregnancy outcomes [n (%)]**

Group	n	Fetal distress	Macrosomia	Postpartum hemorrhage	Puerperal infection	Total incidence rate
Control	40	2 (5.00%)	1 (2.50%)	3 (7.50%)	2 (5.00%)	8 (20.00%)
Observation	40	0 (0%)	0 (0%)	1 (2.50%)	1 (2.50%)	2 (5.00%) *

[#]P<0.05 *vs.* before nursing within the same group. [*]P<0.05 *vs.* control group.

Table 4. **Negative emotion scores ($\bar{\chi}$ ± s, point)**

Group	Time	SAS score	SDS score
Control (n=40)	Before nursing	54.57±6.91	55.28±6.74
	After nursing	47.23±5.47[#]	48.37±5.86[#]
Observation (n=40)	Before nursing	54.43±6.95	55.16±6.80
	After nursing	41.68±4.83[#*]	42.40±5.19[#*]

[#]P<0.05 *vs.* before nursing within the same group. [*]P<0.05 *vs.* control group.

Table 5. **Nursing satisfaction rates [n (%)]**

Group	n	Very satisfied	Generally satisfied	Dissatisfied	Total satisfaction rate
Control	40	16 (40.00%)	16 (40.00%)	8 (20.00%)	32 (80.00%)
Observation	40	20 (50.00%)	18 (45.00%)	2 (5.00%)	38 (95.00%) *

[*]P<0.05 *vs.* control group.