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Original Article

Comprehensive nursing on postpartum complications and negative emotions of patients with pregnancy induced hypertension syndrome

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Abstract: Objective: The aim of the current study was to investigate the effects of comprehensive nursing intervention on postpartum complications and negative emotions of patients with pregnancy induced hypertension syndrome (PIH). Methods: A total of 168 cases of patients with pregnancy induced hypertension syndrome were prospectively analyzed. They were randomly divided into group A (N = 84) and group B (N = 84). Patients in group A received routine nursing, while patients in group B additionally received comprehensive nursing. Self-rating Depression Scale (SDS) scores, Self-Rating Anxiety Scale (SAS) scores, diastolic pressure levels, and systolic pressure levels of the two groups were observed before and after nursing. Postpartum hospitalization times, medical expenses, nursing satisfaction, and incidence of complications of the two groups were compared. Results: After nursing, diastolic pressure levels, systolic pressure levels, SDS scores, and SAS scores of the two groups were significantly lower than those before nursing (all $P < 0.05$). Improvements in diastolic pressure, systolic pressure, SDS scores, and SAS scores of group B were significantly better than those of group A (all $P < 0.05$). Changes in diastolic pressure, systolic pressure, SDS scores, and SAS scores of group A were significantly less than group B (all $P < 0.05$). Additionally, group B exhibited shorter hospitalization times, lower medical expenses, and higher nursing satisfaction, compared to group A ($P < 0.05$). Conclusion: Comprehensive nursing intervention can effectively improve blood pressure, anxiety, and depression levels in patients with PIH. It can also reduce hospitalization times, medical expenses, and complication incidence rates, as well as improve nursing satisfaction levels.

Keywords: Comprehensive nursing, pregnancy induced hypertension syndrome, complications

Introduction

Pregnancy induced hypertension is a common gynecologic disease during the gestation period. More women, advanced in maternal age, have become pregnant due to the two-child policy in China. This is an important reason for increased incidence rates of PIH in recent years.

PIH can prevent the placenta from receiving enough blood, causing low birth weights in babies [1]. PIH may cause various complications, including placental abruption, a complication that occurs when the placenta pulls away from the wall of the uterus. This causes maternal bleeding, fetal distress, seizures in the mother, and early deliveries [2]. At present, the specific pathogenesis of PIH remains unknown. There are no specific treatments. However, PIH is monitored closely, aiming to rapidly identify pre-eclampsia and life-threatening complications [3]. Therefore, carrying out early intervention during pregnancies is particularly important in reducing PIH incidence and complications [4].

After obtaining PIH, patients easily developed anxiety, depression, and other adverse emotions. These emotions affect normal pregnancies. One study examining women with PIH revealed significantly more conflict-shaken pregnancies. There were severe conflicts with relevant third persons. Most of the women reported a rather disturbed relationship with their physician. Weak expression of emotions

was also observed. [5] Another study found that pregnant women with PIH experience higher stress levels, compared to non-pregnant women and healthy pregnant women. Negative emotions due to stress will affect pregnancy outcomes [6].

Various studies have shown [7] that nursing intervention can effectively reduce negative emotions of patients. It can also reduce the risk of postpartum complications. Comprehensive nursing was originally proposed by the United States as a management model. With years of optimization and improvements, comprehensive nursing has played a crucial role in many kinds of diseases [8, 9].

Nurses have the unique opportunity to identify signs and symptoms that characterize the evolution of this specific pathology. Thus, they can implement interventions even before complications occur [10]. The current study investigated the effects of comprehensive nursing on adverse emotions and postpartum complications of PIH patients, aiming to provide reference for clinical nursing.

Methods and materials

Clinical data of 168 patients with PIH were collected. The patients received treatment from May 2014 to July 2015. They were randomly divided into group A (N = 84) and group B (N = 84), according to a random number table. In group A, the age range was 23-45 years old, with an average age of 31.5 ± 4.8; In group B, the age range was 21-48 years old, with an average age of 31.9 ± 5.3. Inclusion criteria: Patients conformed to the diagnosis criteria of PIH [11]; Women aged over 21 years, with 20 weeks of gestation; Patients willing to participate in this study. Exclusion criteria: Patients with malignant tumors; Patients with congenital cardiovascular and cerebrovascular defects; Patients with pre-pregnancy hypertension history; Patients with immunodeficiency diseases; Patients with mental disorders. The current study was approved by the Medical Ethics Committee of the People's Hospital of Yan'an.

Nursing

Routine nursing was carried out in group A. Symptomatic treatment was carried out according to specific conditions of the pregnant women. Nursing staffs should understand the pregnancy process. They should monitor fetal heart conditions. If necessary, nursing staffs should monitor fetal heart rates, as well as arrange maternity beds and notify doctors to rescue the patients timely. Nursing staffs prepared preliminary assessments on the pregnant women. They informed the pregnant women and their families of the hospitalization environment and instructions. Health publicity and education were also carried out. Body temperatures, pulses, and breathing rates were detected each day. Fetal movement was evaluated each day. Weights were measured when patients were admitted to the hospital. If the weights could not be measured, "flat car" was used or "in bed" was marked.

Comprehensive nursing intervention was carried out in group B, including health education, psychological intervention, basic nursing, dietary guidance, medication guidance, and delivery care [12]. Health education: Pregnant women were organized and given weekly health lectures. Through electronic, written, and video information, the harmful nature of PIH and matters needing attention were introduced. The pregnant women were advised to make a schedule, performing proper outdoor exercise and developing correct sitting and lying postures. These help to avoid panic during childbirth. Psychological intervention: Most pregnant women show fear, anxiety, depression, and other negative emotions when they know the condition of the disease. This impacts treatment effect. It is necessary to conduct psychological counseling timely, answering doubts and questions, one by one, according to the actual situation. This can help the pregnant women to fully understand their current physical condition, reducing negative emotions and improving treatment effects. Basic nursing: Close attention should be paid to blood pressure, urine volume, respiration, and other vital signs. Specific changes are observed to ensure timely nursing and treatment. Dietary guidance: Three meals are designed according to the specific physical conditions of the women. The pregnant women should have more fruits, vegetables, and foods rich in micronutrients, ensuring daily required calories, fats, proteins, and carbohydrates. Weight changes of the pregnant women were observed. Medication guidance: The pregnant women are instructed

Table 1. Comparison of clinical data between two groups

Factor	Classify	A group (n = 84)	B group (n = 84)	χ^2/t value	*P* value
Age (years)		31.5 ± 4.8	31.9 ± 5.3	0.513	0.609
BMI (kg/m^2)		21.32 ± 1.84	20.85 ± 2.13	1.530	0.128
Amniotic fluid index (mm)		112.84 ± 27.54	115.44 ± 31.22	0.572	0.568
Fasting blood glucose (mmol/L)		4.68 ± 0.75	4.80 ± 0.69	1.079	0.280
2 h postprandial blood glucose (mmol/L)		6.82 ± 1.44	7.02 ± 1.47	0.891	0.374
Birth weight (kg)		68.54 ± 6.25	71.53 ± 6.82	2.962	0.004
Weight gain (kg) during pregnancy		16.84 ± 3.25	16.28 ± 3.61	1.057	0.292
Smoking history	Yes	18 (21.43)	24 (28.57)	1.143	0.285
	No	66 (78.57)	60 (71.43)		
History of alcoholism	Yes	7 (8.33)	5 (5.95)	0.359	0.549
	No	77 (91.67)	79 (94.05)		
Production status	I-para	50 (59.52)	44 (52.38)	0.870	0.351
	multipara	34 (40.48)	40 (47.62)		
Number of pregnancies (times)	≥ 2	32 (38.10)	34 (40.48)	0.099	0.752
	< 2	52 (61.90)	50 (59.52)		
Degree of education	≥ Senior middle school	50 (59.52)	53 (63.10)	0.226	0.635
	< Senior middle school	34 (40.48)	31 (36.90)		

to take medicine timely, according to doctor's advice. They should increase the intake of vitamins and calcium. Delivery care: This is to ensure complete equipment during childbirth. Supplements should be given timely if incomplete or exhausted. Real-time attention should be paid to changes in vital signs. If there is an emergency, it should be reported to the attending physician promptly, aiming to reduce occurrence rates of adverse pregnancy outcomes.

Outcome measures

Main outcome measures: Self-Rating Depression Scale (SDS) is a 20-item self-reported questionnaire. Each item is scored on a Likert scale, ranging from 1 to 4. A total score is derived by summing the individual item scores, ranging from 20 to 80. Most patients have depression scores between 50 and 69. Scores of 70 and above indicate severe depression.

Self-Rating Anxiety Scale (SAS) is also a 20-item self-reported assessment device built to measure anxiety levels. It is based on scoring in 4 groups of manifestations, including cognitive, autonomic, motor, and central nervous system symptoms. The total raw scores range from 20-80. Higher scores indicate higher levels of anxiety.

SDS and SAS were measured before and one month after nursing.

Diastolic blood pressure and systolic blood pressure levels of two groups were observed before and 3 months after nursing with a single test.

Secondary Outcome measures: Postpartum hospitalization times, medical expenses, incidence of complications, and nursing satisfaction levels were measured using self-made questionnaires in the hospital. Satisfaction % = (very satisfied + satisfied)/total*100%].

Statistical analysis

Statistical analysis was carried out using SPSS 20.0 (Shanghai Kabe) statistical software. GraphPad Prism 5 was used to plot data after analysis. Measurement data are expressed as mean ± standard error (mean ± SD). Independent t-tests were used for comparisons between groups and paired t-tests were used for comparisons before and after nursing care. Count data are expressed as percentages (%) and X^2 tests were used. $P < 0.05$ indicates statistical significance.

Results

Comparison of baseline clinical data

There were no significant differences in clinical data between the two groups ($P > 0.05$), except for weight ($P < 0.05$) (**Table 1**).

Table 2. Diastolic and systolic blood pressure levels in the two groups before and after nursing care (mm Hg)

Group	Systolic pressure				Diastolic pressure			
	Before nursing care	After nursing care	t	P	Before nursing care	After nursing care	t	P
A group (n = 84)	158.01 ± 10.26	141.87 ± 8.37*	11.436	< 0.001	99.12 ± 3.94	93.52 ± 7.45*	5.655	< 0.001
B group (n = 84)	157.33 ± 9.22	129.31 ± 5.51*	32.072	< 0.001	98.85 ± 3.67	83.71 ± 5.91*	18.629	< 0.001
t	0.452	11.488			0.613	9.455		
P	0.652	< 0.001			0.541	< 0.001		

Note: *there was a difference between before and after nursing (P < 0.05).

Table 3. Changes in diastolic blood pressure and systolic blood pressure differences between the two groups before and after nursing care (mm Hg)

Group	Systolic pressure difference	Diastolic pressure difference
A group (n = 84)	16.13 ± 11.49	5.60 ± 3.58
B group (n = 84)	28.02 ± 15.85	15.14 ± 5.88
t value	5.567	12.701
P value	< 0.001	< 0.001

Changes in diastolic pressure and systolic pressure of the two groups

Diastolic blood pressure and systolic blood pressure levels of two groups were measured before and after nursing. After nursing, diastolic blood pressure and systolic blood pressure levels of both groups were significantly lower than those before nursing (all P < 0.05). After nursing, improvements in diastolic and systolic blood pressure levels in group B were significantly better than those in group A (all P < 0.05). According to diastolic and systolic blood pressure changes results, changes in diastolic and systolic blood pressure levels of group A were significantly less than those in group B (all P < 0.05) (**Tables 2** and **3**).

Changes in SDS and SAS scores of the two groups

Evaluating SDS and SAS scores of the two groups before and after nursing, SDS and SAS scores of both groups were significantly lower than those before nursing (all P < 0.05). After nursing, improvements in SDS and SAS scores of group B were significantly better than those of group A (all P < 0.05). According to SDS and SAS change results, changes in SDS and SAS scores of group A were significantly less than those of group B (all P < 0.05) (**Tables 4** and **5**).

Comparison of postpartum hospitalization times, medical expenses, nursing satisfaction, and total incidence of complications

Postpartum hospitalization times of group A were significantly higher than those of group B (P < 0.05). Medical expenses of group A were significantly higher than those of group B (P < 0.05). Total incidence rates of complications of group B were significantly lower than those of group A (P < 0.001). Satisfaction degrees of group B were significantly higher than those of group B (P < 0.05) (**Tables 6**-**8**, and **Figure 1**).

Discussion

Without timely intervention, risks of premature deliveries, cesarean sections, and postpartum hemorrhaging will increase in PIH patients [13]. At present, the main risk factors for PIH include hypertension, insulin resistance, inflammation, and obesity. These factors can be intervened through advanced intervention [14, 15].

Advanced nursing intervention can effectively reduce incidence of adverse reactions [16, 17]. At present, routine nursing cannot meet the requirements of patients. Comprehensive nursing is a nursing mode based on evidence-based medicine. It can be adjusted according to patient conditions, providing more precise nursing. Comprehensive nursing reduces patient psychological and physiological burdens, as well as risk of complications. It also shortens recovery times and unnecessary patient loss [18]. Therefore, the current study carried out comprehensive nursing intervention on PIH patients. Improvement effects on incidence of postpartum complications and negative emotions of PIH patients were observed.

PIH patients often suffer from negative emotions, such as anxiety and depression. These negative emotions affect therapeutic effects.

Table 4. SAS and SDS scores before and after nursing care

Group	SDS score				SAS score			
	Before nursing	After nursing	t	P	Before nursing	After nursing	t	P
A group (n = 84)	61.22 ± 6.67	39.84 ± 8.47*	12.300	< 0.001	68.47 ± 5.17	47.24 ± 6.39*	26.384	< 0.001
B group (n = 84)	62.15 ± 6.90	34.16 ± 7.09*	23.870	< 0.001	68.51 ± 4.58	41.63 ± 5.16*	41.443	0.001
t value	0.882	4.713			0.958	6.260		
P value	0.379	< 0.001			0.053	< 0.001		

Note: *there was a difference between before and after nursing (P < 0.05).

Table 5. Changes in SDS and SAS score differences between the two groups before and after nursing care

Group	SDS score difference	SAS score difference
A group (n = 84)	21.38 ± 10.67	21.23 ± 8.93
B group (n = 84)	27.99 ± 8.99	26.88 ± 7.22
t	4.342	4.509
P	< 0.001	< 0.001

Table 6. Comparison of postpartum hospitalization times and treatment costs between the two groups

Group	Postpartum hospital stays (d)	Medical expenses (RMB)
A group (n = 84)	6.86 ± 2.02	3505.09 ± 547.02
B group (n = 84)	4.68 ± 1.88	2535.62 ± 423.15
t	7.240	12.848
P	< 0.001	< 0.001

Moreover, patients develop a great amount of psychological pressure, which may cause insomnia. This will aggravate compression of the uterus on the abdominal aorta, often causing high blood pressure [19]. The most simple and direct assessment methods concerning anxiety and depression, SDS and SAS scores can directly reflect patient anxiety and depression levels [20, 21]. After nursing intervention, SDS and SAS scores of two groups were improved effectively. Results suggest that nursing intervention can improve negative emotions of patients. Differences in SDS and SAS scores in group B were significantly higher than those in group A. This suggests that comprehensive nursing intervention was more effective than routine nursing intervention in improving negative emotions. The main reason is that the psychological pressure of patients can be relieved through psychological nursing and health education, applied in comprehensive nursing. Moreover, doubts and problems of the patients can be also solved [22]. Health education allows patients to have a better understanding of how to deal with the disease. Thus, comprehensive nursing significantly improves SDS and SAS scores [23, 24]. Blood pressure levels of patients were also measured. After nursing intervention, blood pressure levels of the two groups decreased significantly. Improvements in group B were significantly better than those in group A. This suggests that comprehensive nursing intervention can effectively improve blood pressure. Elevation of blood pressure is a typical symptom of PIH patients. By improving blood pressure conditions, patient conditions can be effectively controlled. Employing comprehensive nursing, nursing staffs can guide patients to plan their diet and medicine intake. This will help them to establish a scientific diet plan, controlling body weight. Additionally, nursing staffs supervise patients to take medicine timely, ensuring that blood pressure levels can be improved significantly [25].

The current study analyzed hospitalization times, medical expenses, nursing satisfaction, and total incidence of complications. Results suggest that comprehensive nursing intervention can reduce hospitalization times, medical expenses, and incidence rates of complications. Nursing satisfaction levels of group B were significantly higher than those of group A. The main reason is that incidence rates of complications are reduced after comprehensive nursing. Thus, times and costs of follow-up treatment are also reduced. Previous studies [26] have shown that active diet, behavior, and emotion control, along with appropriate medication, can effectively control blood pressure levels and reduce complications. According to present research, intervention improved patient blood pressure conditions, anxiety,

Table 7. Incidence of complications in the two groups of patients [n (%)]

Group	Postpartum hemorrhage	Eclampsia postpartum	Premature birth	Acute left heart failure	Amount to
A group (n = 84)	12 (14.29)	6 (7.14)	12 (14.29)	2 (2.38)	32 (38.10)
B group (n = 84)	3 (3.57)	3 (3.57)	5 (5.95)	0 (0.00)	11 (13.10)
Ki square	5.929	0.730	3.207	2.024	13.784
P	0.015	0.393	0.073	0.155	< 0.001

Table 8. Nursing satisfaction of the two groups of patients [n (%)]

Group	Very satisfied	Satisfied	Same as	χ^2	P
A group (n = 84)	33 (39.29)	35 (41.67)	16 (19.04)	8.403	0.020
B group (n = 84)	42 (50.00)	38 (45.24)	4 (4.76)		

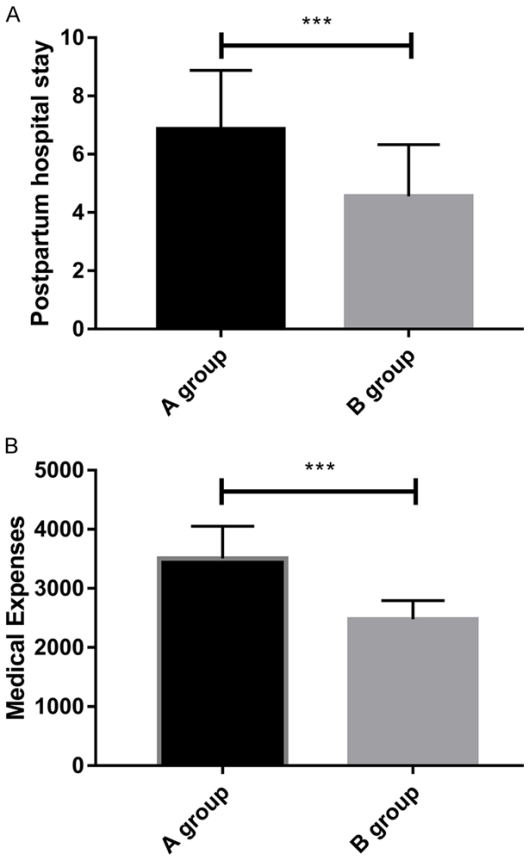

Figure 1. Hospitalization times and medical expenses of the two groups. A. Hospitalization time of group A was significantly longer than that of group B. B. Medical expenses of group A were significantly higher than that of group B. *Indicates differences were statistically significant (***P < 0.001).

depression, and complications. Results showed that comprehensive nursing significantly improved PIH patient conditions, including anxiety and depression levels. However, the current study still had some limitations. First, this study did not perform measurements concerning primary and secondary outcomes. Data accuracy should be strengthened in future studies. An indicator associated with well-being of individuals, quality of life levels were not measured. Regarding observed complications, there may have been other contribution factors that should have been excluded.

In conclusion, comprehensive nursing intervention effectively improves blood pressure conditions, as well as anxiety and depression levels, of PIH patients. This nursing method can reduce postpartum hospitalization times, medical expenses, and complications, as well as improve nursing satisfaction. Therefore, comprehensive nursing is suitable for clinical promotion.

Disclosure of conflict of interest

None.

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