

Prevention of Gestational Hypertension Complicated with Heart Failure

Hongjie Li†, Yuanyuan Li†, Peng Sun*, Mengdie Xie*, Huiping Tian, Jin Song, Xinrong Zhang, Ling Yin, Kai Wang, Ning Zhang, Danhua Xu

Affiliated Hospital of Hebei University, Baoding 071000, Hebei Province, China

†These authors contributed equally to this work and share first authorship.

*Corresponding author: Peng Sun, sunpeng5696@outlook.com; Mengdie Xie, 31351521lhj@sina.com

Copyright: © 2025 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: *Objective:* To explore effective preventive measures for gestational hypertension complicated with heart failure. *Method:* 23 patients with gestational hypertension complicated with heart failure who underwent prenatal examination and delivery in our hospital from January 2022 to January 2023 were selected. Provide routine prenatal care and treatment for these patients, and implement comprehensive prevention and intervention measures on this basis. Compare the incidence of heart failure, maternal and infant outcomes, and related clinical indicators between two groups of patients. *Result:* All 23 patients were successfully rescued. *Conclusion:* Implementing comprehensive prevention and intervention measures for patients with gestational hypertension can effectively reduce the incidence of heart failure, improve maternal and infant outcomes, and has important clinical application value.

Keywords: Pregnancy period; Hypertension disease; Heart failure; Prevention

Online publication: March 10, 2025

1. Introduction

Gestational hypertension is a pregnancy specific disease that poses a significant threat to the health of both mother and baby. The progression of its condition can lead to impaired cardiac function, concurrent heart failure, and increased maternal and neonatal mortality rates^[1]. Therefore, actively exploring effective preventive measures is of great significance for improving the prognosis of patients with gestational hypertension. By comparing the preventive effects of different prevention strategies on gestational hypertension complicated with heart failure, this study provides reference for clinical practice. The current research report is as follows.

2. Data and method

2.1. Research object

23 patients were selected, in which they were diagnosed with gestational hypertension during prenatal examination in the hospital from January 2022 to January 2023, aged 22 to 41 years old with an average of 28.1 years old. There were 17 primiparous women, 6 multiparous women, 2 cases with gestational weeks < 32 weeks, 7 cases with gestational weeks 32 to 36 weeks, and 14 cases with gestational weeks \geq 37 weeks.

Inclusion criteria include the following: Meet the diagnostic criteria for gestational hypertension; Singleton pregnancy; Patients and their families sign informed consent forms. Exclusion criteria include: Combination of severe primary diseases such as heart, liver, kidney, etc; Mental disorders cannot cooperate with researchers.

2.2. Method

On the one hand, regular prenatal care should be provided, including regular prenatal check-ups, blood pressure monitoring, dietary guidance (low salt, low-fat diet), and appropriate rest. According to the conventional treatment plan for gestational hypertension, when the blood pressure rises to a certain degree, antihypertensive drugs such as labetalol and nifedipine should be given, and the condition should be closely monitored for changes^[2]. On the other hand, the implementation of comprehensive prevention and intervention measures include:

(1) Health education

Professional medical staff provide health education on gestational hypertension to patients and their families, including the causes, symptoms, hazards, and prevention methods of the disease, to enhance patients' self-management awareness and abilities. They also distribute health education manuals, regularly organize health lectures, and answer patients' questions.

(2) Psychological intervention

It is necessary to pay attention to the psychological state of patients. Due to concerns about the disease and fetal health, patients often experience varying degrees of anxiety and depression. Psychological counseling, relaxation training and other methods help patients alleviate negative emotions and maintain a good mentality.

(3) Weight management

Develop an individualized weight gain plan based on the patient's pre-pregnancy body mass index (BMI), guide the patient on a reasonable diet, control calorie intake, and avoid rapid weight gain. Appropriate exercise should be carried out, such as walking, yoga for pregnant women, etc., but it should be done under the guidance of a doctor to avoid overexertion.

(4) Drug prevention

For patients with high-risk factors such as a history of hypertension before pregnancy, multiple pregnancies, obesity, etc., low-dose aspirin anticoagulation therapy should be given in early pregnancy to prevent placental vascular microthrombus formation, improve placental blood circulation, and reduce the risk of elevated blood pressure. Meanwhile, closely monitor coagulation function.

(5) Regular monitoring

Increase the frequency of prenatal check-ups, in addition to routine blood pressure and urine protein monitoring, and regularly conduct cardiac ultrasound examinations to evaluate cardiac structure and function. Starting from 28 weeks of pregnancy, a weekly cardiac function assessment should be conducted, including measurement of cardiac output, cardiac index, left ventricular ejection fraction, and

other indicators. Early detection and timely treatment of cardiac dysfunction should be carried out.

2.3. Treatment principles

The treatment of gestational hypertension complicated with heart failure should follow the following principles to ensure maternal and infant safety, effectively control the condition and prevent the occurrence of complications^[3].

(1) Quickly control heart failure to ensure maternal and infant safety

The primary task is to quickly alleviate symptoms of heart failure, reduce cardiac load through emergency treatment, improve cardiac function, and ensure the safety of mother and baby's lives.

(2) Comprehensive treatment to stabilize the condition

While controlling the symptoms of heart failure, comprehensive treatment of gestational hypertension, including lowering blood pressure, relieving spasms, etc., can stabilize the condition and prevent further deterioration.

(3) Terminate the pregnancy on time to avoid worsening of the condition

After controlling the symptoms of heart failure, terminate the pregnancy on time according to the condition and fetal condition to avoid worsening of the condition and greater threat to the mother and baby.

(4) Interdisciplinary collaboration to optimize treatment plans

Strengthen collaboration among multiple disciplines such as obstetrics, cardiovascular medicine, anesthesiology, pediatrics, etc., jointly develop and optimize treatment plans, and ensure the effectiveness and safety of treatment.

(5) Pay attention to follow-up monitoring and management to prevent complications

Continue to monitor the patient's vital signs and cardiac function after delivery, promptly detect and treat possible complications, and provide necessary rehabilitation guidance and psychological support^[4].

3. Results

3.1. Maternal and child health status

Out of 23 pregnant women, 1 died, accounting for 4.3% of cases of gestational hypertension complicated with heart failure and 33.3% of cases of gestational hypertension complicated with maternal deaths during the same period. There was also 1 case of cerebrovascular accident and 1 case of circulatory failure.

3.2. Perinatal situation

Among the 27 cases of perinatal infants, 11 cases were premature, accounting for 40.7%; 4 cases of intrauterine growth retardation, accounting for 14.8%; 6 cases of fetal distress, accounting for 22.2%; 5 cases of neonatal asphyxia (Apgar score ≤ 7), accounting for 18.5%; 3 cases of perinatal deaths (including 1 stillbirth), accounting for 11.1%.

4. Discussions

The pathogenesis of gestational hypertension complicated with heart failure is complex, mainly related to increased peripheral resistance caused by systemic small artery spasm, increased cardiac afterload, and myocardial damage caused by placental ischemia and hypoxia releasing various vasoactive substances. Therefore, in the actual

prevention process, it is necessary to implement comprehensive prevention and intervention measures for patients with gestational hypertension, including health education, psychological intervention, weight management, medication prevention, and regular monitoring, to effectively reduce the incidence of heart failure.

4.1. Role of health education and psychological intervention

Through systematic health education, patients can have a deeper understanding of the occurrence, development, and treatment process of diseases, thereby enhancing their self-management ability and better cooperating with treatment and nursing, including understanding the early symptoms of diseases, daily dietary precautions, the importance of reasonable exercise, and the necessity of taking medication on time. For example, medical staff can regularly hold health lectures, distribute promotional brochures, and use new media platforms such as WeChat and apps to provide health information, allowing patients to access relevant information anytime and anywhere. Patients with gestational hypertension often experience significant psychological pressure, worrying about the impact of the disease on the fetus, the effectiveness of treatment, and their health status. These negative emotions may lead to further elevation of blood pressure, increase the burden on the heart, and thus exacerbate the risk of heart failure^[5]. Therefore, psychological intervention has become an important part of preventing heart failure. Psychological intervention measures can include one-on-one counseling, relaxation training, and teaching emotional management skills to help patients learn how to effectively cope with negative emotions and maintain a calm mindset. The practice of psychological intervention in this study showed that through regular psychological counseling and emotional management training, patients' negative emotions were effectively alleviated, and blood pressure fluctuations were correspondingly reduced, thereby reducing the risk of heart failure to a certain extent.

4.2. Weight management and exercise

Weight management and exercise are important means to prevent gestational hypertension complicated with heart failure. Rapid weight gain not only increases the burden on pregnant women's hearts but may also lead to metabolic problems such as insulin resistance and dyslipidemia, further increasing the risk of heart failure. Therefore, reasonable weight management is crucial. In this study, an individualized weight management strategy was adopted, including regular monitoring of weight changes, developing personalized dietary plans, and controlling total calorie intake, which effectively controlled the patient's weight gain and reduced the risk of heart failure caused by rapid weight gain. Meanwhile, appropriate exercise is one of the important measures to prevent heart failure. Exercise can promote blood circulation, improve endothelial function, enhance myocardial contractility, and effectively prevent the occurrence of heart failure. In this study, patients underwent moderate aerobic exercise under the guidance of a doctor, such as walking and yoga for pregnant women. These exercises not only enhance the cardiovascular function of pregnant women but also improve their psychological state, helping them alleviate anxiety and stress.

4.3. Drug prevention

In the prevention of gestational hypertension, drug prevention plays a crucial role, especially the use of low-dose aspirin. Aspirin, as an antiplatelet aggregation drug, can effectively improve the blood circulation of the placenta by inhibiting platelet activity and reducing thrombus formation. This mechanism of action is of great significance for reducing the magnitude of blood pressure elevation, preventing the progression of gestational hypertension to more severe stages, and reducing the risk of heart failure. In this study, low-dose aspirin was administered as

a preventive treatment in early pregnancy for pregnant women with high-risk factors. By closely monitoring the patient's coagulation function, ensure the safety of drug use and avoid adverse reactions such as bleeding. The practice has shown that this drug prevention strategy reduces the magnitude of blood pressure elevation in patients, effectively controls the progression of gestational hypertension, and thus reduces the incidence of heart failure. It is worth noting that although low-dose aspirin has shown some efficacy in preventing gestational hypertension, its use still needs to be strictly controlled according to indications to avoid blind abuse. At the same time, regular monitoring of the patient's coagulation function should be carried out during the treatment process, and medication dosage should be adjusted or discontinued promptly to ensure the safety and effectiveness of the treatment.

4.4. Importance of regular monitoring

Due to the possibility of changes in cardiac structure and function caused by gestational hypertension, which increases the risk of heart failure, regular monitoring of cardiac function can detect abnormalities in cardiac function early, provide a key basis for clinical decision-making, adjust treatment plans on time, and effectively prevent the occurrence of heart failure. Cardiac ultrasound examination, as a non-invasive and accurate diagnostic tool, is an important tool for evaluating the structure and function of the heart. In this study, a strategy was adopted to increase the frequency of cardiac function monitoring, with weekly cardiac function assessments starting from 28 weeks of pregnancy. The evaluation includes measuring indicators such as cardiac output, cardiac index, and left ventricular ejection fraction, which can comprehensively reflect the working status and pumping function of the heart. Through this series of monitoring, multiple potential heart problems were identified, such as heart enlargement and decreased heart function, and timely treatment interventions were given, such as adjusting the dosage of antihypertensive drugs and strengthening diuretic therapy, effectively avoiding the occurrence of heart failure^[6]. Practice has shown that regular monitoring of cardiac function can not only detect heart problems early but also provide the scientific basis for adjusting treatment plans, ensuring the accuracy and effectiveness of treatment. At the same time, regular monitoring can enhance patients' self-management awareness, improve treatment compliance, and further enhance the effectiveness of preventing heart failure. Therefore, in the management of gestational hypertension, the importance of regular monitoring of cardiac function should be highly valued as one of the key measures to prevent heart failure.

5. Conclusion

In summary, gestational hypertension complicated with heart failure poses a threat to the safety of mother and infant life. Taking comprehensive preventive interventions based on routine prenatal care can reduce the incidence of heart failure. Clinical workers should actively promote the application of comprehensive prevention strategies, improve the level of prevention and treatment of gestational hypertension, and safeguard maternal and infant health. In the future, further large-scale and multi-center research is needed to explore more optimized prevention plans and continuously improve the prevention system for gestational hypertension complicated with heart failure.

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Zhong H, Jin X, Jiang Y, et al., 2024, Study on the Correlation Between Placental Immune Cell Count and Perinatal Outcomes in Patients with Gestational Hypertension. *Advances in Modern Obstetrics and Gynecology*, 33(12): 900–904+909.
- [2] Liao H, Wang Y, Liang X, et al., 2024, Clinical Characteristics and Pregnancy Outcomes of Twin Pregnancy Complicated with Gestational Hypertension. *Guangdong Medical Journal*, 45(12): 1584–1588.
- [3] Guo Y, Feng S, Yang D, et al., 2024, Qualitative Study on the Discharge Preparation Needs of Pregnant Women with Gestational Hypertension. *Journal of Aerospace Medicine*, 35(11): 1402–1405.
- [4] Han F, Zhang X, 2024, Application Effect of Nursing Based on Stress System Theory in Patients with Gestational Hypertension During Delivery. *Chinese Minkang Medicine*, 36(22): 180–182.
- [5] Xia X, Wu Y, Ding K, et al., 2024, Summary of the Best Evidence on Dietary Plan for Patients with Gestational Hypertension. *Nursing Research*, 38(22): 4026–4031.
- [6] Pan F, 2024, The New Version of Hypertension Prevention and Treatment Guidelines Guide the Prevention and Treatment of Hypertension in Women and Children. *Maternal and Child Health Guide*, 3(19): 10–12.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.