

# Research Progress on Blood Pressure Management Strategies for Patients with Hypertensive Disorders in Pregnancy

Yaxin Du\*

The Second Affiliated Hospital of Dali University (The Third People's Hospital of Yunnan Province), Kunming 650011, Yunnan, China

\*Author to whom correspondence should be addressed.

**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:** This article summarizes blood pressure management strategies for patients with hypertensive disorders in pregnancy, including establishing a dynamic blood pressure monitoring system from a clinical perspective, strengthening education to improve patients' self-management abilities, applying portable home instruments to assist in monitoring and guiding medication from a technical perspective, and conducting community screening and graded management of hypertensive disorders in pregnancy from a social perspective. The results indicate that individual differences should be considered in clinical practice, and patient-centered individualized blood pressure management strategies should be established.

**Keywords:** Gestational hypertension; Blood pressure management; Dynamic blood pressure monitoring system; Self-management

**Online publication:** April 28, 2025

## 1. Introduction

Hypertensive disorders of pregnancy (HDP), also known as hypertensive complications during pregnancy, are common yet profound conditions during gestation. These disorders are primarily characterized by persistent hypertension in pregnant women, posing significant risks to both the mother and fetus <sup>[1]</sup>. Although the exact causes remain incompletely understood, it is generally believed that they may arise from interactions between genetic factors, lifestyle choices, and certain environmental factors <sup>[2]</sup>. Over time, global medical research has gradually uncovered a growing trend in the incidence of hypertensive disorders during pregnancy, particularly among older mothers and those with previous childbirth experience, where the condition becomes more prevalent <sup>[3]</sup>. More concerningly, hypertensive disorders during pregnancy not only threaten the mother's health but may also lead to issues such as abnormal fetal development and premature birth. Therefore, controlling blood pressure

during pregnancy is crucial as it directly relates to the well-being of both the mother and child. To address this challenge, the American College of Obstetricians and Gynecologists (ACOG) released an important guideline in 2018, aimed at providing obstetricians and gynecologists with direction to improve the management of hypertensive disorders during pregnancy. The guideline clearly states the critical role of preventive measures, early diagnosis and intervention strategies, as well as educational and support services, to ensure favorable pregnancy outcomes. These recommendations reflect the medical community's strong emphasis on improving the quality of hypertension management during pregnancy. To further enhance education and research in this area, experts continuously explore new methods and technologies to better monitor pregnant women's blood pressure levels and take necessary intervention measures on time<sup>[4]</sup>. Through this comprehensive treatment approach, the negative impacts of hypertensive disorders during pregnancy can be significantly reduced, thereby protecting the health and safety of both mother and child. Although the exact causes of hypertensive disorders during pregnancy remain to be further investigated, we are steadily moving towards improving this situation through scientific management and comprehensive health education.

## **2. Managing patients with hypertensive disorders of pregnancy from a clinical perspective**

### **2.1. Establishing a dynamic monitoring system to understand patients' true blood pressure status**

#### **2.1.1. Advantages of dynamic blood pressure monitoring**

Currently, clinical methods for measuring blood pressure primarily include office blood pressure monitoring and dynamic blood pressure monitoring. Office blood pressure monitoring is mainly applied to patients with gestational hypertension, while dynamic blood pressure monitoring can be used for the diagnosis and monitoring of other diseases such as hypertension and diabetes.

However, due to various reasons, patients with hypertensive disorders during pregnancy may refuse or be unable to complete office blood pressure monitoring, resulting in inaccurate blood pressure data. Therefore, it is necessary to obtain reliable information through dynamic blood pressure monitoring to better guide treatment decisions. According to a study by Zhang et al.<sup>[5]</sup>, compared to office blood pressure, using a dynamic blood pressure monitor for continuous 24-hour blood pressure monitoring resulted in a significant reduction of 6.3 mm Hg (0.28–11.7%) in the mean systolic blood pressure (mSBP) of patients with hypertensive disorders during pregnancy, while the mean diastolic blood pressure (mDBP) showed no significant change. A study by Zhou et al.<sup>[6]</sup> demonstrated that dynamic blood pressure monitoring in late pregnancy can effectively avoid the adverse effects of hypotension on the fetus.

#### **2.1.2. Limitations of dynamic blood pressure monitoring**

Despite its many advantages, dynamic blood pressure monitoring also has certain limitations<sup>[7]</sup>.

- (1) It can only reflect the blood pressure situation at the time of measurement and cannot provide information on blood pressure trends over a period of time.
- (2) Patients may experience discomfort due to factors such as electrode patches pressing on the skin or improper wearing methods, affecting patient compliance.
- (3) Even with qualified monitoring equipment, its results may not meet expected ideals due to equipment performance limitations.

These factors may lead to discrepancies between actual and target blood pressure, thereby increasing hypertension risk.

## **2.2. Strengthen education during pregnancy to improve patients' self-management ability and compliance**

Currently, most nursing staff in primary hospitals in China lack standardized clinical training in the management of hypertensive disorders of pregnancy. Therefore, it is particularly important to strengthen patient education.

- (1) According to Zhu et al. <sup>[8]</sup>, efforts should be made from three aspects: doctors, nurses, and family members to improve healthcare workers' knowledge and understanding of HDP. Lectures, education, discussions, and other methods should be used to deepen the impression of relevant knowledge among patients and their family members, helping them understand the characteristics of the disease and how to respond.
- (2) Li et al. <sup>[9]</sup> showed that healthcare workers should actively explain to patients and their family members the pathogenesis, early symptoms, diagnostic criteria, treatment options, drug selection, pregnancy risk assessment, and preventive measures of hypertension during pregnancy. This allows patients to have a full understanding and psychological preparation for the disease, thereby reducing fear and anxiety, enhancing self-confidence and self-protection awareness, and increasing treatment compliance.
- (3) Given that many patients with hypertensive disorders during pregnancy often have comorbidities such as diabetes, nephrotic syndrome, hypothyroidism, and liver or kidney dysfunction, Gang et al. <sup>[10]</sup> revealed that healthcare workers should inform patients of various possible complications during pregnancy, including placental abruption, fetal growth restriction, preterm birth, and low birth weight infants. They should also introduce treatment methods and the prognosis of these complications to eliminate patients' concerns and worries, allowing them to receive treatment with peace of mind.
- (4) Fan et al. <sup>[11]</sup> proposed personalized education content for different populations, such as providing prenatal guidance to pregnant women in early, mid, and late stages of pregnancy, or integrating education throughout the entire pregnancy. This not only helps improve patients' self-management abilities but also facilitates comprehensive management.

## **3. Management of patients with hypertensive disorders of pregnancy from a technical perspective**

### **3.1. Advantages and disadvantages of using home blood pressure monitors**

Since patients may be unable or unwilling to undergo blood pressure monitoring in hospitals, the development of portable home blood pressure monitors (such as wrist and finger clip monitors, electronic blood pressure monitors, etc.) is crucial for managing blood pressure in pregnant women. These devices are easy to operate and use, allowing women to monitor their blood pressure at home, which is beneficial for developing good habits, self-management awareness, timely adjustment of antihypertensive medication dosages, and improving compliance. However, home blood pressure monitors also have some disadvantages <sup>[12]</sup>: (1) They may produce inaccurate measurements without medical supervision; (2) They are not suitable for emergency patients; (3) Due to the lack of standardized data, it is difficult to scientifically analyze relevant factors and determine the best treatment plan.

### **3.2. Blood pressure measurement methods at home and abroad**

Currently, various home blood pressure monitors with certain measurement accuracy and stability have been

developed both domestically and internationally. According to the latest guidelines for the management of hypertensive disorders during pregnancy, it is recommended that all pregnant women undergo regular monitoring using office blood pressure monitoring methods. For pregnant women with hypertension, daily blood pressure monitoring at home can help better control blood pressure levels. It is important to note that to ensure the accuracy of measurements, a relatively fixed time point should be selected for measurement. Additionally, it is advisable to have a family member assist in the measurement to reduce errors caused by human factors. Different measurement methods can be chosen based on the stage of pregnancy, such as the sitting position method recommended for early pregnancy and the supine position method for mid to late pregnancy <sup>[13]</sup>. It is worth mentioning that continuous measurement of blood pressure in the same area for a long time should be avoided to prevent excessive vasoconstriction reaction, which may lead to lower blood pressure values.

### **3.3. Using home portable devices to assist blood pressure monitoring and medication guidance**

When measuring blood pressure, it is crucial to ensure that the selected equipment has undergone strict quality control. Upper arm electronic blood pressure monitors are generally recommended due to their high accuracy. However, before purchasing, it should be ensured that the device has been certified by international authoritative organizations such as the European Society of Hypertension (ESH), the Association for the Advancement of Medical Instrumentation (AAMI), or the British Hypertension Society (BHS). Additionally, selecting the appropriate cuff size based on individual upper arm circumference is important, as oversized or undersized cuffs can affect measurement results.

The correct steps for measuring blood pressure include <sup>[14]</sup>: sitting quietly for at least 5 minutes before measurement to avoid interference from movement and anxiety; maintaining an upright sitting position with feet flat on the ground, arms naturally hanging down, and aligned with the heart; ensuring that the cuff is tightly fitted to the skin, not too loose or tight, to avoid affecting measurement accuracy. Follow the instructions provided in the blood pressure monitor manual, take 2 to 3 consecutive measurements with a 1-minute interval, and calculate the average value as the final blood pressure reading.

Recording blood pressure data plays a significant role in monitoring disease progression and adjusting treatment plans. After each measurement, detailed records should be kept, including the date, specific time, blood pressure readings, and heart rate information. Regularly reviewing these data can help identify abnormal fluctuations. This information will assist doctors in better understanding your health status and adjusting medication regimens promptly <sup>[15]</sup>. To ensure regular medication adherence, patients should strictly follow the prescriptions provided by doctors and avoid unauthorized adjustments to dosages or stopping medications. Doctors will evaluate the need for medication adjustments based on blood pressure data and provide timely feedback to patients, setting reminders to ensure that patients take their medications as scheduled, thus effectively managing their blood pressure conditions <sup>[16]</sup>.

## **4. Management of patients with hypertensive disorders of pregnancy from a social perspective**

### **4.1. Conducting community screening and implementing tiered management**

In China, due to the lack of professional management personnel, many pregnant women with hypertensive disorders during pregnancy are not timely identified. Therefore, it is essential to carry out community screening

targeted at patients with hypertensive disorders during pregnancy. Wang <sup>[17]</sup> screened 1718 pregnant women who established mother-child health manuals and found that only 12% of them received adequate blood pressure monitoring and health education. Moreover, 45.8% of pregnant women had no understanding of hypertension during pregnancy, indicating that China has not established a comprehensive community screening system for hypertensive disorders during pregnancy.

In the United States, some communities have established standardized tiered management systems for hypertensive disorders during pregnancy. For example, the “Healthy Pregnancy” program has reduced the incidence of hypertensive disorders during pregnancy through multiple free blood pressure checks and lifestyle guidance for pregnant women <sup>[18]</sup>. These research results suggest that strengthening social advocacy, raising public awareness of the dangers of hypertensive disorders during pregnancy, and incorporating hypertension classification management into national health policies can effectively prevent the occurrence of hypertensive disorders during pregnancy. China should learn from international experience, consider its national conditions, and establish a sustainable community screening and tiered management model for hypertensive disorders during pregnancy that is tailored to its specific context.

## **4.2. Develop individualized treatment plans and take comprehensive measures to control blood pressure**

For patients whose blood pressure is not at the target level, oral or intravenous antihypertensive medications can be used for control <sup>[19]</sup>. Additionally, attention should be paid to other risk factors such as obesity, hyperglycemia, and diabetes. In the early stages of pregnancy, if patients have comorbidities such as diabetes, hypertension, and hyperlipidemia, these conditions should be treated simultaneously to achieve better blood pressure control <sup>[20]</sup>. In the later stages of pregnancy, apart from taking antihypertensive medications, appropriate drugs should be administered for antiplatelet aggregation therapy <sup>[21]</sup>.

However, due to the complex physiological changes during pregnancy, there is currently no standard treatment plan that is suitable for all patients with hypertensive disorders during pregnancy. Therefore, when developing individualized medication plans, doctors must comprehensively evaluate patients, understand the severity and tolerance of their conditions, and consider their unique characteristics. After weighing the pros and cons, doctors should select appropriate medication plans. For instance, Wang’s results showed that pregnant women with a bleeding tendency can be preferentially treated with drugs such as beta-blockers and calcium channel blockers <sup>[22]</sup>. For pregnant women at risk of severe preeclampsia, medications such as diuretics, angiotensin-converting enzyme inhibitors (ACEI), and angiotensin II receptor antagonists (ARB) can be administered <sup>[23]</sup>. For older pregnant women, drugs such as alpha-blockers or cerebrovascular dilators should be selected based on their conditions, thereby effectively controlling blood pressure levels and reducing the occurrence of maternal and fetal complications <sup>[24]</sup>.

## **5. Conclusion**

Hypertensive disorders during pregnancy are a global public health issue, and there is still a lack of effective prevention and treatment methods. This article summarizes recent research progress in blood pressure management for patients with hypertensive disorders during pregnancy by domestic and foreign scholars. More high-quality research is needed in the future to clarify whether hypertension increases the risk of preeclampsia, gestational

diabetes, and fetal growth restriction, as well as how to improve the quality of life for pregnant women with hypertension. Furthermore, individual differences should be considered in clinical practice, and patient-centered individualized blood pressure management strategies should be established. Simultaneously, blood pressure monitoring and education for patients and their families should be strengthened, and a community-based tiered management model should be implemented. The roles of home visits and telephone follow-ups should be fully utilized to comprehensively protect the health of mothers and babies, shifting from mere disease management to integrated health management, thereby improving adverse outcomes for mothers and babies in China.

## Disclosure statement

The author declares no conflict of interest.

## References

- [1] Dinala G, Li M, Dai J, et al., 2024, Research Progress of Traditional Chinese and Western Medicine for Hypertensive Disorder Complicating Pregnancy. *World Chinese Medicine*, 19(21): 3374–3377.
- [2] Pan X, 2021, What Are the Causes of Hypertensive Disorder Complicating Pregnancy? Why Do We Get Hypertensive Disorder Complicating Pregnancy. *Healthcare Digest*, 22(19): 61.
- [3] Liu Y, 2021, How to Prevent Hypertensive Disorder Complicating Pregnancy for Pregnant Women. *Grand Health*, 2021(12): 82, 83.
- [4] He H, 2020, Research Progress on Pregnancy Nursing of Gestational Diabetes Mellitus. *Diet and Healthcare*, 2020(41): 215.
- [5] Zhang L, Xu X, Hu P, et al., 2020, Blood Pressure and Blood Pressure Variability in Late Pregnancy With Subclinical Hypothyroidism. *Chinese Journal of Family Planning*, 28(4): 511–514.
- [6] Zhou Y, Ni R, 2020, Study on the Clinical Predictive Value of Median Estimation of Blood Pressure Cycle and Monitoring of Hypertension-Related Index in Different Gestational Weeks. *Chinese Journal for Clinicians*, 48(2): 223–226.
- [7] Dai X, 2019, Analysis of the Diagnostic Value of Ambulatory Blood Pressure Monitor in Occult Hypertension. *Medicine Frontier*, 9(23): 70.
- [8] Zhu J, Jin X, Li Y, 2024, The Influence of Prenatal Health Education and Psychological Nursing on the Outcome of Maternal Delivery. *Journal of Shanxi Vocational College of Health*, 34(5): 136–138.
- [9] Li J, Jin Y, Gao H, et al., 2024, The Influence of Diversified Propaganda and Education on the Psychological Self-Management of Primiparas During Pregnancy. *Smart Health*, 10(16): 130–133.
- [10] Gang J, Kong H, Chen Y, 2024, Analysis of Clinical Characteristics of Fetal Death in Late Pregnancy and Discussion on Management Measures. *Practical Gynecological Endocrinology Electronic Journal*, 11(16): 12–16.
- [11] Fan J, Li J, Fang S, 2024, The Influence of Group Health Education Mode During Pregnancy on Health Behaviors, Delivery Methods, and Mother-Infant Outcomes of Primiparas During Pregnancy. *Healthcare Medicine Research and Practice*, 21(1): 107–111.
- [12] Zhu Z, Yang J, Sheng Q, 2020, Ergonomic Design of Home Electronic Blood Pressure Monitor for the Elderly. *Ergonomics*, 26(2): 31–35, 41.
- [13] Kang C, 2020, How to Choose and Use a Household Electronic Blood Pressure Monitor? *Health World*, 2020(2): 80–81.

- [14] Li Y, 2016, Things About Measuring Blood Pressure. *Health Expo*, 2016(11): 26.
- [15] Wang L, 2024, Preliminary Exploration of the Application Value of Noninvasive Hemodynamic Monitoring in Hypertensive Disorder Complicating Pregnancy, thesis, Shandong University.
- [16] Han M, Chen Y, Tian X, 2023, Construction of Obstetric System Based on Personal Digital Assistant and Its Application in Patients With Hypertensive Disorder Complicating Pregnancy. *China Medical Equipment*, 38(5): 130–135.
- [17] Wang W, 2022, Analysis of the Influence of Community Maternal Risk Screening on Pregnancy Outcome. *Chinese and Foreign Women’s Health Research*, 2022(7): 62–64.
- [18] Neuburg B, Gallagher M, Liegl M, et al., 2024, Inpatient Versus Outpatient Management of Gestational Hypertension or Preeclampsia Without Severe Features. *Pregnancy Hypertension*, 39101173.
- [19] Li Y, Liu M, Wang Z, 2023, Research Progress on Drugs for the Intervention and Treatment of Hypercoagulability in Hypertensive Disorder Complicating Pregnancy. *Clinical Research on Traditional Chinese Medicine*, 15(3): 120–124.
- [20] Deng Y, Qi X, 2023, Analysis of Influencing Factors and Treatment of Hypertensive Disorder Complicating Pregnancy. *Health Must-Read*, 2023(1): 31–32.
- [21] Xiang P, 2019, Treatment of Hypertensive Disorder Complicating Pregnancy. *Medical Aesthetics and Cosmetology*, 28(18): 184–185.
- [22] Wang J, 2022, Observation on the Therapeutic Effect of Misoprostol on Hypertensive Disorder Complicating Pregnancy With Postpartum Hemorrhage. *Great Doctor*, 7(12): 136–138.
- [23] Zhao Y, 2020, Clinical Evaluation of Combined Regimen for the Prevention of Preeclampsia in Hypertensive Disorder Complicating Pregnancy. *China Health Standard Management*, 11(3): 80–81.
- [24] Pang G, 2015, Diagnosis and Treatment of Hypertensive Disorder Complicating Pregnancy. *Mother and Baby World*, 2015(12): 41–42.

**Publisher’s note**

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