Management of Blood Pressure in Pregnancy: New Perspectives from the CHAP Trial

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Introduction

- In the United States chronic hypertension is defined as elevated blood pressure occurring pre-pregnancy or that is recognized prior to 20 weeks gestation and affects up to 10% of pregnancies.[1,2 3]
- Chronic hypertension is associated with increased risk of adverse pregnancy outcomes and its prevalence has nearly doubled in the United States from 2007 to 2019.[1,3,4,5]
- Improved treatment of hypertension in pregnancy has been hypothesized to result in improved outcomes, but the recommended goal for blood pressure during pregnancy differs among international societies.[4]
- There is universal agreement that anti-hypertensive agents should be administered for persons experiencing severe hypertension (>160/110 mm Hg), however opinions differ regarding the role of antihypertensive medication in those with mild chronic hypertension (<160/110 mm Hg).[4]

Treatment for Mild Chronic Hypertension during Pregnancy (CHAP) Trial

- Published in *The New England Journal of Medicine* online in April 2022
- Multicentered, pragmatic, open-label randomized control trial conducted across 70 recruiting sites in the US.
- Hypothesis: The treatment for mild chronic hypertension early in pregnancy would lower the incidence of adverse maternal and perinatal outcomes related to hypertensive disease. [6]

Treatment Groups

Active Treatment Group: antihypertensive therapy with goal of systolic BP <140 mm Hg and diastolic BP <90

Standard Treatment Group: antihypertensive therapy withheld or stopped at randomization and initiated if systolic blood pressure increased to >160 mm Hg or if diastolic BP increased to > 105 mm Hg).

Primary Outcomes

Preeclampsia with severe features occurring up to 2 weeks post-partum, placental abruption, fetal or neonatal death, or medically indicated preterm birth before 35 weeks gestation

Primary Safety Outcome

Poor fetal growth, defined as infant birth weight of less than the 10th percentile for gestational age

Secondary Outcomes

Serious complications (stroke, encephalopathy, heart failure, pulmonary edema, myocardial infarction or angina, intensive care unit (ICU) admission or intubation, and renal failure) or maternal death

Results

For the first time that the recommended guidelines by other international societies for treatment of HTN when applied to the treatment of pregnant women and may result in improved outcome without an increase in fetal growth restriction.[5,8]

Long term Effects of Hypertensive Disease In pregnancy

- The risk of hypertensive disorders of pregnancy is not only associated with poor pregnancy outcomes, but also has long-term impacts on maternal and child health.
- Women affected by HDP have been shown to have an increase in early mortality with the strongest relations with cardiovascular disease related mortality.[9]

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International Guidelines for Hypertensive Treatment

Institution	Blood Pressure Parameters	Additional Management/Notes
American College of Obstetricians and Gynecologists	• Antihypertensives should be initiated to obtain a goal of <160/110 • 140/90 is the threshold and goal for titration of antihypertensive therapy in CHTN in pregnancy	• Stress that optimal BP goal in pregnancy is uncertain • BP level at which FGR may be at risk is not established • Recommends Low dose Aspirin for preeclampsia risk reduction
American College of Cardiology/American Heart Association	Diagnoses HTN as >130/80	State that it is "beyond the scope of the present guideline to address the management of hypertension during pregnancy in detail"
Society of Obstetric Medicine of Australia and New Zealand	Blood pressures >170/110 require urgent treatment	
Brazilian Guideline of Arterial Hypertension	Initiated antihypertensive therapy >150/100	
The Institute of Obstetricians and Gynaecologists, Royal College of Physicians of Ireland	Antihypertensive treatment with goals: • SBP <150 and DBP 80-90 in patients without comorbidities • SBP <140 and DBP <80-99 for pts with risk factors	
The International Society for the Study of Hypertension in Pregnancy (ISSHP)	Thresholds for initiation of therapy to >140/90 or >135/85 mm Hg measured with a home device	Treatment goal of 110-140/85 mm Hg
Queensland Maternity and Neonatal Clinic	Treating postpartum blood pressures to a goal of <140/90	
The European Society of Cardiology/European Society of Hypertension	initiation of antihypertensives for blood pressures persistently greater than 150/95 with a goal of <140/90 in pregnant patients	

Official Statements in Support of CHAP Trial

- American Heart Association Scientific Statement: recommend the initiation of antihypertensives for women with chronic hypertension starting at BP >140/90, citing evidence that this may prevent severe hypertension and preeclampsia, which is associated with poor long-term health effects, such as increased risk of stroke, early mortality and long-term cardiovascular disease.[8]
- Society for Maternal-Fetal Medicine Statement: recommend treatment with antihypertensive therapy for mild chronic hypertension in pregnancy to a goal blood pressure of <140/90 mm Hg. While the study results can be generalized due to the diverse study population, the results did not show significant difference in treatment groups in populations of newly diagnosed chronic hypertension or with a BMI >40.21.[11]

Conclusion

- As seen in the April 2022 CHAP trial, treating chronic hypertension at earlier stages (BP>140/90) was shown to lead to better maternal and fetal outcomes.
- Based on the results of the CHAP trial and other supporting evidence from recent studies, and with the further recommendation from SMFM and ACOG, we recommend initiating and titrating antihypertensive medications in patients with chronic hypertension at a lower BP threshold of 140/90.
- Additional studies are needed to determine the optimal treatment recommendations however for gestational hypertension and preeclampsia.

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