Chronic high blood pressure during pregnancy doubled between 2008 and 2021 in the US: Study

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The number of individuals in the U.S. who had chronic hypertension or chronic high blood pressure during pregnancy doubled between 2008

and 2021, while the prescribing and filling of antihypertensive medication during pregnancy remained low but stable at 60%, according to research published in *Hypertension*.

Chronic hypertension in pregnancy is defined as high blood pressure diagnosed before pregnancy or before 20 weeks of pregnancy. Recent research has suggested that medication treatment of mild or moderate high blood pressure during pregnancy reduces the risk of severe hypertension and preeclampsia.

Preeclampsia typically begins after 20 weeks of pregnancy, can cause liver or kidney damage, and may double a woman's chances for future heart failure and other cardiovascular complications.

In 2017, clinical guideline from the American Heart Association and the American College of Cardiology revised the thresholds to diagnose high blood pressure from 140/90 mm Hg to 130/80 mm Hg for stage 1, and from 160/110 mm Hg to 140/90 mm Hg for stage 2 hypertension.

The guideline recommends medication treatment for non-pregnant adults with stage 2 high blood pressure; for stage 1 high blood pressure in individuals with type 1 or type 2 diabetes, or kidney disease; and for stage 1 high blood pressure in individuals with established cardiovascular disease or without cardiovascular disease but with an estimated 10% or higher risk of developing atherosclerotic cardiovascular disease.

"We had hoped to see some impact from the 2017 guideline, which reduced the blood pressure threshold for treatment of hypertension. We were surprised to not find any meaningful changes from before and after the guideline," said lead study author Stephanie Leonard, Ph.D., an epidemiologist and assistant professor in maternal-fetal medicine and obstetrics at Stanford University's School of Medicine in Stanford, California.

"While the rate of hypertension in pregnancy has doubled, the use of medication for treatment remained stable at only 60%, which we believe is likely below what it should be if patients are treated according to clinical guidelines."

The researchers analyzed a database of private health insurance claims for 2007 to 2021 and found:

- The rate of high blood pressure diagnosis steadily increased from 1.8% to 3.7% among 1.9 million pregnancies between 2008 and 2021. Over the 14-year study period, this amounted to a doubling in the rate of high blood pressure in pregnancy.
- The frequency of high blood pressure during pregnancy continued to rise steadily, without a spike in new diagnoses after the 2017 ACC/AHA hypertension guideline, which lowered the threshold for stage 1 hypertension to blood pressure readings ≥130/80 mm Hg.
- A higher proportion of the individuals with high blood pressure were ages 35 or older, lived in the South (Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Virginia, West Virginia, Tennessee, Oklahoma, Texas or the District of Columbia, according to the Census Bureau) and had other chronic health conditions, such as obesity, type 1 or type 2 diabetes, or kidney disease.
- The use of medication for high blood pressure treatment during pregnancy remained low and relatively stable, ranging from 57% to 60% over the 14-year study period.
- The number of pregnant individuals with high blood pressure treated with the medications methyldopa or hydrochlorothiazide, decreased from 29% to 2% and from 11% to 5%, respectively, over the study period. The proportion of patients treated with antihypertensive medications labetalol or nifedipine increased

from 19% to 42% and from 9% to 17%, respectively. These are the currently recommended, first-line medications for chronic hypertension in pregnancy, Leonard said.

"This study highlights the growing burden of chronic hypertension and poor cardiovascular health pre-pregnancy as critical targets to improve maternal health. These data are consistent with prior studies highlighting the increasing prevalence of hypertension from data from the National Vital Statistics System, which covers all births in the U.S.," said Sadiya S. Khan, M.D., M.Sc., FAHA, chair of the writing group for the Association's 2023 scientific statement, "Optimizing Prepregnancy Cardiovascular Health to Improve Outcomes in Pregnant and Postpartum Individuals and Offspring."

Khan is the Magerstadt Professor of Cardiovascular Epidemiology and an associate professor of medicine and preventive medicine at the Northwestern University Feinberg School of Medicine and a preventive cardiologist at Northwestern Medicine, both in Chicago.

"Since nearly one in three individuals with chronic hypertension may face a pregnancy complication, the prevention and control of hypertension should be among the highest priorities for improving maternal health," Khan added.

Study design, background and details:

- The database used in the study includes private, or commercial, health insurance claims, as well as enrollment data from large employers and health plans across the U.S. that provide private health care coverage for employees, their spouses and dependents. The database has information for claims involving several million individuals annually in the United States.
- Researchers identified oral antihypertensive medications

dispensed by outpatient pharmacies using a previously established list of medications. Patient characteristics, including age, region of residence in the U.S. and birth year were noted.
- The study examined treatment rates and type of medication use among people with conditions including obesity, kidney disease, type 1 or type 2 diabetes, lupus, thyroid disorder, and pregnancies involving more than one fetus (twins, triplets, etc.).

The study had several limitations. First, the database only noted prescriptions that were filled, not if the prescription was taken as directed. The database also did not include blood pressure measurements, so chronic hypertension status was assessed by diagnosis codes; this meant the researchers could not analyze the severity of high blood pressure or assess blood pressure changes.

In addition, the findings may not be generalizable to people who have Medicaid for health insurance, people without insurance or people who live in other countries with health care systems different from the U.S.

More information: Chronic Hypertension During Pregnancy:Prevalence and Treatment in the United States, 2008–2021, *Hypertension* (2024). DOI: 10.1161/HYPERTENSIONAHA.124.22731

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