Impact of the New American Hypertension Guidelines on the Prevalence of Postpartum Hypertension

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Abstract

Cardiovascular disease (CVD) is the leading cause of death and disability among women, with more than half occurring in individuals with hypertension. New blood pressure criteria for the diagnosis of hypertension from the American College of Cardiology/American Heart Association recognize that there is no specific blood pressure threshold that is associated with vascular disease. We performed a secondary analysis of two published postpartum databases (the Pre-Eclampsia New Emerging Team [PE-NET] cohort and the Maternal Health Clinic [MHC] cohort) to determine the impact of the change in blood pressure criteria on the diagnosis of hypertension. The prevalence of hypertension in women with uncomplicated pregnancies (PE-NET control) was 22% compared with 56.4% in those who have had a pregnancy complicated by preeclampsia (PE, PE-NET patient) and 67.2% in those referred to the MHC due to a pregnancy complicated by any of the hypertensive disorders of pregnancy. It is well established that certain complications in pregnancy can reliably identify women with risk factors for future CVD. Thus, pregnancy and the postpartum afford a new opportunity for cardiovascular risk screening that could lead to lifestyle modification and therapeutic intervention. Applying the new guideline criteria at least doubles the prevalence of women with hypertension postpartum.

Keywords
- hypertension
- preeclampsia
- postpartum
- cardiovascular disease

Worldwide, hypertension (HTN) is the leading cause of death and disability-adjusted life years.[1] For example, in the U.S. National Health and Nutrition Examination Survey follow-up study, more than half of the deaths from coronary heart disease or stroke occurred in individuals with a history of HTN[2]; blood pressure is strongly and directly related to vascular mortality without any evidence of a threshold. As such, the American College of Cardiology/American Heart Association (ACC-AHA)[1] has changed the criteria for the diagnosis of HTN to $\geq$130/80 mm Hg from the previous long-standing criteria of $\geq$140/90 mm Hg; 19% of women age 20 to 44 years would be expected to meet the ACC-AHA guidelines for the diagnosis of HTN.[1]

Recognizing that many women at a risk of cardiovascular disease (CVD) are often asymptomatic, innovative or novel ways to screen for CVD risk factors is required; risk factors are often present for years prior to the development of CVD. The development of certain pregnancy complications (e.g., hypertensive disorders of pregnancy [HDP], gestational diabetes, idiopathic preterm birth, delivery of a growth restricted baby, or a placental abruption leading to delivery) can reliably identify women with underlying, often unrecognized, CVD

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risk factors within the first year postpartum.[3] Our objective was to apply the new ACC-AHA criteria for HTN to two existing postpartum databases to determine what proportion of women who had an uncomplicated pregnancy or a pregnancy complicated by a hypertensive disorder would now be classified as having HTN. The findings have implications for the future healthcare of women.

Methods

We performed a secondary analysis of the Pre-Eclampsia New Emerging Team (PE-NET) data for control ($n = 130$) and PE women ($n = 110$)[4] who were screened at 12 months postpartum and those women with an HDP who were seen in the Maternal Health Clinic (MHC) cohort ($n = 265$) at 6 months postpartum.[5] Blood pressure measurements were obtained according to the checklist for accurate measurement of blood pressure,[1] except that we used an average of five readings over 10 minutes on a single occasion; for the management of HTN, the blood pressure should be checked over more than one episode. The primary data were entered as collected by a research nurse and confirmed by the attending physician. Ethics information, recruitment, and inclusion and exclusion criteria for these two published studies have previously been reported. For the PE-NET cohort, only women who were seen at 1 year postpartum and who had a blood pressure measurement were included. For the MHC cohort, 268/526 women seen between November 2011 and January 2017 were referred because of an HDP (PE, HELLP syndrome, or gestational HTN). To age match with the ACC-AHA guidelines data, one of these patients was omitted as she was >44 years of age at the time of her MHC visit and two others were omitted because they were missing blood pressure measurements in their clinical record. Data were tabulated based on the new blood pressure criteria of normal (systolic < 120 mm Hg and diastolic < 80 mm Hg), elevated (systolic 120–129 mm Hg and diastolic < 80 mm Hg), stage I HTN (systolic 130–139 mm Hg or diastolic 80–89 mm Hg), and stage II HTN (systolic ≥140 mm Hg or diastolic ≥90 mm Hg). The Kruskal–Wallis test was used for continuous measures and the chi-square or Fisher exact test was used for categorical measures. An overall $p < 0.05$ was defined as statistically significant. All multiple comparisons were performed using the Bonferroni correction with $p < 0.0167$ defined as statistically significant for each of the three pairwise comparisons ([1] MHC HDP cohort to PE-NET control, [2] MHC HDP cohort to PE-NET preeclampsia, and [3] PE-NET preeclampsia to PE-NET control) conducted per variable. GraphPad Prism Version 6.07 was used for analyses.

Table 1 Reclassification of blood pressure in postpartum women in the MHC and in the PE-NET cohort

	MHC HDP cohort ($N = 265$)	PE-NET preeclampsia ($n = 110$)	PE-NET control ($n = 130$)	*p*-Value
Age (years)				
Mean (SD)	31 (5.4)	31.4 (5.8)	31.6 (4.1)	NS
Range	18–44	19–44	21–42	
Race, *n* (%)				
Caucasian	240 (90.9)	95 (86.4)	123 (94.6)	NS
Other	24 (9.1)	15 (13.6)	7 (5.4)	
Unknown	1	–	–	
Taking antihypertensive medication, *n* (%)				
Yes	15 (5.7)	7 (6.4)	–	<0.05[a,b]
No	250 (94.3)	103 (93.6)	130 (100)	
Blood pressure classification, prevalence (95% CI)				
Normal	28.7 (23.3–34.5)	38.2 (29.1–47.9)	73.8 (65.4–81.2)	<0.0001[a,b]
Elevated	5.7 (3.2–9.2)	7.3 (3.2–13.8)	3.8 (1.3–8.7)	
Hypertension: stage 1	37.3 (31.5–43.5)	35.5 (26.6–45.1)	21.5 (14.8–29.6)	
Hypertension: stage 2	28.3 (23–34.1)	19.1 (12.2–27.7)	0.8 (0.0–4.2)	
Hypertension, prevalence (95% CI)				
≥ 130/80 or medicated	67.2 (61.2–72.8)	56.4 (46.6–65.8)	22.3 (15.5–30.4)	<0.0001[a,b]
≥ 140/90 or medicated	31.3 (25.8–37.3)	20.9 (13.7–29.7)	0.7 (0.0–4.2)	<0.0001[a,b]

Abbreviations: CI, confidence interval; HDP, hypertensive disorders of pregnancy; MHC, Maternal Health Clinic; NS, nonsignificant; PE-NET, Pre-Eclampsia New Emerging Team; SD, standard deviation.
Note: All multiple comparisons were performed using the Bonferroni correction [0.05/3 for each pairwise comparison per variable].
[a]MHC HDP vs. PE-NET control < 0.0167.
[b]PE-NET preeclampsia vs. PE-NET control < 0.0167.

Results

Twenty-two percent of women in the PE-NET control group ($n = 130$) would now be classified with HTN (stage I + stage II + patients on antihypertensive medication with normal blood pressure), which aligns with the 19% of women between 20 and 44 years of age stated in the ACC-AHA guidelines (►**Table 1**). Less than 1% of the PE-NET control group would have been classified as having HTN using the old criteria of ≥140/90 mm Hg or on blood pressure medication. For women who had a pregnancy complicated by PE in the PE-NET ($n = 110$) or who were diagnosed with an HDP and followed up in the MHC ($n = 265$), 56.4 and 67.2%, respectively, would now be classified as having HTN (stage I + stage II + patients on antihypertensive medication with normal blood pressure) at 6 to 12 months postpartum. This is in contrast to the 20.9% of PE-NET PE women and 31.3% of MHC women with an HDP who were classified as having HTN based on the old criteria of ≥140/90 mm Hg or being treated with antihypertensive medication.

Discussion

The new ACC-AHA guidelines for the diagnosis of HTN recognize that there is no specific blood pressure threshold that is associated with vascular disease. It is well established that pregnancy and the postpartum afford a new window of opportunity for cardiovascular risk screening, leading to lifestyle modification (correcting dietary aberrations, physical inactivity, and excessive alcohol consumption) and therapeutic intervention for those who have treatable risk factors. With the new criteria, care providers should anticipate that approximately one-fifth of women without a complication in pregnancy will be diagnosed with HTN. For postpartum women who have had a pregnancy complicated by a hypertensive disorder, up to two-thirds, representing at least a doubling of the prevalence, will have diagnosable HTN. While lifestyle modification should still be the starting point for management, it is expected that many more women postpartum may eventually require therapeutic intervention in the form of antihypertensive medication as well as statin therapy. However, we should also be using the postpartum as an opportunity to promote a healthy lifestyle for all women, which should include a discussion about good nutrition, reduction of sodium intake, physical activity, appropriate body weight, and so on.

The new guidelines not only have longer term health implications from a treatment point of view postpartum but will also likely increase the number of women entering a future pregnancy with a diagnosis of HTN on some form of therapy.

Condensation

The new American College of Cardiology/American Heart Association guidelines will double the prevalence of hypertension postpartum.

Conflict of Interest

None.

References

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