

Evaluation of different blood pressure interpretation strategies and cutoff values to predict postpartum hypertension-related readmissions.

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Faculty Disclosure: Nothing to disclose

Introduction: American College of Obstetricians and Gynecologists (ACOG) suggests initiation of postpartum antihypertensive treatment to women with blood pressure (BP) $\geq 150/100$ mmHg, on two occasions at least 4-6 hours apart whereas the utility and validity of this strategy for prevention of hypertension-related readmission remains unknown.

Hypothesis: We hypothesized that different from ACOG's recommended BP interpretation strategies and BP cutoff points can predict postpartum hypertension-related readmissions with higher specificity and sensitivity.

Methods/design: A retrospective cohort of 24,917 women who delivered at a single midwestern academic hospital between 1/2009 – 6/2015. Of these, 3,830 women were identified as hypertensive and of those 112 (2.92%) were readmitted for hypertension management. BPs measured between delivery and 72 hours postpartum were used to evaluate three different BP interpretation strategies: 1) average BP exceeding the BP cutoff, 2) maximum BP exceeding the cutoff on one occasion, and 3) maximum BP exceeding the cutoff on two occasions at least 4 hours apart. The primary outcome was hypertension-related postpartum readmission. Receiver operating characteristic curves and the area under the curve (AUC) were used to measure the predictive value of these strategies.

Results: ACOG's recommendation of using BP $\geq 150/100$ mmHg as a cutoff point had a sensitivity 38% and specificity of 95% whereas following the Strategy 3 and reducing the cutoff value to 140/90 mmHg demonstrated 71% sensitivity and 84% specificity. The AUC for the three strategies: average BP exceeding the cutoff AUC 0.81; 95% CI: 76.95-85.08; maximum BP exceeded the cutoff on one occasion AUC 0.79; 95% CI: 74.7-82.81; maximum BP exceeded the cutoff on two occasions AUC 0.83; 95% CI: 79.83-87.24. The difference between the AUC curves of Strategy 2 and Strategy 3 was statistically significant ($p < 0.0001$).

Conclusions: The strategy of using maximum BP value exceeding the cutoff on two occasions at least 4 hours apart at lower cutoff values can predict readmissions with higher sensitivity and/or specificity. If the cutoff for the postpartum antihypertensive treatment initiation were lowered to BP $\geq 140/90$ mmHg it would significantly reduce postpartum readmissions.