Can Blood Pressure Self-Monitoring Improve Postpartum Management of Pregnancy-Associated Hypertension?

Jessica Sheehan Tangren

See related article, pp 425–432

Hypertensive disorders of pregnancy, including gestational hypertension and preeclampsia, affect 5% to 12% of all pregnancies around the globe and are a leading cause of maternal morbidity and mortality.[1] Although delivery of the fetus and placenta remains the only definitive treatment for preeclampsia, the sequalae do not end with delivery. Hypertensive disorders of pregnancy are long lasting and multigenerational: women with preeclampsia are at increased risk for future hypertension, cardiovascular disease, and end-stage renal disease; their offspring, if born premature or at low birth weight, are at increased risk for chronic disease in adulthood.[2,3] Clinical trials on the treatment and monitoring of hypertensive disorders of pregnancy have focused on the antepartum period. Historically, it was believed that blood pressure would progressively resolve with removal of the placenta, and few studies have addressed the issue of hypertension in the postpartum period. Now, there is recognition that hypertensive disorders of pregnancy can persist after delivery or arise newly postpartum, and many women treated for preeclampsia or gestational hypertension require large doses of antihypertensive medications after delivery.

In the current issue of *Hypertension*, Cairns et al[4] report the results of the SNAP-HT trial (Self-Management of Postnatal Anti-Hypertensive Treatment: a Trial Development Pilot Study)—a prospective, randomized open-label trial aimed to evaluate the feasibility of self-management of postpartum hypertension. Subjects were recruited from 5 National Health Service sites throughout the United Kingdom. Women ≥18 years of age with a diagnosis of gestational hypertension or preeclampsia who required ongoing treatment with antihypertensive medications after delivery were eligible for randomization to either a self-management program or usual care.

The self-management protocol developed by Cairns et al was adapted from the TASMIN (Telemonitoring and Self-Management in Hypertension) blood pressure self-management trials.[5,6] In TASMINH2 and TASMIN-SR, participants (with either uncomplicated hypertension in TASMINH2 or high-risk subjects, including those with cardiovascular disease, diabetes mellitus, and renal disease in TASMIN-SR) were randomized to a blood pressure self-management program or standard care. After 12 months, self-monitoring resulted in lower systolic blood pressure in both studies. In SNAP-HT, women allocated to the intervention monitored their blood pressure daily, in the morning, at home. Subjects entered their blood pressure readings into a smartphone-based telemonitoring system, which transmitted recordings to the study website and provided automatic feedback to the participant. Participants randomized to standard care had blood pressure monitored by a community midwife, and their hypertensive medications were adjusted by their primary care provider.

During the 1-year enrollment period, 59% (91/153) of eligible subjects approached enrolled in the study. Ninety percent (82/91) of subjects completed the trial. Women in the self-management group had lower mean blood pressure during follow-up (121.6/80.5 versus 126.6/86.0 at 6 weeks) and were also titrated off medications more quickly with a median treatment duration of 29 days in the intervention group and 41 days in the control group. At 6 months, only 3 women remained on antihypertensive therapy. Notably, the benefit of the intervention seemed to persist after antihypertensive therapy was stopped—the observed decrease in diastolic blood pressure in the intervention arm persisted at 6 months even though most women had been off all medication for >3 months.

There are a few limitations worth noting. The investigators developed a detailed monitoring and titration protocol, adapted from the NICE (National Institute for Health and Care Excellence) guidelines, and subjects were followed intensively during the 6-month follow-up period, including frequent home visits. This approach is unlikely to be feasible in larger clinical trials or translatable to general practice. This is especially true in settings where community midwives and home visits are uncommon. Additionally, almost all women in the trial were normotensive on first morning blood pressure within 2 months of delivery, fitting the currently accepted natural history of hypertensive disorders of pregnancy. However, a recent study of 24-hour ambulatory blood pressure monitoring between 6 and 12 weeks postpartum, reported in this journal, revealed high rates of nocturnal and masked hypertension in women with preeclampsia.[7] Although the American Heart Association has emphasized the need for screening and management of cardiovascular risk factors for women with a history of hypertensive disorder of pregnancy, the optimal type and frequency of screening measurements are debated. Although measurement of daily morning blood pressure assessment, as performed in SNAP-HT, seems to be a safe

From the Division of Nephrology, Department of Medicine, Massachusetts General Hospital, Harvard Medical School, Boston.

Correspondence to Jessica Sheehan Tangren, Division of Nephrology, Department of Medicine, Massachusetts General Hospital, Harvard Medical School, 7 Whittier Place, Suite 105, Boston, MA 02114. E-mail jtangren@partners.org

(*Hypertension*. 2018;72:296-297.
DOI: 10.1161/HYPERTENSIONAHA.118.11044.)

Hypertension is available at http://hyper.ahajournals.org
DOI: 10.1161/HYPERTENSIONAHA.118.11044

way to titrate medication in the postpartum period, this strategy is likely to miss women at increased cardiovascular risk. More intensive assessments of cardiovascular risk, including 24-hour ambulatory blood pressure monitorings, may be indicated in this population.

Multiple important conclusions can be drawn from the SNAP-HT. This randomized trial is the first to demonstrate the feasibility of a self-monitoring strategy for blood pressure in the postpartum period for women with hypertensive disorders of pregnancy. The trial met its prespecified feasibility end points, with both high recruitment (>50%) and low attrition (10%) rates. This is in stark contrast to protocols in the nonpregnant population (in TASMIN-SR, only 8% of invited participants were randomized) and challenges the long-held notion that pregnant women are reluctant to participate in clinical research. This pilot trial also identified that self-management shortened the duration of antihypertensive therapy while conferring long-lasting effects on blood pressure beyond the duration of medical therapy. Larger scale randomized controlled trials are clearly warranted, however, designed using a study protocol more translatable to general clinical practice, powered for clinical outcomes and with longer term follow-up to assess whether self-management can improve long-term cardiovascular health.

Disclosures

None.

References

1. Abalos E, Cuesta C, Grosso AL, Chou D, Say L. Global and regional estimates of preeclampsia and eclampsia: a systematic review. *Eur J Obstet Gynecol Reprod Biol*. 2013;170:1–7. doi: 10.1016/j.ejogrb.2013.05.005.
2. Ahmed R, Dunford J, Mehran R, Robson S, Kunadian V. Pre-eclampsia and future cardiovascular risk among women: a review. *J Am Coll Cardiol*. 2014;63:1815–1822. doi: 10.1016/j.jacc.2014.02.529.
3. Luyckx VA, Bertram JF, Brenner BM, Fall C, Hoy WE, Ozanne SE, Vikse BE. Effect of fetal and child health on kidney development and long-term risk of hypertension and kidney disease. *Lancet*. 2013;382:273–283. doi: 10.1016/S0140-6736(13)60311-6.
4. Cairns AE, Tucker KL, Leeson P, et al. Self-management of postnatal hypertension: the SNAP-HT trial. *Hypertension*. 2018:72:425–432. doi: 10.1161/HYPERTENSIONAHA.118.10911.
5. McManus RJ, Mant J, Bray EP, Holder R, Jones MI, Greenfield S, Kaambwa B, Banting M, Bryan S, Little P, Williams B, Hobbs FD. Telemonitoring and self-management in the control of hypertension (TASMINH2): a randomised controlled trial. *Lancet*. 2010;376:163–172. doi: 10.1016/S0140-6736(10)60964-6.
6. McManus RJ, Mant J, Haque MS, et al. Effect of self-monitoring and medication self-titration on systolic blood pressure in hypertensive patients at high risk of cardiovascular disease: the TASMIN-SR randomized clinical trial. *JAMA*. 2014;312:799–808. doi: 10.1001/jama.2014.10057.
7. Ditisheim A, Wuerzner G, Ponte B, Vial Y, Irion O, Burnier M, Boulvain M, Pechère-Bertschi A. Prevalence of hypertensive phenotypes after preeclampsia: a prospective cohort study. *Hypertension*. 2018;71:103–109. doi: 10.1161/HYPERTENSIONAHA.117.09799.

Hypertension
Journal of the American Heart Association

Can Blood Pressure Self-Monitoring Improve Postpartum Management of Pregnancy-Associated Hypertension?

Jessica Sheehan Tangren

Hypertension. 2018;72:296-297; originally published online July 2, 2018;
doi: 10.1161/HYPERTENSIONAHA.118.11044
Hypertension is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231

Print ISSN: 0194-911X. Online ISSN: 1524-4563