Implementing Home Blood Pressure Into Practice
What More Do We Need?

Lawrence R. Krakoff

See related article, pp 1081–1086

The growing worldwide epidemic of high blood pressure in both developed and developing nations is a challenge on many levels. The need for better prevention of cardiovascular disease through control of hypertension is clear. Public awareness of the need to treat hypertension is partly reflected by the widespread purchases of home blood pressure devices in several of the developed countries. In the United States, Japan, and Finland, the estimates are that 55% to 75% of hypertensive patients already have a home device. Research studies have provided a robust epidemiological basis for supporting the greater accuracy of home blood pressure monitoring (HBPM) compared with clinic pressures for prognosis of fatal and nonfatal cardiovascular disease in long-term follow-up surveys and in cross-sectional designs.

There is a general consensus that HBPM is more convenient, available, and less costly than ambulatory blood pressure monitoring, but the superiority of ambulatory blood pressure monitoring for special clinical problems (ie, detection of nondippers or need for sleep pressures in chronic renal disease, autonomic neuropathies, and sleep apnea) is also clearly recognized. Surveys of both physicians and patients suggest that HBPM is both appreciated and recognized as a valuable strategy. Several experts in the field of hypertension research and care have put forth to those on the front lines of primary care in this regard? The report published in this issue of Hypertension by Niiranen et al is directly relevant to this question.

The Finn-Home Study is a prospective survey that links home blood pressure measurement at its baseline with long-term outcomes. It is one of the more robust studies for establishing the superiority of HBPM for prognosis of cardiovascular disease compared with clinic pressures. In the current report, measurements of HBPM at the start of the Finn-Home Study have been dissected to answer a very practical question: how many home blood pressure measurements are needed to establish an accurate prognosis? Is time of day, morning or evening, a factor in this regard? By having a full week’s measurements taken in both the morning and the evening, the Finn-Home investigators could parse these issues and arrive at conclusions that are applicable to clinical practice.

The protocol for the Finn-Home baseline assessment of HBPM called for 7 days of measurements, twice in the morning and twice in the evening, for a maximal total of 28. The analysis evaluated 1 to 7 days and morning and evening measurements together and separately in arriving at the best correlation with eventual cardiovascular events. The optimal risk relationship was found for the highest number of measurements, but the risk relation calculated after only 3 days (12 measurements) was almost as accurate. Eliminating the first day had little effect, and comparison of morning and evening pressures likewise had no effect on the accuracy of prognosis. These results are consistent with a variety of epidemiological studies using clinic pressure with correction for regression dilution because of small sample size and from ambulatory blood pressure research in which more measurements per patient are available. It is the usual or average blood pressure that best predicts long-term event rates. When HBPM is used for initial risk evaluation, clinicians need a minimum of 3 days of measurement; the full 7 days would seem to add little to the prediction. Is that the whole story?

Multiple measurements of blood pressure permit calculation of an average, and that average is used for diagnosis and treatment, but what of the variation between pressures that is reflected by the SD or coefficient of variation (SD/average)? Past studies suggested that the variation in pressure added little to prognosis. However, recent reports suggest that this issue needs reconsideration. A retrospective look at within-subject variability of blood pressure and heart rate in the
Japanese prospective Ohasama Study of home blood pressures found that day-to-day higher variability (SD) in systolic and diastolic blood pressures was independently correlated with increased cardiovascular mortality and stroke mortality. The same pattern was observed whether variability was defined by the SD or the coefficient of variation. The average age at entry in the Finn-Home Study was similar to that of the Ohasama Study, 56 to 58 years, so that the 2 may be compared if the analysis of variability in Finn-Home can be conducted. If variability of home pressures is indeed an important prognostic measure, enough pressure measurements will be needed for an accurate SD, as well as for the average pressure.

Another reason for a second look at variability of blood pressure and prognosis comes from retrospective analysis of visit-to-visit differences in blood pressure from 2 large clinical trials. Increased visit-to-visit variability in pressure was highly correlated with occurrence of stroke in the United Kingdom Transient Ischemic Attack Aspirin Trial and stroke and coronary heart disease in the Anglo-Scandinavian Cardiac Outcomes Trial-Blood Pressure Lowering Arm. A weaker relationship was found for variability and risk as assessed by ambulatory blood pressure monitoring and event rates in the Anglo-Scandinavian Cardiac Outcomes Trial-Blood Pressure Lowering Arm. There are many good reasons for not considering visit-to-visit variability as providing the same information as variability in 24-hour ambulatory recording or 3- to 7-day HBPM. Increased variability in visit-to-visit pressures may simply be a surrogate for poor adherence to treatment. Nonetheless, variability in blood pressure has become a suspect risk factor for prediction of risk and for assessment during treatment as well. HBPM may well be ready for “prime time” in management of many hypertensive patients by using average pressures over a 3- to 7-day period, as suggested by results from the Finn-Home Study.

Disclosures

None.

References

Implementing Home Blood Pressure Into Practice: What More Do We Need?
Lawrence R. Krakoff

Hypertension. 2011;57:1043-1044; originally published online April 11, 2011;
doi: 10.1161/HYPERTENSIONAHA.110.163493

Hypertension is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2011 American Heart Association, Inc. All rights reserved.
Print ISSN: 0194-911X. Online ISSN: 1524-4563

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://hyper.ahajournals.org/content/57/6/1043

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Hypertension can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Hypertension is online at:
http://hyper.ahajournals.org/subscriptions/