How Can We Use the Results of Ambulatory Blood Pressure Monitoring in Clinical Practice?

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After the landmark study by Perloff et al., other investigations showed that ambulatory blood pressure (ABP) is superior to office blood pressure (BP) for cardiovascular risk stratification in untreated and treated hypertensive subjects.2,3 Also as a consequence of these outcome-based studies, Medicare and Medicaid approved limited and partial ABP monitoring for reimbursement in patients with suspected white coat hypertension (WCH), considering the technique necessary to determine the appropriate management of the patient.

In this issue of Hypertension,4 Dolan et al extend the current database on the prognostic value of ABP in hypertensive subjects with the results of the Dublin Outcome Study, a large observational registry of subjects who underwent ABP before treatment and were subsequently followed-up for up to 20 years. Most of these subjects had elevated office BP at entry. During the follow-up period there were 646 deaths, 389 of which were caused by cardiovascular causes, and this huge number provided the opportunity to examine for the first time the value of ABP for prediction of cardiovascular mortality in a large population. After correction for other risk factors, ABP was superior to office BP for prediction of cardiovascular mortality and nighttime ABP was the most potent ABP component for prediction of outcome.

How to Use ABP Data in the Clinical Practice?
The clinical use of ABP in individual subjects to optimize their management is not so simple and immediate. On one hand, the traditional measurement of BP in the doctor’s office will continue to mark the starting point for our clinical decisions because the available evidence on the clinical value of BP is almost entirely based on office BP readings. On the other hand, there is now solid evidence that self-measured BP and ABP can effectively refine risk stratification. From a clinical standpoint, the real challenge is to combine information from office BP and ABP in individual patients to improve risk stratification and base clinical decisions, also taking into account other indicators of cardiovascular risk. In their study,1 Perloff et al plotted office BP versus the average daytime ABP and, for every value of office BP, the risk of cardiovascular events was significantly higher in the subjects with higher than predicted ABP compared with those with lower ABP. Such an approach is logical, simple, and appealing for clinical use.

Widely used arbitrary categories based on ABP are the “WCH/ambulatory hypertension” classification and the “dippers/nondippers” classification.2 WCH identifies subjects whose risk of major cardiovascular complications appears to be closer to the healthy normotensive subjects than to that of the subjects with ambulatory hypertension.2,3 In a study, the incidence of stroke in the long-term was not dissimilar in subjects with WCH and ambulatory hypertension.6 In the absence of intervention studies comparing an ABP-based strategy with a traditional strategy in these subjects, no firm recommendations can be made with regard to the clinical management of WCH. Drug treatment might be judged unnecessary in many of these subjects, particularly in those with low levels of total cardiovascular risk.2,5 On the other side of the coin, a “nondipping” pattern is strongly predictive of a higher risk of major cardiovascular events2,7 and should therefore prompt aggressive management of modifiable risk factors. Nighttime BP is more potent than daytime BP for prediction of cardiovascular mortality.8 Again, however, the recommendation to be more aggressive in patients with elevated nighttime BP is not based on intervention studies. To complete the picture, high values of ambulatory pulse pressure, particularly >53 mm Hg, denote a high cardiovascular risk at any level of concomitant risk factors.8

Figure 1 presents an algorithm for the clinical use of home BP and ABP in untreated hypertensive subjects. The combined clinical use of home BP and ABP to guide clinical decisions had been proposed previously.9,10 Self-measured home BP might be considered as a first-line procedure to identify high-risk subjects as reasonable candidates for drug treatment. Self-measured home BP has an independent prognostic value11 and it is also appropriate for self-monitoring of BP in the long-term. In the subjects with normal home BP, 24-hour ABP monitoring may also be used to identify low-risk individuals with WCH. These subjects may be candidates for lifestyle measures without drug treatment if they are free of diabetes, target organ damage, and other cardiovascular risk factors. However, a nondipping blood pressure pattern or an elevated 24-hour pulse pressure in subjects with ambulatory hypertension would identify high-risk individuals who should commence drug treatment without delay. Indications from guidelines would remain mandatory in subjects with intermediate risk on the basis of ABP, as well as in subjects with WCH and associated risk factors.
These considerations refer to untreated subjects with elevated office BP, whereas fewer data exist in people treated for hypertension. In these subjects, an average 24-hour or daytime systolic BP of 135 mm Hg or higher was associated with increased cardiovascular risk even after adjustment for other risk factors.2,4

Studies on the prognostic value of ABP in the general population,11–13 although valuable, are quite difficult to use for the clinical management of hypertensive patients. These studies, which produced conflicting results,11–13 included a variable proportion of treated and untreated hypertensive subjects and a variable proportions of individuals with previous cardiovascular disease.11–13

What to Conclude?

The prognostic value of ABP in hypertension is supported by several outcome-based studies. The routine use of ABP monitoring in all subjects with hypertension is perhaps still premature,10 but it should be increasingly considered, particularly in untreated hypertensive subjects in whom a decision regarding risk stratification and initiation of drug treatment is fundamental. To this purpose, validation of clinical categories based on ABP should be encouraged in future investigations. Of utmost importance, we need intervention studies to ascertain whether a therapeutic strategy based on ABP is superior to a strategy based on office BP for prevention of cardiovascular disease.

References

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_Hypertension._ 2005;46:25-26; originally published online May 31, 2005;
doi: 10.1161/01.HYP.0000170139.90918.50
_Hypertension_ is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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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:
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