Measurement of blood pressure outside of the clinic is recognized for providing superior accuracy in predicting future fatal and nonfatal cardiovascular and renal disease. The gold standard for these predictions is 24-hour ambulatory blood pressure monitoring that measures daytime and nighttime pressures. Home blood pressure monitoring has rapidly made progress because devices for recording pressures taken at home have improved and become widely available. The advantages for this strategy are that pressures can be recorded during many days, weeks, and months. The newer devices can send results to a data center or individual care providers for review and management. In this sense, telemedicine has arrived for care of hypertension and seems to have made a successful landing. With the increasing need for primary care physicians, especially in the United States, telemedicine for hypertension may become a valuable alternative for management of hypertension.

An important issue for management of hypertension has been whether the relationship between the clinic pressures and out-of-clinic pressures provides useful information. When this comparison discloses that clinic pressure is significantly higher than out-of-office pressure, that is, a white-coat effect, is the prognosis truly better? When the office pressure is lower than the out-of-office pressure (masked effect), is the predicted outcome worse? The accuracy of these classifications might be enhanced by combining data from many centers into a registry for examining trends during the long-time intervals needed for precision in prognosis. Large registries can be analyzed for relevant subgroups, age ranges, sex, presence and absence of risk factors, and status of treatment among others. Ideally, these data sets will include changes highly relevant to outcomes such as serial blood pressure measurements, treatment effects, and status of other risk factors.

In this issue of Hypertension, Stergiou et al report the development of a registry for home blood pressure measurements and describe the long-term risk of cardiovascular disease and mortality in relation to baseline classification of normal, white-coat hypertension, masked hypertension, and sustained hypertension. The registry has been integrated from 5 international centers enrolling ≈6500 participants followed up for an average of 8.3 years after enrollment; 23% were already being treated for hypertension, whereas the larger fraction was untreated at the baseline evaluation. Results for the treated and untreated cohorts are reported separately. Several of these centers have reported their own observations; however, the aggregation in this registry is the largest combined experience to date.

For the untreated groups, average home blood pressures ranged from 114/73 mm Hg in normal blood pressure to 148/90 mm Hg in sustained hypertensives. Average home blood pressures in those with white-coat hypertension were clearly above that of the normals but less than that of the masked or sustained hypertensives. Cardiovascular event rates were clearly related to these pressures as described in the Tables and the Figure, panel a. Total mortality was similar for masked and sustained hypertensives despite lower blood pressure by ~8/13 mm Hg (systolic/diastolic) in masked hypertension. The authors recognize the limitations of their study in being unable to address the following questions for the time being. During the 8-year follow-up, how many normals and white-coat hypertensives eventually became masked or sustained hypertensives? Were they treated? What was their control rate over time? For the masked and sustained hypertensives, how many were treated and what were the response rates? Baseline measurements may be misleading.

To this reader, the most striking finding is found in the analysis of treated groups. The controlled cohort had similar pressures to the white-coat group and similar event rates. In striking contrast, treated masked hypertensives had higher cardiovascular events and total mortality compared with sustained hypertensives; however, their home pressures were lower than that of the sustained hypertensives. It is likely that the lower office pressures of the masked group led to less intense treatment. One might dismiss these findings because of the smaller numbers of treated participants. However, the striking lack of the usual trend for event rates to parallel blood out-of-office pressures’ prompts alternate speculation.

The specific mechanisms and characteristics accounting for masked hypertension remain to be defined. Work stress cannot alone be indicted, as home blood pressure monitoring protocols usually call for measurements at home in the morning and evening before and after work hours. Whatever the background factors, one feature stands out with regard to treated hypertensives; their adherence to antihypertensive medication is rarely assessed. Adherence to medication...
during treatment of hypertension is a major and worrisome issue that is not well characterized in usual practice. Some patients increase adherence in anticipation of a visit to their provider, that is, white-coat adherence. Thus, the clinic pressure would inadequately reflect usual pressure between clinic intervals, unless out-of-clinic pressures were taken on a regular basis between visits. Does white-coat adherence reflect a more general trend of erratic medication because of failure to renew prescriptions or to refill medication that sits unbothered in the medicine cabinet? In the United States, prescription renewal is often automatic whether or not the previous prescription has been used up. Does erratic medication contribute to higher pressures and increased blood pressure variability? Does increased variability then independently contribute to higher event rates?

Home blood pressure monitoring is rapidly gaining acceptance with or without other clinical support strategies for better management and control of hypertension. The information gained from Stergiou et al in developing their registry is a step forward with promise that substantial augmentation will be informative. In particular, the relationship between on-treatment pressures and outcomes is crucial. This seems most important for masked hypertension as indicated above. On-treatment home monitoring may be helpful in high-risk hypertensives, particularly those with diabetes mellitus, coronary heart disease, and the elderly in establishing appropriate goals for treatment, now that there is compelling evidence for a J-U curve relating on-treatment pressure to outcomes in these groups. Expanding the registry to include serial on-treatment home blood pressure monitoring should lead to more compelling information for increasing or decreasing intensity of treatment.

Some of the issues given in the opinions and suggestions stated above might theoretically be investigated through randomized clinical trials. However, the value of an expanded registry for home blood pressure monitoring has the advantage that it provides real-world data reflecting actual practice. Results from such surveys are often the source of testable hypotheses for which randomized trials, expensive and time-consuming as they are, may be appropriately designed, when truly needed.

Disclosures
None.

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Home Blood Pressure Monitoring: International Recognition
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_Hypertension._ 2014;63:670-671; originally published online January 13, 2014;
doi: 10.1161/HYPERTENSIONAHA.113.02886

_Hypertension_ is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2014 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:
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