Ambulatory Blood Pressure Monitoring for Routine Clinical Practice

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“The inherent variability of the blood pressure has led to problems in the diagnosis, treatment, and prognosis of hypertension. Knowing how the blood pressure fluctuates with the stresses and strains of everyday life should help in assessing the severity of hypertension, the response to treatment, and the prognosis in individual cases.”

—Hinman et al; 1962.

It has taken 40 years for the ideas first proposed in this quote from an article on a new portable device for recording blood pressure (BP) to be considered for routine clinical practice. However, it did not take this long for astute researchers to recognize the importance of the development of this portable BP recorder, later known by the name of its manufacturer, the Rempler Company.

By 1966, Maurice Sokolow et al had used the semi-automated Rempler device to compare casual office BP with readings taken during awake hours in 124 patients with a diagnosis of hypertension. \(^2\) Despite the rather primitive technology by today’s standards, Sokolow et al were able to show that the ambulatory BP was a better predictor of hypertensive complications than the casual office BP. Sokolow and colleagues followed-up on this initial observation with a prospective observational study comparing the predictive power of the standard office BP versus the Rempler device in 1076 patients with essential hypertension for cardiovascular outcomes over a mean 5-year period. This second study confirmed their original observations that ambulatory BP monitoring (ABPM) was a more accurate predictor of outcome than the office BP.

After the publication of these remarkable results, it took more than a decade before more sophisticated, fully automated recording devices made it possible to perform 24-hour ABPM in routine clinical practice. However, clinicians seemed reluctant to accept ABPM, possibly because the publications of Sokolow et al represented the only evidence to support this belief. \(^4–13\) In each instance, the 24-hour ambulatory BP was able to predict those patients at higher risk for experiencing a cardiovascular event with greater precision than did the office BP. One of the limitations of these studies was that the sample population was generally composed of hypertensive patients and may not have been representative of the general population. Exceptions include the Ohasama study, \(^5,9\) which followed-up 1542 men and women residing in Japan, and a Swedish study \(^12\) involving 578 men living in the city of Uppsala.

The present report by Hansen et al \(^14\) extends the generalizability of these results further by demonstrating the benefits of ABPM in predicting cardiovascular outcome in men and women in a general population of 1700 individuals residing in an urban European center. These authors noted that only ABPM and not office BP was a significant predictor of all-cause and cardiovascular mortality during a mean follow-up period of 9.5 years.

These findings are noteworthy in that they come at a time when 24-hour ABPM is being welcomed as having an important role to play in the diagnosis of hypertension. Medicare and Medicaid recently acknowledged the advantages of 24-hour ABPM over the office BP by approving funding for this procedure in patients suspected of having white-coat hypertension. The recent report from the Subcommittee of Professional and Public Education of the American Heart Association Council on High Blood Pressure Research\(^15\) highlights the importance of using out-of-office measures of BP in making a diagnosis of hypertension. In addition, virtually all national and international guidelines for the diagnosis and treatment of hypertension at least mention 24-hour ABPM, noting its superiority over the office BP in diagnosing hypertension.

Despite the evidence provided by the current report of Hansen et al \(^14\) and other publications, \(^4–13\) it is somewhat surprising that 24-hour ABPM has still not become an integral step in making a diagnosis of hypertension. None of the major hypertension guidelines has included ABPM in algorithms for diagnosing hypertension, leaving the role of ABPM to be discussed in a separate paragraph/section elsewhere in each guideline monograph.

The Canadian Hypertension Education Program (CHEP) in the 2005 revision of its recommendations for the diagnosis and treatment of hypertension\(^16\) has decided to recommend 24-hour ABPM and self (home)-BP monitoring as options for
making a diagnosis in patients with uncomplicated mild to moderate essential hypertension initially detected by routine office readings. Using an evidence-based approach, the CHEP Task Force concluded that there were sufficient data available to recommend a greater use of ABPM and self-BP monitoring in routine clinical practice. In addition, inclusion of ABPM and self-BP monitoring into the main diagnostic algorithm would facilitate a more rapid diagnosis of hypertension and reduce the risks of having patients being left untreated for prolonged periods while a diagnosis of hypertension was being made using repeated office readings.

Resistance to abandoning the mercury sphygmomanometer as the gold standard for diagnosis hypertension has been quite remarkable. One can only hope that reports such as that of Hansen et al\textsuperscript{14} will finally lead to the inclusion of 24-hour ABPM into the diagnostic algorithm in all national and international guidelines for managing hypertension. Only then will the prescient conclusions made by Sokolow et al\textsuperscript{2} almost 40 years ago have received appropriate recognition: “Portable recorder measurements should aide in selecting patients likely to benefit from antihypertensive therapy and in guiding such treatment.”

References

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