



Ambulatory Blood Pressure Monitoring or Self Pressure Evaluation: What's Better?

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Abstract

Background: In clinical practice, there are numerous devices capable of detecting blood pressure continuously for periods of time ranging from 24 hours to 240 hours (ABPM). These devices constitute an alternative choice compared to the more common home self-monitoring. In our evaluation we compared the pressure profiles resulting from the intensive self-measurements (12 times a day) of the patients with the measurements coming from the ABPM evaluations.

Methods: A consecutive group of 200 patients was subjected to ABPM and invited the following day to perform a home blood pressure monitoring performed 12 times (HBPM) 1 hour apart. All patients were recruited from 5 general practitioners and 1 specialist cardiology clinic. All patients were selected solely on the basis of being hypertensive and were aged between 18 and 75 years. The data obtained from each method were compared.

Results: The measurements obtained by HBPM were comparable to those obtained by ABPM, without any statistically significant difference.

Conclusions: HBPM can be a valid alternative to ABPM with undoubted advantages for the patient: lower costs, easy execution, reduction of waiting times, it does not require the intervention of healthcare personnel.

Keywords: ABPM; HBPM; Ambulatory blood pressure monitoring; Self pressure Evaluation

Introduction

In recent decades, a large number of studies have accumulated that have allowed the recognition of arterial hypertension as one of the main known cardiovascular risk factors. Clinical blood pressure measurement is the cornerstone of the diagnosis of arterial hypertension. Despite the refinement of knowledge on this risk factor, some limitations remain on the use of clinical pressure. It is known, in fact, that blood pressure is subject to fluctuations over the course of 24 hours. This variability casts doubt on the objectivity of a therapeutic choice based on a single or a few measurements taken in the clinic. It has also been shown that the patient's alarm reactions upon measurement by healthcare

personnel can cause a rapid increase in blood pressure (white-coat effect) [1]. This phenomenon can lead to therapeutic excesses with consequent hypotensive episodes. The elderly patient who has a reduced capacity for self-regulation is particularly at risk of orthostatic hypotension [2,3]. To overcome these limitations, two methods have been introduced into clinical practice: ambulatory monitoring (ABPM) and home blood pressure self-monitoring (HBPM). One of the biggest differences between ABPM and HBPM is the ability to collect data at night. Data on nocturnal blood pressure can be a strong indicator of the risk of cardiovascular disease and are so far only detectable through the ABPM. The results of the Japanese J-HOP multicenter study, however, indicate that nocturnal pressure can also be detected by

HBPM, with a prognostic value similar to that shown by prospective studies conducted with ABPM [4]. Also in the new guidelines of the European Society of Cardiology (ESC), HBPM is indicated for the diagnosis of arterial hypertension and for monitoring the response to therapy [5]. One of the advantages of HBPM is the ability to identify patients who are hypertensive when measured in the clinic but normotensive at home and those who, on the other hand, are hypertensive only when measured at home (masked hypertension). The Ohasama study published in 2006 showed that white coat hypertension actually carries a double risk of developing outright hypertension compared to normotensive subjects [6]. This risk was also confirmed by the PAMELA study, published in 2006 in the scientific journal Hypertension [7]. The white coat effect also appears more common with advancing age. The weight of “masked” hypertension appears even more relevant, as its direct negative effect on mortality and morbidity is demonstrated. The aim of our study is to compare the blood pressure results detected by HBPM with those obtained by ABPM in a group of patients followed at home.

Methods

200 consecutive patients with hypertension were recruited from 5 general practice and 1 specialist clinic. All the patients recruited were aged between 18 and 75 years, and the only inclusion criterion used was the presence in a history of essential arterial hypertension. All health professionals involved participated in two training sessions for education and alignment of recruitment. The average age of the patients was 63.7 years (31-74 years), of which 89 males and 111 females (Table 1).

Table 1: Characterizes of patient.

Mean age	63,7 years
Range	18-75 years
Male/female	89/111
Hypertension	100%

Patients were instructed on self-monitoring of home pressure by family doctors and subjected to ABPM the day before. All patients were asked to record the values measured every hour for 12 hours in a special diary. At the end of the study, the values obtained through the HBPM were compared with those obtained through the ABPM. For the comparisons, a statistical analysis was carried out with chi-square test and excel software. The data indexing was carried out in Excel in the reference specialist center by the coordinating doctors of the clinical study. All patients have signed an informed consent for the processing of personal data as per European directive. Being a diagnostic investigation consonant with the pathology, bloodless and inserted in the

normal path of hypertensive patients, it did not require evaluation by the ethics committee

Results

The blood pressure values detected by self-measurement proved to be superimposable to those collected by evaluation through ABPM. The ABPM was able to collect the values in all patients evaluated, with an average of 68 measurements valid per registration. The HBMP was validated in 189 patients with 12 measurements, in the residuals 1 with 11 evaluations in the day's chorus. A standard deviation of the values was calculated using the excel formula, and no different variability was found between the two series of evaluations. The point data were classified in a comparative graph visible in figure (Figure 1).

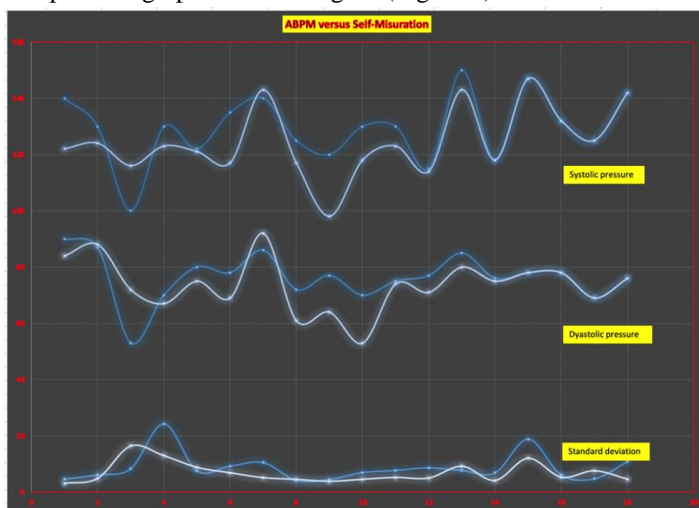


Figure 1: Comparative evaluation of systolic pressure, diastolic pressure and standard deviation of the misuration revealed between ABPM or HBPM.

Discussion

The values considered to be normal cut-offs are different for clinical (<140/90 mmHg) and home (<135/85 mmHg) blood pressure [5]. Home self-measurement is therefore establishing itself as a monitoring method thanks to an ever-increasing number of devices available on the market and greater patient education regarding risk factors such as hypertension or dyslipidemia. There is now a wide choice of automatic devices for self-measurement of blood pressure, all based on the use of the oscillometric method. The advantages provided by HBPM are manifold. In several studies, HBPM was found to be more closely associated with cardiovascular risk than with clinical pressure [8-13]. Self-monitoring also allows the execution of multiple measurements at different times of the day, reducing confounding factors such as the white coat effect, directly evaluating the patient in his daily environment. An advantageous implication, demonstrated in an increasing number of studies, appears to be the increase in patient

adherence to therapy [14,15]. In fact, active participation in monitoring induces patients to become more involved in their therapeutic path. Furthermore, an increasing number of studies indicate that self-monitoring favors the achievement of therapeutic goals [16-18]. In the elderly patient, the usefulness of HBPM is increased by the higher incidence of hypertension from lab coats in these age groups, as well as by the greater blood pressure variability, a factor that makes it necessary to perform multiple repeated measurements to provide true average values. Blood pressure variability is also in itself a known cardiovascular risk factor, especially in the elderly patient, especially if associated with a marked increase in the morning or "morning surge" [19]. As already mentioned, the greater percentage of elderly people with white coat hypertension can cause therapeutic excesses when therapy is titrated to clinical rather than home values. The decreased self-regulatory capacity of circulation in the elderly favors the onset of hypotensive episodes, which can lead to falls and fractures. In our study we wanted to compare the values recorded at the HBPM with those obtained through the ABPM. The average pressure reported using each method is shown in table 2. As can be seen from the graph (graph 1) there is a substantial overlap of the values. These data suggest that the measurements obtained using the HBPM are comparable to those obtained using the ABPM. The HBPM therefore made it possible to obtain reliable values using very simple tools, within everyone's reach and immediately available. In fact, the HBPM does not require expensive tools and is easily performed by the patient without any intervention by the doctor or other healthcare personnel.

Conclusions

The HBPM is currently supported by solid scientific evidence, although adequate patient training is essential. Our data encourage the use of HBPM as a complementary method to clinical pressure for the diagnosis and monitoring of arterial hypertension. The values obtained using this method have in fact the same accuracy as those recorded using the AMPM, but compared to the latter it has numerous advantages for the patient: low cost, immediate availability, ease of use, it can be performed directly by the patient. In addition, the HBPM can be a valuable tool for tele monitoring.

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