COMMENTARY

How should ambulatory blood pressure measurement be used in general practice?

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1 | INTRODUCTION

Current guidelines on hypertension now accept that ambulatory blood pressure (BP) measurement (ABPM) is the measurement method of choice for diagnosing hypertension. The technique has been shown to be more accurate and more cost effective than office BP (OBPM) or self-measurement of BP (SBPM). The diagnostic superiority of ABPM derives mainly from the ability of the technique to identify sustained hypertension by allowing for the exclusion of white-coat hypertension and by demonstrating the presence of masked hypertension. ABPM also offers diagnostic insights into nocturnal patterns of BP, and, despite less attention being given to nighttime BP in clinical practice, the increased risk of stroke with elevated nocturnal BP makes it important to assess the response to BP-lowering medication during sleep. Surprisingly, although current guidelines give detailed recommendations on the diagnostic potential and use of ABPM, there are scant recommendations on the benefits and application of the technique for the initiation of BP-lowering therapy in clinical practice and virtually no recommendations as to how it might be used to assess the efficacy of drug treatment and guide the prescribing physician on the most appropriate drug administration and dosage over time. Furthermore, the limited availability of ABPM to date has confined its use to the diagnosis of hypertension, rather than applying the technique to gauging more reliably the response to treatment, especially in patients at high risk, who may be taking a number of BP-lowering drugs. The increasing approval of ABPM for reimbursement in many countries is an overdue and welcome initiative, which, although incurring substantial initial short-term costs, will lead to improved BP control in the longer term and substantial savings in the prevention of the cardiovascular (CV) consequences of hypertension, most especially the prevention of stroke. However, we are now faced with a responsibility to use ABPM to achieve the maximum benefit, without applying the technique excessively.

2 | ABPM FOR THE DIAGNOSIS OF HYPERTENSION

The US Preventive Services Task Force,1 the UK National Institute for Health and Care Excellence,2 the European Society of Hypertension,3 and the Canadian Hypertension Education Program4 have each carefully examined the evidence as to which method of BP measurement is best—OBPM, SBPM, or ABPM—and each has concluded that ABPM (or SBPM if ABPM is declined or not tolerated) should be performed in anyone who has had an elevated BP measurement ≥140/90 mm Hg recorded by any method of measurement. The rationale behind this recommendation is basically to confirm that the elevation of BP noted with out-of-office measurement is sustained and not due to a white-coat reaction, as may occur in some 25% of patients.5 Therefore, there is no disagreement but that ABPM should be offered to all patients before prescribing BP-lowering medication.

3 | ABPM TO DETERMINE EFFICACY OF TREATMENT

We now move into uncharted waters as none of the guidelines make definitive recommendations regarding how to use ABPM to initiate and assess the response to antihypertensive drug treatment in spite of there being sound evidence that ABPM can be extremely helpful in this regard. The largest study to date on the use of ABPM to guide treatment in primary care comes from Spain, where a nationwide project to promote the use of ABPM in primary care settings was established a decade ago.6 This study showed that ABPM identified the patients for whom medication was needed and resulted in an overall reduction in the number of patients treated for hypertension. The conclusion was that ABPM can save money and that the extra costs of providing the technique were more than offset by cost savings from better targeted treatment.7
The therapeutic possibilities are shown in Figure 1 and summarized in Figure 2.

### 3.1 Patient with high OBPM and normal ABPM profile

The patient in Figure 1A has white-coat hypertension, which may not be a totally benign phenomenon and which may in time progress to sustained hypertension that will require treatment. It is appropriate, therefore, to repeat ABPM at yearly intervals, which, in practice, will amount to about 25% of patients with an elevated OBPM.\(^8\)

### 3.2 Patient with high OBPM and mildly elevated ABPM profile

The decision in Figure 1B might be to try lifestyle modification if the patient is younger than 50 years and if the overall CV risk is low, in which case ABPM should be repeated in a year. If, on the other hand, the CV risk is high (e.g., evidence of target organ damage, previous CV event, family history, obesity, unhealthy lifestyle, or comorbidities such as diabetes), treatment should be initiated with a repeat ABPM in 6 months to assess 24-hour BP control.

### 3.3 Patients with high OBPM and significantly elevated ABPM profile

In cases such as that seen in Figure 1C, treatment is clearly indicated and if treatment is already prescribed, it should be intensified and consideration given to exclusion of secondary hypertension or noncompliance with therapy. In either event, ABPM should be repeated in 1 to 2 months until a normal 24-hour profile is achieved and if there is a poor response to treatment, referral for further evaluation should be considered. Once 24-hour BP control is obtained (Figure 1D), it would be reasonable to repeat ABPM every 6 months to ensure optimal 24-hour BP control. Based on Irish data, which should be similar in other countries, this level of hypertension on ABPM might be anticipated in only about 13% of patients,\(^8\) but, in these patients who are at the highest risk of having a CV event, such as stroke, repeated ABPMs are justified to ensure that effective BP control over the 24-hour period is achieved as soon as possible.
3.4 | Excessive BP lowering

There is another aspect of treatment that merits consideration, namely, excessive lowering of BP, especially nocturnal pressure. Recent evidence suggests that excessive elevation of nocturnal BP carries an adverse CV risk, but that a group of patients may be adversely affected by excessive lowering of nocturnal BP. In these patients, the vasculature to the heart, and/or brain, may be compromised by atherosclerotic disease that leaves the patient dependent on a critical level of BP to maintain adequate perfusion. It is important, therefore, to use ABPM to prevent excessive BP lowering with medication, especially at night.

4 | SBPM TO ASSESS EFFICACY OF TREATMENT

SBPM is recommended as an alternative to ABPM if the latter is not available. However, in substituting SBPM for ABPM it must be emphasised that to obtain an SBP equivalent to mean daytime ABPM, it is necessary to obtain the mean of 6 days of SBPM measurements (2 readings per day) after discarding the measurements from the first day. This is regarded by many patients (and doctors) as being more onerous than performing ABPM, which provides nocturnal BP measurements that are increasingly important in assessing BP control.

5 | CONCLUSIONS

The recent provision of reimbursement for ABPM in primary care is a welcome initiative that will lead to better BP control. Although the international guideline recommendations clearly stipulate the diagnostic indication for ABPM (any person who has had a BP level ≥140/90 mm Hg), there are no clear recommendations for the use of ABPM to guide BP-lowering therapy. In this commentary, we have made recommendations as to how ABPM might be used to initiate treatment and to assess the efficacy of BP-lowering therapy over time. In doing so, we recognize that there will be a high cost initially, but that this should be more than offset by improved BP control and the reduction of CV consequences of hypertension. However, to achieve this, consideration should now be given to the central storage of ABPM data to provide national registries of hypertension.

CONFLICT OF INTEREST

None.

REFERENCES