



Diagnosis and Evaluation of Hypertension Control in Dakar: Role of Ambulatory Blood Pressure Measurement

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Abstract

Introduction: Hypertension is a major public health problem in Sub-Saharan Africa. Current recommendations place particular emphasis on ambulatory measures compared to clinical ones for the diagnosis and monitoring of treated hypertensive patients. This is how we conducted this study which aims to assess the contribution of ambulatory blood pressure measurement (ABPM) in our practice.

Materials and methods: This was a descriptive cross-sectional study carried out at the cardiology department of the Aristide Le Dantec teaching hospital over a period of twelve (12) months (January 1, to December 31, 2018).

Results: We collected 122 patients during the study period, with a female predominance (M / F sex ratio = 0.69). The average age of the population was 53.22 ± 13.19 years.

The indication for ABPM was a therapeutic evaluation in 81 patients (66.40%), with a diagnostic aim of hypertension for 41 patients (33.60%) including 5 cases of Pregnancy-induced hypertension. ABPMs were normal in 30% of cases. The nycthemeral average was 140 ± 18.66 for systolic blood pressure and 84.02 ± 14.56 for diastolic blood pressure. Among the abnormal measures, we noted 45.90% of dipper subjects, and 41% of non-dippers. In the therapeutic evaluation, hypertension was controlled in 22 patients (27.2%) and uncontrolled in 59 cases (72.80%). In the diagnostic indication, hypertension was confirmed in 23 cases (63.9%) and a white coat hypertension was found in 13 cases (36.1%). Pregnancy-induced hypertension was confirmed in 3 out of 5 patients (60%).

Conclusion: This study showed the importance of ABPM as a diagnostic and therapeutic evaluation tool. Its rational use in our context would improve the care of hypertensive patients and thus prevent damage to target organs.

Keywords: Hypertension; ABPM; blood pressure control

Introduction

Hypertension is a common chronic disease representing a major public health problem. In 2000, it reached one out of four adults worldwide, ie a rate of 26.5%, with an evolution in prevalence

which should reach 29% in 2025 [1]. In Africa, more than 40% of the adult population is affected, and this prevalence varies according to the country [2]. In Senegal, it affects one out of three Senegalese, ie

3 million Senegalese [3], with an estimated prevalence of 29% in people aged 18 to 69 years [4]. However, despite the seriousness of hypertension, correct treatment and good control of blood pressure figures significantly reduce the risk of cardiovascular complications. Compared to the blood pressure measurement at the medical office, the ambulatory blood pressure measurement for 24 hours reflects more accurately the patient's blood pressure to which he is subjected in his real life conditions [5]. This examination is more correlated with the evaluation of the cardiovascular risk and the damage to the target organs than the clinical measurement and makes it possible to find certain phenomena such as hypertension called "white coat", masked hypertension or anomalies of the circadian rhythm of blood pressure (BP). We therefore carried out a study, whose aim was to assess the contribution of ABPM in the diagnosis and evaluation of the level of control of hypertension, in the cardiology department of Aristide le Dantec Hospital.

Patients and Methods

We carried out a cross-sectional, descriptive study with data collection carried out over 12 months (January 1 to December 31, 2018) in the cardiology department of Aristide Le Dantec Hospital in Dakar. This study included all patients who benefited from an ABPM in the department, in the context of suspected hypertension or a therapeutic evaluation, and who consented to participate in the study. Invalid ABPMs (lasting less than 24 hours or less than 50 good measurements) were not included. The ABPMs were performed using a Meditech ABPM-05 brand device. Data collection and processing was carried out using HM5 software. Concerning the interpretation of the ABPM results, the reference values used are those of the meta-analysis by Staessen [6]:

- A BP of more than 135/85 mmHg was considered as the limen for confirming the diagnosis of hypertension, for the daytime averages.
- Hypertension was considered to be controlled for a BP <130/80 mm Hg over the entire 24-hour average.

We studied the type of systolic, diastolic or systolo-diastolic hypertension. We analyzed the nycthemeral profile for: diurnal, nocturnal or both. Finally, we looked for the existence of a night dip. Were classically defined as 'non-dippers', patients who did not show a decrease in day and night blood pressure of at least 10/5 mmHg or at least 10% [7]. In contrast, subjects with nighttime BP drop values greater than 20% can be considered « extreme dippers » [8].

Patients were said to be "dippers" when their nocturnal BP decreased by 10 to 20%. A lowering of more than 20% defined extreme dipper patients. Non-dipper patients had a decrease of less than 10% in their nocturnal systolic blood pressure. The dipper reversals had their nocturnal blood pressure figures higher than the daily figures. Pulse pressure was defined as the difference between systolic BP and diastolic BP [9]. In our study, we considered as high a pulsed pressure (PP) ≥ 60 mmHg [9-11]: A white coat hypertension is defined by the presence of an hypertension during the consultation at the clinic that showed normal on the 24h

ambulatory measurement [8]. Masked hypertension is defined by the presence of normal blood pressure figures in the clinic and a high BP in ambulatory care. It is the opposite phenomenon of the white coat HT. Resistant hypertension or refractory hypertension is defined as persistent hypertension despite optimal anti-hypertensive triple therapy including a diuretic [8]. The data collected were entered using a questionnaire developed by Sphinx plus 5 software.

Results

A total of 122 patients were recruited during the study period. The average age of the population was 53.22 ± 13.19 years with extremes of 25 and 85 years. The female sex predominated with a sex ratio M / F of 0.69. The majority of the population had hypertension ranging from 1 year to 10 years. In our study, 81 patients were taking antihypertensive therapy, the majority of them on dual therapy (58%). Physical inactivity (59.80%), menopause (68%) and diabetes (36.88%) were the most common risk factors (Table 1).

Table 1: General characteristics of the studied patients.

Characteristics	Effectif	Percentage (%)
Sex ratio Men/Women	0.69	-
Median age	53,22 \pm 13,19 (25 à 85 ans)	-
Risk factors :		
Physical inactivity	73 (n=122)	59,80
Diabetes	45 (n=122)	36,90
Menopause	49 (n=72)	68,05
Contraception	15 (n=72)	20
Tobacco	31 (n=122)	60,2
Obesity	21 (n=117)	32,8
Duration of hypertension:		
Less than 1 year	40 (n=110)	36,30
1-10 years	47 (n=110)	42,50
10-20 years	18 (n=110)	16,80
Greater than 20 years	5 (n=5)	4,40
Therapeutic protocol :		
Monotherapy	20 (n=81)	24,70
Bitherapy	47 (n=81)	58
Tritherapy	14 (n=81)	17,30

In the diagnostic indication for high blood pressure, ABPM was normal in 36.1% of cases. We found 13 profiles simulating a white coat HT, ie a rate of 36.1%. Among them were nine female patients. ABPM was requested in 66.4% of cases for a therapeutic evaluation (Table 2). In the context of this therapeutic evaluation, 27.2% of the patients were well controlled. Resistant hypertension was found in 7.37% of cases.

Table 2: Distribution of patients according to ABPM results.

Parameters	Effectif	Percentage (%)
Indication		
Diagnostic evaluation	41	33,60
Therapeutic evaluation	81	66,40
Nychtemeral profile		
SP	140 ±18,66 mmHg	-
DP	84,02 ± 15,56 mmHg	-
Average daytime		
SP	143,06±19,12 mmHg	
DP	87,52±15,25 mm Hg	
Average nighttime		
SP	134,80±19,53mmHg	
DP	79,12±13,76mmHg	
Type of hypertension		
Systolic	26(n=85)	30,6
Diastolic	4(n=85)	4,7
Systolic and diastolic	55(n=85)	64,7
Dipping		
Dipper	56(n=122)	45,9
No dipper	50(n=122)	41
Extrem dipper	7(n=122)	5,7
Reverse dipper	9(n=122)	7,4
Abnormal pulse pressure	25(n=121)	20,76

SP : systolic pressure DP : diastolic pressure

Discussion

The average age of our patients was 53.22 ± 13.19 years. This result is higher than that found in the department in a study which found an average age of 49.6 ± 11.5 years [12]. There is a female predominance (59%); similar results had been previously reported [12]. Analysis of the ABPM indications shows that it is mainly prescribed in the cardiology department of the Aristide Le Dantec Hospital to evaluate antihypertensive therapy (66.48%). Of the 81 ABPMs, only 22 hypertensive patients were controlled, a rate of 27.20%. This rate is far from satisfactory in comparison with the reported level of control from Brazzaville [13] estimated at 35%. Our low control rate could be explained by the fact that only patients not controlled in the office had the prescription for ABPM. The control rate based on clinical measures in 1995 in Dakar was 32% [14]. In sub-Saharan Africa, the low levels of hypertension control are alarming [15]. Worldwide, good control of hypertension remains a real problem.

In our study, the diagnostic indication ranked second at 33.6%. This has been observed in most studies, except in Ivory Coast [16]. where the indication for diagnosis of hypertension was in first place with a percentage of 81.4%, and the indication for therapeutic

evaluation came in second place with a rate of 4.3%. Of the 41 patients referred for a diagnostic review of hypertension, HT was confirmed in 70.8% of cases. The ESH / ESC 2018 working group recommends that the diagnosis of hypertension be based on an ambulatory blood pressure measurement (Holter blood pressure) and /or on self-measurements, provided that they are logistically and economically feasible [17]. According to a study [18]. on ABPM in the diagnosis of hypertension: neither the clinical measurements, nor the home measurements had sufficient sensitivity or specificity to be recommended as a single diagnostic test.

The white coat hypertension was observed in 13 patients (36.1%). In Brazzaville, 25% of patients with suspected hypertension had a normal blood pressure profile [13]. These results are consistent with data from the 2013 ESH / ESC recommendations [19], which indicate an average prevalence of white coat hypertension between 13 and 32%.

The prognosis for patients having a white coat HT is a topic of discussion. Ugajin and Co [20]. demonstrated, over an 8-year follow-up, that patients with white coat hypertension became hypertensive in 47% of cases, compared to 22% of patients initially normotensive (p <0.001).

In this work, the proportion of non-dipping subjects on the whole population was estimated at 54.10%. The extreme dippers patients were 5.70%. Indeed, Kario and Co have shown that these "extreme dippers" patients have advanced silent brain damage detected by MRI [13], and the JMS-ABPM study wave 1 also showed that elderly hypertensive patients and "extreme dippers" presented more cerebrovascular events [21]. In addition to the diagnostic and therapeutic evaluation role, ABPM also allows a prognostic evaluation. The pejorative nature of hypertension is reflected by the level of pulsed pressure which is well correlated with cardiovascular morbidity and mortality.

In our series, the rate of pulse pressure (PP) greater than or equal to 60 mmHg was 20.70% (n = 25). Madhavan and Co have shown that the PP alone, not diastolic and systolic BP, is a predictor of myocardial infarction [11, 22].

Accumulated data suggest that monitoring ambulatory blood pressure is a better prognostic marker than clinically obtained blood pressure. Outpatient blood pressure monitoring can detect white coat hypertension and masked hypertension, which reduces the risk of misclassification of blood pressure [23-26]. The main limitation of the study was the accessibility of the device. In fact, we had at our disposal only one ABPM device in the cardiology department. This explains the relatively small sample size.

Conclusion

ABPM is an important and very useful tool that should occupy a privileged place in diagnosis and therapeutic evaluation. Its rational use in our context should allow the improvement of the management of hypertensive patients and facilitate the prevention of HT complications.

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