



Hypertension and Rate Control in Oujda (Morocco): Place of Ambulatory Blood Pressure Monitoring (ABPM): Which Risk Factors?

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ABSTRACT

To evaluate the rate control of the hypertensive patients and to identify the risk factors of non-control in the eastern region of Morocco. Our study is an analytical cross-sectional study covering a period of 34 months, between January 2014 and September 2016. The study consisted of 301 hypertensive patients known and treated for at least 4 weeks, having profited from an ambulatory blood pressure monitoring (ABPM) with therapeutic aiming, collected from the non-invasive cardiology department of the Mohammed VI university hospital of Oujda. We used the BTL-08 ABPM, NBP-24 NG NORAV for the recording and the software SPSS for the data analysis. The threshold was fixed on the average of 24-hours was BP < 130/80 mmHg, and the patients were divided into two groups according to whether they were or not under control. There were 161 men (39%) and 185 women (61%), with an average age of 60 years (ranges: 23 to 91 years). Age was the most common cardiovascular risk factor 57%, followed by diabetes in 29%, obesity in 27%, dyslipidemia in 20%, then smoking in 16%. Note that all women in our population were menopausal. 42.5% of our subjects were under single medication, 45.2% were under double medication and 12.3% were under triple medication. Non-therapeutic control was objectified in 49% of our patients. The prevalence of non-dipping was 45.8%. Advanced age and monotherapy were the risk factors of non-control. half of hypertensive patients in our study were not adequately controlled under antihypertensive therapy. This work emphasizes the contribution of ABPM in the evaluation of blood pressure control. Factors of poor control were advanced age and monotherapy.

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INTRODUCTION

High blood pressure is a global public health issue [1]. Early diagnosis and good control are the first steps to reduce and control the risk of cardiovascular events associated to this silent killer [2]. According to epidemiological and clinical studies, ABPM is essential in the therapeutic evaluation and can predict cardiovascular events in hypertensive subjects, including myocardial infarction, sudden death, stroke... [3-6].

The benefit of antihypertensive treatment is correlated to the decline in blood pressure figures, and this is the subject of several recommendations of learned societies [7, 8] Despite these measures, attaining a good blood pressure control is not at all ease in practice and is variable depending on the country.

In order to improve the management of hypertensive patients in the eastern region of MOROCCO, the present work aims to assess the level of blood pressure control in treated hypertensive patients and to define the risk factors related to poor blood pressure control.

MATERIAL AND METHODS

1. Patients and methods

This is a cross-sectional, retrospective, analytical data collection study conducted at the non-invasive cardiac tests department of the Mohammed VI university hospital of Oujda, between January 2014 and September 2016 (34 months).

The study consisted of 301 hypertensive patients who had been treated regularly for at least 4 weeks, and who received an ambulatory blood pressure monitoring (ABPM) with therapeutic aiming.

Two devices were used for the recordings in our study: BTL-08 ABPM, NBP-24 NG NORAV. Data were analyzed by the software SPSS. Setting the threshold of the daytime hypertension at 135/85 mmHg, nocturnal at 120/70 mmHg, and overall at 130/80 mmHg.

Several variables were studied: socio-demographic (age, sex), cardiovascular risk factors (menopause, diabetes, obesity/abdominal obesity, dyslipidemia, smoking, heredity of cardiovascular disease), antecedents (history of coronary artery disease, obliterative arterial disease of the lower limbs, stroke) average blood pressure (of 24 hours, daytime and nocturnal), the antihypertensive protocol and drug class used.

Data was processed and analyzed with software SPSS 20. To compare, we used the Chi2 test for qualitative variables, and variance analysis (Anova) for quantitative variables. We used a logistic regression to identify the risk factors of non-control. The threshold of significance was set at $p < 0.05$

RESULTS

There were 161 men (39%) and 185 women (61%), with an average age of 60 years (ranges: 23 and 91 years)

Age was the most common cardiovascular risk factor 57%, followed by diabetes in 29%, obesity in 27%, dyslipidemia in 20%, then smoking in 16%. Note that all women in our population were menopausal.

Fourteen percent of patients had a history of coronary artery disease, 4 % had obliterated arterial disease of the lower limbs and 2 % had a history of stroke. Table 1 summarizes the main characteristics of the study population

Table 1. Main characteristics of our population.

Patients : 301	
Women	185 (61%)
Average age (years)	60
Diabetes	29%
Obesity	27%
Dyslipidemia	20%
Smoking	16%
coronary artery disease	14%
obliterative arterial disease of the lower limbs	4%
Stroke	2%
Controlled high blood pressure	153 (51%)
Bitherapy	128 (42.5%)
non-dipping status	138 (45.8%)

In our study, ABPM had revealed poor blood pressure control in 49% of our patients, especially systolo-diastolic type. The antihypertensive protocol used was a monotherapy in 128 cases (42.5%), bitherapy in 136 cases (45.2%) dominated by the combination: inhibitor of the conversion enzyme + calcium antagonist, tritherapy in 37 cases (12.3%) dominated by the association: angiotensin-II receptor antagonists + calcium antagonist + diuretics.

The risk factors of non-control highlighted in our study were advanced age and monotherapy.

DISCUSSION

High blood pressure is a global public health issue, because of its high frequency, the need for long-term drug treatment, and its cardiovascular complications. Several epidemiological studies have shown that high blood pressure is very often poorly controlled. Thus, the frequency of known and treated hypertensive subjects with controlled hypertension (assessed on a clinical measurement of BP <140/90 mmHg) varies from 19.9% in China [9], to 28.7% in Portugal [10], 32.2% in Greece [11], 53.1% in the United States [12] and 72.4% in Canada [13], and few studies have been reported in our country.

Table 2. Risk factors of non-control.

Explanatory variables		Uncontrolled high blood pressure		OR (IC à 95 %)	P
		YES	NO		
Age (middle)		60 ans			
Age (as cardiovascular risk factor)		54.6 % (106)	42.1 % (45)	1.056 (1.019 – 1.95)	0.003
SEX :	Male	53.8 % (63)	46.2 % 54	0.385 (0.12 – 12.858)	0.594
	Female	47.8 % 88	52.2 % 96		
Diabetes	YES	57 % (53)	43 % (40)	1.143 (0.285- 4.590)	3.998
	NO	47.1 % (48)	52.9 % (110)		
Obesity	YES	53.5 % (46)	46.5 % (50)	0.945 (0 .487-1.836)	0.868
	NO	48.8 % (105)	52.1 % (110)		
Dyslipidemia	YES	43.1 % (28)	56.9 % (37)	0.750 (0.339 – 1.661)	0.479
	NO	52.1 % (123)	47.9 % (113)		
Smoking	YES	53.8 % (28)	46.2 % 26	1.195 (0.656 – 2.176)	0.560
	NO	49.4 % (123)	50.6 % (126)		
history of coronary artery disease	YES	50 % (25)	50 % (25)	0.565 (0.137 – 3.137)	0.598
	NO	50.2 % (126)	48.8 % (125)		
obliterative arterial disease of the lower limbs	YES	40 % (6)	60 % (9)	0.858 (0.170 – 8.467)	0.856
	NO	50.7 % (145)	49.3 % (141)		
Stroke	YES	42.9 % (3)	57.1 % (4)	2.449 (0.208-28.849)	0.477
	NO	50.3 % (148)	49.7 % (146)		
Menopause	YES	51.5 % (85)	48.5 % (80)	1.179 (0.294-4.738)	0.816
	NO	23.5 % (4)	76.5 % (13)		
Monotherapy		42.5 %		0.285 (0.094-0.864)	0.027
combination therapy		54.8 %		0.311 (0.095-1.025)	0.311

In fact, although the clinical evaluation of AP in hypertensive patients at the medical office is the basis of the recommendations of the French Society of Hypertension [14], it is insufficient and may lead to an inefficient and even harmful therapeutic escalation [14, 15]. ABPM thus appears to be a useful and effective means for the evaluation of blood pressure control in hypertensive patients. In fact, it allows to obtain a large number of measurements, to determine the variations of BP during the nycthemeron and eliminate the "white coat" effect [14-17], in this sense, several studies have highlighted the superiority and reliability of the ABPM compared to the measurement in the office in terms of blood pressure control, masked hypertension, white coat hypertension and white coat effect [18].

Controlling blood pressure figures and reducing overall cardiovascular risk are cardinal goals in the treatment of hypertensive patients [7, 8]. In our study, the proportion of uncontrolled hypertension was 49%, which is not far from the result found in a cross-sectional study in Burkinabe about 456 hypertensive patients (54.2%) [19]. The Perret-Guillaume et al. study about patients who were at least 60 years old, found 50% uncontrolled hypertensive subjects [20], while in the Vitaraa study in South Kivu (Congo) the proportion of uncontrolled hypertension was 85.9% [19].

According to McLean, poor blood pressure control is due to the lack of regular monitoring. In fact, he demonstrated that regular follow-up of BP at home by a specialized nurse improved blood pressure control and was cost-effective [21]. Thus, a regular measurement of BP with therapeutic adjustment is necessary to obtain a good blood pressure control, which can explain the relatively high rate of hypertensive patient controlled (51%) found in our study, since the recruitment of the majority of patients is done through the consultation where a follow-up of the patients and an adjustment of the treatment are done regularly.

The determination of the imbalance factors of high blood pressure is important in order to improve its control. Our study showed that the unbalanced subjects were older, and were under a single antihypertensive medication (Table 2). According to African studies reported, several factors were identified as predictors of poor blood pressure control such as advanced age and monotherapy [22,25]. Because of this, good blood pressure control requires optimized treatment, and the important thing is to reach the therapeutic goal, regardless of the number of molecules used.

According to the ALLHAT study [26], 63% of patients were under two or more antihypertensive medication, compared to 54.8% in our study, while 45.2% of our patients were under monotherapy. Recent international recommendations clearly show that in the majority of hypertensive patients, monotherapy would not be sufficient and that bitherapy or more would be necessary [7, 8]

CONCLUSION

High blood pressure is a global public health issue, its management encounters enormous difficulties leading to a poor control of the blood pressure figures. The contribution of ABPM is essential to evaluate blood pressure control in hypertensive patients treated and it should be used in common practice

Half of our patients were uncontrolled and the main factors of poor BP control were advanced age and monotherapy

Conflict of interest

The authors declare that there are no conflict of interest

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