

## **Epidemiological, Clinical and Therapeutic Characteristics of Arterial Hypertension in the Elderly in A Moroccan Population**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

The aim of the study is to report the epidemiological, clinical and therapeutic aspects of arterial hypertension in the elderly in Moroccan hospitals. This was a descriptive retrospective study conducted over a period of 2 years in the cardiology department of the CHU Ibn Rochd. It concerned subjects aged 60 and over, know hypertensives, followed in the department during the study period. We retained 134 patients, i.e. 59.29% of the 226 hypertensive patients followed during this period: 107 women (79.85%) and 27 men (20.15%), with an average age of 68,31 ± 13.5 years in the both sexes (extremes: 60 to 87 years). Systolic hypertension was the most frequently reported. Median blood pressure was 14.39 mmHg systolic and 77.84 mmHg diastolic. Diabetes was the most common risk factor associated with high blood pressure with a frequency of 39,76%. The symptom most reported by patients was dyspnea on exertion (14.18%). Left ventricular hypertrophy was present in 8.21% of cases. In 63.43% of cases, the objective blood pressure goal was reached. Bitherapy with 49.18% was the most used therapeutic choice. The most prescribed therapeutic classes were ACE inhibitors and calcium channel blockers. This study highlighted a high prevalence of arterial hypertension in the elderly at the CHU Ibn Rochd in Casablanca. Despite well codified treatment, hypertension in the elderly remains insufficiently controlled so far.

*Keywords: Hypertension; elderly; Moroccan population.*

## 1. INTRODUCTION

Arterial hypertension (HTA) is a major public health problem in developing countries. It would affect 10 to 15% of the adult population in the Maghreb [1,2]. The prevalence of hypertension is constantly increasing in the elderly [3], in whom it represents the main factor of cardiovascular morbidity and mortality. In Morocco, the epidemiological characteristics of arterial hypertension in the elderly remain insufficiently informed. We conducted a retrospective study in a hospital setting, at the CHU IBN ROCHD (Casablanca), with the aim of determining the epidemiological aspects in elderly hypertensives. Work carried out in parallel on the same sample made it possible to study the clinical and therapeutic particularities of this population of elderly hypertensives [4].

## 2. METHODS

**Type and period of study:** This was a descriptive retrospective study, by documentary review, carried out in the cardiology department of the CHU Ibn Rochd in Casablanca. It took place over a period of 2 years.

**Study Population:** This study was part of a regular annual outpatient follow-up of hypertensive patients, in the Cardiology department of the CHU Ibn Rochd in Casablanca. It is a reference center for the management of cardiovascular pathologies, at the local level.

**Inclusions Criteria:** All known hypertensive subjects, aged at least 60 years old, followed in the cardiology department, and consenting, were included in the study.

**Collection Tools and Variables of the Study:** The data collection had consisted of an exploitation of the files of the patients. The data was collected using a data collection sheet which included all the variables on hypertension. Sociodemographic data (age, sex, occupation, level of education), cardiovascular risk factors (diabetes, dyslipidemia, smoking, physical inactivity, alcohol consumption, etc.), initial symptoms, cardiovascular examination data, the electrocardiogram data and the echocardiographic data, and finally the therapeutic data were collected..

**Sampling:** All patients who presented during the study period and who met the inclusion criteria were selected.

**Operational Definitions:** 1) Hypertensive: all patients were hypertensive who had a systolic blood pressure (SBP)  $\geq 140$  mmHg and/or a diastolic blood pressure (DBP)  $\geq 90$  mmHg or when they had antihypertensive treatment regardless of the regularity of the treatment. 2) The elderly person was a person whose age was  $\geq 60$  years according to the WHO [3]. 3) The hypertension grades were those defined in the 2018 ESC recommendations. 4) The blood pressure control corresponded to a BP  $< 140$  mmHg under treatment.

**Data entry and statistical analysis:** A simple descriptive analysis was performed on the entire study population. The results are expressed in frequency for the qualitative variables or in mean  $\pm$  standard deviation for the quantitative variables. The estimation of the prevalence of hypertension and of the average results in the population was made by adjusting the data for sex, with a statistical confidence level of 5%. Pearson's chi-square test and Fisher's exact test were used for comparison of percentages. Statistical significance was reached when  $p < 0.05$ .

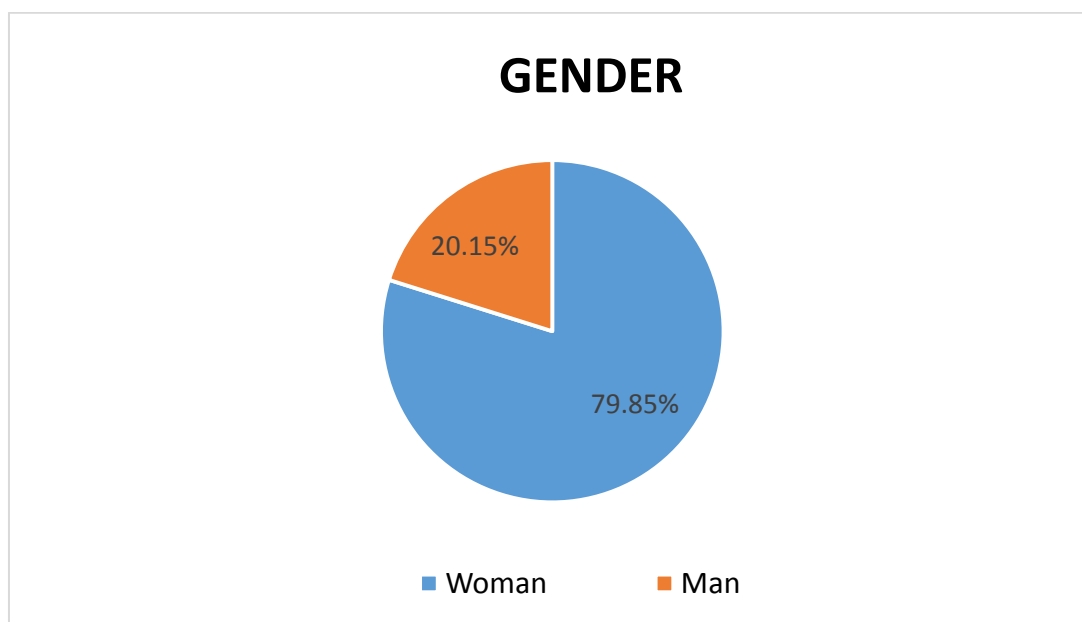
## 3. RESULTS

### 3.1 Sociodemographic Characteristics

A total of 226 people were followed for hypertension during the study period; 134 met the inclusion criteria, i.e. 59.29% of cases. Our study population was predominantly female with 181 women and 45 men, respectively 80.09% and 19.91% and a sex ratio of 0.25. The median age of our study population was 61.13 years (range 60 and 87 years). The majority of patients were uneducated. 26 patients (11.50%) in our study still had a professional activity.

### 3.2 Prevalence of Hypertension and Clinical and Therapeutic Characteristics

Median systolic blood pressure was 143.39 mmHg and diastolic blood pressure was 77.84 mmHg. In our study population, 134 elderly patients were hypertensive, i.e. an overall prevalence of arterial hypertension in the



**Fig. 1. Distribution of elderly hypertensive patients by gender**

**Table 1. Distribution of elderly patients according to hypertension grade**

Grade de l'HTA	Number (n)	Percentage (%)
Grade 1	100	74.63
Grade 2	20	14.92
Grade 3	14	10.45
Systolic hypertension	71	52.99

BP : blood pressure

**Table 2. Distribution of elderly patients according to the duration of hypertension**

	Number (n)	Percentage (%)
Less than 5 years	22	26.51
5-10 years	28	33.73
More than 10 years	33	39.76

elderly subject of 59.29%. 79.85% of the population were women (107 patients) while 20.15% were men (27 patients), with a sex ratio of 3.96. The median age of the patients was  $68.31 \pm 13.5$  years (extreme 60 and 87 years). Systolic hypertension was the most frequent reported. The classification of hypertension according to the different grades is reported in Table 1. The seniority of the hypertension was specified in 83 patients (61.94%). It was for 22 (26.51%), 28 (33.73%), 33 (39.76%) patients respectively under 5 years old, 5 to 10 years old and over 10 years old (Table 2). Diabetes was the risk factor most frequently associated with hypertension (53 patients or 39.55%). The other risk factors were dyslipidemia (49 patients or 36.57%), smoking (4 patients or 2.98%), renal failure (4 patients or 2.98%).

No patient reported consuming alcohol. The most frequently reported symptom was exertional dyspnoea (19 patients or 14.18%). Left ventricular hypertrophy was present in 11 patients (8.21%). 7 patients (5.22%) were at the stage of hypertensive heart disease. 85 patients (63.43%) reached the blood pressure goals, in 49 patients (36.57%) hypertension was insufficiently treated. Antihypertensive treatment was provided in 122 patients (91.04%). 31 patients (25.41%) were on monotherapy, dual therapy was prescribed in 60 patients (49.18%). The use of triple therapy was made in 21 patients (17.21%), and quadruple therapy in 10 patients (8.20%). ACE inhibitors and calcium channel blockers were mainly prescribed, in 39.34% and 37.70% of cases respectively. The other therapeutic classes were made up of: diuretics

(20 patients, i.e. 16.39%), and angiotensin II receptor antagonists (17 patients, i.e. 13.93%). Beta blockers were prescribed in 24 patients (19.67%).

#### 4. DISCUSSION

During the study period, we collected 134 hypertensive patients aged 60 and over among 226 hypertensives, followed in the cardiology department, i.e. a prevalence of 59.29%. Hypertension remains a major public health problem in the elderly. This high prevalence is also reported in several African studies. Indeed, Tougouma in Burkina Faso [5] and Damorou in Togo [6] respectively reported prevalences of 61.36% and 74.29% in the elderly population. This high prevalence, associated with other cardiovascular risk factors, increases the overall cardiovascular risk in this subpopulation [7].

During this study, we observed a female predominance 107 patients (79.85%), 27 men (20.15%) with a sex ratio of 3.96. This result was observed by Martioni [8] who found a female/male ratio of 2.64. This seems more consistent with African demography characterized by a higher life expectancy among women.

Hypertension in the elderly is often described as pure systolic [9]. Our result reflects well the data of the literature, and those of certain studies [10,11]. However, in all these studies, it appeared that it was above all systolic hypertension that was the least well controlled, particularly in the elderly.

We noted 10.45% of grade 3 hypertension, showing the severity of this condition in the Moroccan population. Our result is similar to that of Ba in Mauritania [12], in whom the frequency of grade 3 hypertension was 20.8%.

Diabetes was the most frequently associated risk factor (53 patients or 39.55%). Diabetes is a frequent pathology in the elderly, with a prevalence reaching 10 to 20% after 65 years [13]. These two pathologies, associated in 80% of cases in the elderly, contribute to the increase in cardiovascular risk [14].

Left ventricular hypertrophy (LVH) was found in 8.21% of patients. LVH is a cardiovascular risk factor in its own right. In Levy's work, conducted in 3220 subjects included in the Framingham study, with a four-year follow-up, the presence of

LVH detected by ultrasound had increased the risk of cardiovascular disease in both sexes by two, and the risk of death from cardiovascular origin, five times in men and three times in women[15].

Only 25 to 30% of hypertensive patients worldwide are well controlled by their antihypertensive treatment [16]. In our study, the blood pressure goal was reached in 63.43% of patients. This result reflects the strategy of the Moroccan national program for the prevention and fight against cardiovascular diseases, based on the improvement of medical care, through the revision and updating of the hypertension management reference system. As well as the improvement of its screening among groups at risk.

The synergistic combination of ACE inhibitor and calcium channel blocker was predominant. This could be expressed by the accessibility of these products and their lower costs on the one hand, and on the other hand, by their effectiveness demonstrated by the recommendations of the learned society and other studies [17,18].

#### 5. CONCLUSION

Hypertension remains a real public health problem today. Its prevalence is high in the elderly. Systolic hypertension was the most frequent. Despite well codified treatment, hypertension in the elderly remains insufficiently controlled so far. However, the strategy developed by the Moroccan program for the prevention and fight against cardiovascular diseases, seems to bear fruit in the therapeutic observance and blood pressure balance of patients.

#### ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

#### CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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