

# EPIDEMIOLOGICAL ASPECT AND ASSOCIATION OF HYPERTENSION AND DIABETES IN A MOROCCAN POPULATION OF HYPERTENDS

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## ABSTRACT:

High blood pressure (HBP) and diabetes are frequently associated cardiovascular risk factors. The objective of our study is to estimate the prevalence of diabetes in a hypertensive's population followed in the cardiology department, Ibn Rochd University Hospital in Casablanca, and to study the relationship between hypertension and diabetes as well as their clinical and epidemiological aspects. During the study period, we were able to identify 87 diabetic patients among 227 hypertensives, followed in the cardiology department, i.e. a prevalence of 38.32%. Our study showed the frequent association of these two pathologies and more particularly in female patients, and that this association increases with age. The average age onset was 61.46 years.

Keywords: High blood pressure, Diabetes

## INTRODUCTION:

HBP represents a major public health problem in developing countries, it affects more than 2 billion people, or one in three adults in the world (1). Its association with diabetes is common, reducing the prevalence of hypertension in this subpopulation (2, 3, 4) which makes the management of hypertension more difficult (5), potentiating cardiovascular morbidity and mortality rate. We conducted a retrospective study in the department of cardiology at the Ibn Rochd University Hospital in Casablanca with the aim of determining the prevalence of diabetes in hypertensives Moroccan population.

## PATIENTS AND METHODS:

This was a descriptive retrospective

study, by documentary review, carried out over a period of 2 years as part of a regular annual follow-up of hypertensive patients, including 227 patients, followed in the cardiology department of the Ibn Rochd University Hospital from Casablanca.

Data collection consisted of analyzing patient files, and the data was collected using a data collection sheet which included all the variables on hypertension.

The variables studied are: age, sex, diabetes, tobacco, hypertension, dyslipidemia, renal failure, alcohol consumption and obesity.

BP was taken with a validated automatic electronic self-measurement device, after resting for a few minutes,

in a sitting or lying position.

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

**Operational definitions:-HBP:**

Determination of blood pressure was carried out in accordance with WHO recommendations (Table 1) [6].

Arterial hypertension was defined as the presence of either antihypertensive treatment or a BP greater than or equal to 140/90 mmHg.

**-HBP grades are defined in accordance with the 2018 ESC guideline.**

The definition of diabetes matches that of the American Diabetes Association (ADA) (7).

**Obesity is defined as a body mass index (BMI)  $\geq 30$  kg/m<sup>2</sup> (8).**

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

**RESULTS:**

A total of 227 patients were followed for HBP during the study period, our population was predominantly female with 182 women and 45 men,

respectively 80.17% and 19.82% and a sex ratio of 4.04. The median age of our study population was 61.12 years (range 34 to 87 years).

The majority of patients had no formal education. 26 patients (11.50%) in our study still had a professional activity.

Systolic HBP was the most frequently reported with a median of 142.03 mmHg versus 77.43 mmHg for diastolic blood pressure.

Family history of HBP, diabetes and dyslipidemia were found in our study population with the following percentages; 62.55%, 52.42%, 21.02% respectively. Exertional dyspnea was the most common symptom, it was found in 25 patients or 11.01%, 23 patients (10.13%) had left ventricular hypertrophy, and 7 patients (3.08%) were at the stage of hypertensive heart disease.

Of the 227 hypertensive patients included in our study, 87 were diabetic (38.32%), with a prevalence of 40.65% of women, versus 28.88% of men, the average age of diabetics was 61, 46 years.

62.06% (i.e. 54 patients) were aged between 45 and 65 years, 33.33% (i.e. 29 patients) over 65 years old, and 4.59% (i.e. 4 patients) under 45 years old (table 2 ).

Mean systolic blood pressure (SBP) was elevated in diabetics patients ( $162 \pm 56$  mm Hg) compared to non-diabetics' patients ( $141.5 \pm 43.5$  mm Hg). Unlike diastolic blood pressure (DBP) where we did not note a significant difference ( $85.5 \pm 19.5$  vs  $85 \pm 17$  mm Hg).

Obesity was present in 43.67% (38 patients) of diabetic hypertensive patients, compared to 37.14% (52 patients) of non-diabetic hypertensives patients. 47.12% (40 patients) of diabetic hypertensives patients had dyslipidemia versus 30% (42 patients) of non-diabetic hypertensives ones. We also found renal insufficiency in 6.89% (6 patients) among the population of diabetic hypertensives patients while it was present in 5% (7 patients) of non-diabetic hypertensives ones.

## DISCUSSION:

Over the two years period, i.e. the entire period of our study, we were able to collect 87 diabetic hypertensive patients among 227 hypertensives, followed in the cardiology department, i.e. a prevalence of 38.32%. This high prevalence is also reported in several studies around the world (9, 10). Our study had shown the frequent association of these two pathologies and more particularly in female patients (11). This association also increases with age, with an average age onset of 61.46 years (12).

Obesity was associated with these two pathologies in 43.67%. The association of hypertension, diabetes and obesity is well documented in the literature (13).

These two pathologies represent a

major public health problem worldwide, due to their frequency, the need for lifelong monitoring and drug treatment, and their serious cardiovascular complications.

Better blood pressure and diabetic control can considerably reduce the risks of cardiovascular complications and mortality in hypertensive and diabetic patients (14),

These results obtained by our study are part of the general framework of the conclusions of studies on the high prevalence of diabetes in hypertensive patients and vice versa whether in Morocco (15) or in the world (16).

## CONCLUSION:

HBP and diabetes are frequently associated, particularly in women and elderly people. This association considerably potentiates the cardiovascular risk which emphasizes the importance and the necessity of researching one to discover the other. It also allows early treatment and therefore avoids or delays the arrival of complications.

## Consent

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

Table 1 classification of hypertension according to the WHO

category	PAS (mmHg)	PAD (mmHg)
optimal	<120	and <80
Normal	120-129	and /or 80-84
normal high	130-139	and /or 85-89
HTA grade I	140-159	and /or 90-99
HTA grade II	160-179	and /or 100-109
HTA grade III	≥180	and /or ≥110
Isolatedsystolic hypertension	≥ 140	and <90

Table 2: Distribution of diabetic patients according to age groups in our population

Age	Number of patients	Percentage %
> de 65 years	29	33,33
45-65 years	54	62,06
<45years	4	4,59

**Figure 1: Distribution of diabetics patients by gender**



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