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Cardiology

Distribution of Cardiovascular Risk Factors among Operated Coronary Patients in Morocco - About 1009 Cases

El Boussaadani Badre, MD[1*], Qat Amine[1], Benajiba Chakib[1], Rais Zakaria[1], Oukeraj Latifa[1], Mermade Lahcen[2]

[1]Department of Cardiology B, Ibn Sina University Hospital, Rabat, Morocco
[2]Department of Cardiovascular Surgery B, Ibn Sina University Hospital, Rabat, Morocco

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***Corresponding author:** Dr. El Boussaadani Badre

Abstract **Original Research Article**

Position of the problem: The increasing incidence of atherosclerotic coronary artery disease in Morocco represents a real public health problem and generates an immense challenge to reduce cardiovascular morbidity and mortality. ***Primary Objective:*** Establish the prevalence of cardiovascular risk factors among operated coronary patients in order to allow an analysis of the field exposed to a high cardiovascular risk. ***Patients and Methods:*** We carried out a retrospective study on a series of 1009 cases of the operated coronary patients at Cardiovascular Surgery Service "B" at Ibn Sina Hospital in Rabat from 2001 to 2016. ***Results:*** Our sample consists of 793 men and 216 women, whose mean age was 60, 99 ± 8,4. The prevalence of HTA: 52 %; diabetes: 51,8 %; smoking : 49% ; dyslipidemia: 25% ; abdominal obesity : 6 %; metabolic syndrome according to the NCEP ATP III criteria : 5 % ; stress: 1%; depression: 0,4%; heredity: 4%. The results are presented and discussed. The ejection fraction, coronary angiography results and coronary artery bypass grafting are studied. Furthermore, many associations have been established and discussed. ***Conclusion:*** The growing incidence of coronary artery disease in our country has prompted us to develop this work, which had a high prevalence of hypertension, diabetes and smoking. This situation requires the implementation of a strategy for reduction and the control of cardiovascular risk factors, and efficient and early management logistics.

Keywords: Cardiovascular risk factors, operated coronary patients, prevalence, prevention, Morocco.

INTRODUCTION

The increasing incidence of atherosclerotic coronary artery disease in Morocco represents a real public health problem and generates an immense challenge to reduce cardiovascular morbidity and mortality.

In this work, we carried out a retrospective epidemiological study on a serie of 1009 coronary patients operated in the department of cardiovascular surgery “B”, at Ibn Sina University Hospital in Rabat.

The aim of this work is to analyze the factors predisposing to a high cardiovascular risk, in order to ensure a better individual and collective prevention.

Goals

- Establish the prevalence of cardiovascular risk factors among operated coronary patients.
- Study associations between cardiovascular risk factors (CVRF).
- Evaluate the impact of cardiovascular risk factors on the severity of the disease.

PATIENTS AND METHODS

- Retrospective epidemiological study on a serie of 1009 cases.
- Period: from January 2001 to October 2016.
- Location: Department of Cardiovascular Surgery "B", Ibn Sina University Hospital of Rabat.
- Review of 1453 Health records (medical and Operative report).
- Inclusion criteria: Patients operated for coronary insufficiency Coronary insufficiency caused by atherosclerosis, regardless of age.
- Exclusion criteria: non-atheromatous coronary insufficiency.

Variables to Assess

- Non-modifiable and modifiable cardiovascular risk factors.
- Left Ventricular Ejection Fraction.

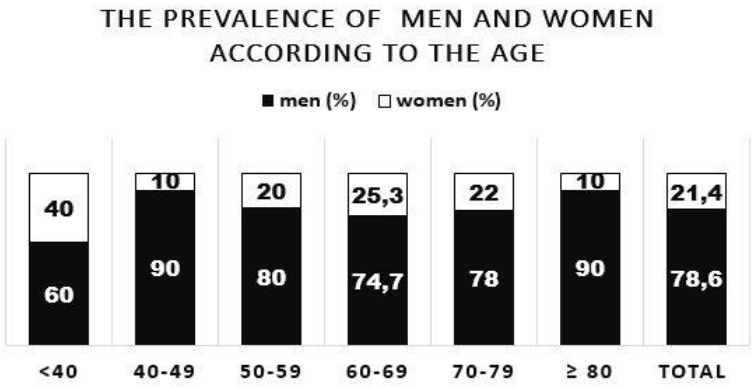
- Coronary artery lesions.
- Coronary artery bypass grafting (CABG).

RESULTS AND DISCUSSION

- Non-modifiable cardiovascular risk factors:

Age and Sex

The peak prevalence in women is between 60 and 69 years old, whereas it is between 40-49 years old and in 80 years old or over in men.



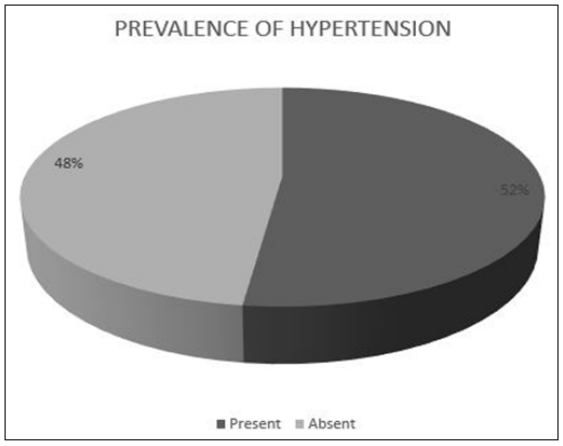
Inherited Cardiac Conditions:

4% of patients had a family history of coronary artery disease (CAD).

- Modifiable cardiovascular risk factors

HTN

524 (52%) of hypertensive patients.



- Similar prevalence to that observed in coronary patients in Tunisia [1].
- Higher than the prevalences recorded at the national level [2-4].
- It also exceeds thoses collected in Europe and Asia [5-7].
- However, it remains lower than what was recorded in the United States during the MESA study from 2000 to 2011 (60% of hypertensive patients in the global cohort) [8].
- Gender variation is consistent with national data and reported in other developing countries [9, 10]. However, it is the opposite of what is recorded in France, the United States and China [11-13].
- Increase by age is also noted in MONICA [7] and NHANES III studies [14] .

Positive associations between HTN and other CVRF

- HTN and metabolic syndrome: p <0.001.
- HTN and Obesity: p = 0.001.
- HTN and Dyslipidemia: p <0.001.
- HTN and chronic renal insufficiency: p = 0.02

Similar to EPIDIAM study's result in Morocco [14], and parallel to what was noted in Algeria [16]. Largely supported by previous studies and literature data [17, 18].

HTN and Left Ventricular Ejection Fraction

The prevalence of HTN is greater in patients who have a preserved ejection fraction (p <0.001).HTN particularly predisposes to heart failure with preserved ejection fraction (HFpEF), according to literature data [19, 20].

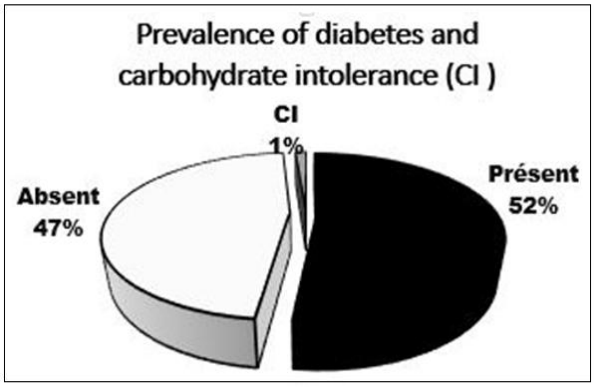
HTN and Coronary Artery Lesions

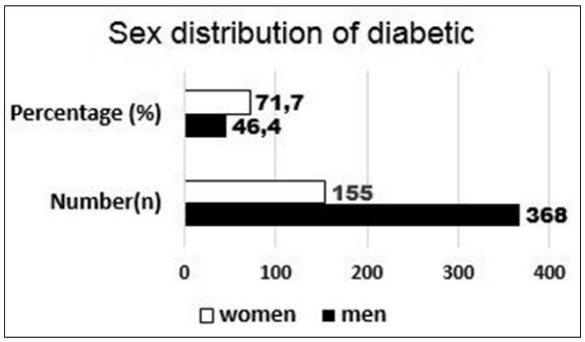
Higher prevalence of single-vessel and left main coronary artery disease in hypertensive patients without significant association (p = 0.12).

Treatment of Hypertension

57% are on monotherapy and 20% are well controlled.

Diabetes





- Prevalence is lower than that observed in coronary patients in Tunisia [21].
- It is higher than what is recorded in general population at national scale (11.3% urban), European [22, 23], Americain [24], and China levels [25].
- Higher prevalence among women, which is also reported in Algeria [24], unlike in Tunisia [26], France [13] and the United States [27], where it's the opposite.
- Prevalence varies with age, it gets more important between ages of 50 and 59, unlike other Maghreb countries where prevalence peaks were noted at the age of 65 [26]. In contrast, it was noted to be at age of 69 in Europe, 89 in Asia for Chinese and Japanese, and at the age of 69 in India.
- The majority had Long duration of diabetes > 10 years. Studies have shown a high risk of myocardial infarction in unbalanced long duration diabetes [28].

Positive associations between diabetes and other cardiovascular risk factors:

- Diabetes and Metabolic Syndrome: p <0.001.
- Diabetes and dyslipidemia: p = 0.04.

In accordance with literature data.

- Diabetes and hypertension: p = 0.05.

Lower prevalence of hypertension in diabetes compared to other studies (EPIDIAM Fez, Ibn Rochd University Hospital of Casablanca), and an african one in Benin.

Diabetes and abdominal obesity: p = 0.19.

Higher frequency of abdominal obesity in diabetic patients compared to non-diabetic ones. Positive association in previous studies and other Maghreb countries.

Treatment of Diabetes

- 40% of diabetic patients treated.
- 1.5% untreated.
- 58.5% of missing data regarding treatment.
- 37.6% of missing data regarding diabetes control in treated patients treated.

Diabetes and left ventricular ejection fraction

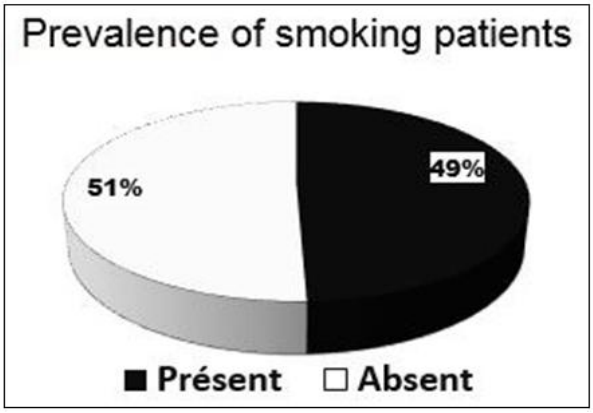
- Prevalence is proportionally parallel and strongly associated to left ventricular dysfunction (p = 0.001).
- Independent risk factor and predictor of left ventricular dysfunction based on literature data.

Result consistent with that of the epidemiological study USIK.

Diabetes and Coronary Artery Lesions

- Positive association between diabetes and three-vessel lesion (p = 0.02).

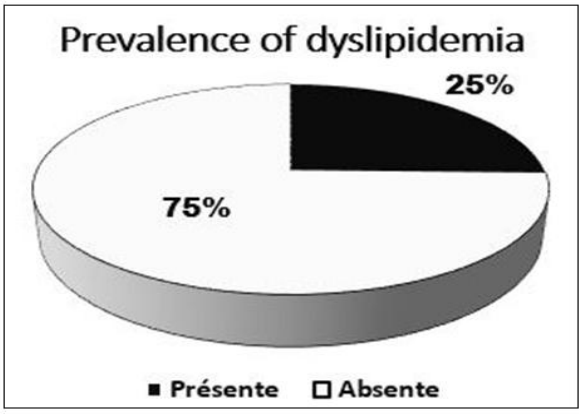
Smoking



- It exceeds the reported prevalence among general population at the national survey, Safi region, and neighborhood countries.
- On the other hand, it remains lower than the prevalence noted in coronary patients in Tunisia and Syria.
- Male: 62% vs Female: 2.7%.
- Smoking is predominantly a male addiction, rarely feminine, which is in harmony with the results of previous studies.
- Median consumption was 1 pack a day (1-1).
- Median chronicity: 20 years (10-30).
- Smoking cessation: 18.3%.

- Active smoking: 3.8%.
- Missing data: 27.2%.
- Median period of smoking cessation: 04 months (4-48).

Dyslipidemia



Total prevalence is 25%.

- It is lower than the prevalence recorded in spain coronary patients (between 64 and 74%).
- It remains lower than that recorded by general population in national survey (33.9%).
- It is lower compared to the prevalences recorded in industrialized and western countries.
- Prevalence of 32.8% for women vs 23.3% for men.

Consistent with data from the national survey, in contrast to what is reported in Algeria and the MONICA project, and different from Tunisia (H = F).

Associations between dyslipidemia and other FDRCVX

- Dyslipidemia and hypertension: p <0.01.

Result in accordance with what is reported in Mohamed VI University Hospital in Marrakech, in hypertensive diabetics, without any acute complication.

- Dyslipidemia and diabetes: p = 0.04.

Consistent with the results of the Framingham study and other studies in northern India, and also similar to what was previously noted in Morocco (Oujda).

Treatment of dyslipidemia:

- Treated: 13.7%.
- Statins: 11.7%.
- Fibrates: 0.4%.
- Missing data: 1.6%.
- Not treated: 2.3%.
- Missing data: 84%

Overweight, Obesity and Abdominal Obesity

- Total prevalence of overweight is 10%, while it is 10% for obesity and 6% for abdominal obesity with a clear female predominance and a clear proportional increase to age.
- Total prevalence of obesity is **lower** than that reported in neighboring countries, and also in France, China, Iran, Korea, the United States and Canada.
- Clear female predominance of obesity is reported by the national survey, and also by studies of other developing countries.
- Female predominance of abdominal obesity is noted among coronary patients in Pakistan, Tunisian population, and also Afro-Mexicans in the United States.

On the other hand, a lower prevalence has been recorded among women in North America, France, Korea, China, the Philippines and Oman.

Associations between obesity and other cardiovascular risk factors:

- Obesity and hypertension: p = 0.001.
- Obesity and metabolic syndrome: p <0.001.

Obesity is predictive of metabolic abnormalities and hypertension according to literature data.

Metabolic Syndrome

- Prevalence is 5%, proportionally parallel to age, with a female predominance.
- Prevalence is very low compared to what is reported in general population based on the NECPATP III criterias, whether it is in other developing or industrialized countries.
- Female > Male: in accordance with what is noted in general population, Algeria, the United States and Korea.
- In contrast, Male > Female in coronary patients in Pakistan, Europe, Australia, Latin America and non-Hispanic caucasians in the United States.

Chronic Kidney Disease (CKD):

- Prevalence of CKD is 3%
- Median age is 11 years [4-16], with about 50% of patients at the end-stage of dialysis.

Association of chronic renal failure and hypertension:

P = 0.02: Positive association, widely demonstrated by several studies around the world such as the PREVEND study, the Framingham studies and the ARIC study.

Other Modifiable Cardiovascular Risk Factors;

- Alcohol: 0.2%.
- Sedentary lifestyle: 0.8%.

Probably underestimated because we do not have indicators of physical activity levels of our patients.

- Depressive syndrome: 0.4%.

Very weak and does not fit with literature data.
May be under-diagnosed.

- Stress: 1%.

Qualitative risk factor that depends on individual variability.

Para-Clinical and Operative Data

Ultrasound Data

64.6% of patients had a preserved left ventricle ejection fraction.

Coronary Angiography Data

70.6% of patients had a three-vessel lesion.
23.7% of patients with main left coronary disease.

Coronary artery bypass graft

Higher prevalence of triple bypass (43%).

CONCLUSION

This study highlights a very high prevalence of hypertension, diabetes, and smoking among coronary patients. The study also made it possible to evaluate the risk posed by the association of cardiovascular risk factors in coronary patients, explaining the occurrence of coronary artery disease at an early age, and the severe clinical presentation encountered.

The practical implication for public health strategies is to enforce logistics preparedness in order to detect, diagnose, treat and monitor populations at risk.

Some recommendations for primary and secondary prevention of ischemic heart disease:

1. Diet and Lifestyle Changes.
2. Promotion of the importance of mental health and a stress-free life.
3. Early detection of cardiovascular risk factors.
4. Control of modifiable risk factors.
5. Treatment Optimization
6. Low-cost treatment access.
7. Prevention of tobacco use.
8. Stop Smoking Services.

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