

Comparative Study of Coronary Disease in Women and Man in Sub-Saharan Africa

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Received: 15 July 2018; Accepted: 25 August 2018

Citation: Dioum Momar, Ndiaye MB, Benaammouch S, et al. Comparative Study of Coronary Disease in Women and Man in Sub-Saharan Africa. *Cardiol Vasc Res.* 2018; 2(3); 1-3.

ABSTRACT

Introduction: Coronary artery disease is considered to be a male disease because of its clinical, paraclinical and therapeutic aspects compared for both sexes, yet it is the leading cause of death in women. Our study was done in order to do the comparison.

Methodology: We compared the data of patients who underwent coronary angiography or percutaneous coronary intervention at the cardiology clinic of Aristide Le Dantec hospital over a period of 6 months.

Results: Our study included 131 patients, with 91 men and 40 women, and a sex ratio (M/F) of 2.27. Women were older than men (59.27 ± 10.31 years old compared with 57.86 ± 11.63 years, $p=0.229$). A comparison of the frequency of risk factors for atherosclerosis in both sexes led to a higher co-morbidity in women ($p=0.005$). Women had more atypical pain than men, ie 62.5% versus 28.52% ($p=0.0001$). Non-ST elevation myocardial infarction were less common in women 37.5% than in men 51.65% ($p=0.135$). On the other hand, non-ST elevation myocardial infarction predominated in women 30% vs 13.9% ($p=0.062$). Coronary angiography showed a predominance of mono-vessel coronary artery disease in men 31.8% vs. 25%, ($p=0.53$) and three-vessel coronary artery disease in women 37.5% vs 31.8% ($p=0.61$). Twenty-one patients had thrombolysis, including 18 men and 3 women ($p=0.192$). Primary percutaneous coronary intervention was performed in 4.4% of men and 5% of women, respectively ($p=0.87$). Women had less benefited from programmed percutaneous coronary intervention, ie 22.5% against 27.47% ($p=0.54$).

Conclusion: Our study shows that women with coronary artery disease are older and have many factors. The clinical presentation is often atypical hence a delay in diagnosis compared to men. They have more severe coronary artery disease and benefit from less aggressive treatment strategy.

Keywords

Coronary heart disease, Woman, Man, Coronary angiography, Senegal.

Introduction

Coronary heart disease is a real public health problem in the world. Often considered as a male disease, it is the first cause of death for women [1]. The death rate from coronary artery disease is decreasing in men, whereas it is stable, and even increasing

among women, especially young women (under 55 years old). It has become a real stake in public and societal health [2-7]. Indeed, coronary heart disease in women is often poorly diagnosed or insufficiently managed.

Until then, the female population was under-represented in randomized studies, but recent data from registers and studies have been collected from female populations [8]. Unfortunately, there is still little data on coronary artery disease in sub-Saharan Africa.

The aim of our study was to compare aspects of coronary heart disease between women and men at Aristide Le Dantec University Hospital in Dakar.

Methodology

This was a monocentric, descriptive and analytical study that had been conducted at the Aristide Le Dantec Hospital Cardiology Clinic over a period of 6 months (October 1st, 2017 to March 31st, 2018). We included all patients who underwent coronary angiography or percutaneous coronary intervention during the study period. The patients were divided into two groups: women and men.

Epidemiological data (age and sex), cardiovascular risk factors (arterial hypertension, diabetes, smoking, sedentary lifestyle, obesity and dyslipidemia), clinical data (presence or absence of chest pain and other associated signs), paraclinical data (electrical aspects, presence of obstructive or non-obstructive disease, types of lesions and number of arteries affected) and management therapy (angioplasty, thrombolysis and medical treatment) were studied from the files. The data entry was done with the software "Sphinx" version 5.1.0.2. The analysis of the data was done using SPSS (Statistical Package for Social Science) version 18. The averages and percentages were compared using the Student's test, the Chi-square test, and the exact Fischer test, depending on their condition of applicability. Any difference of less than 0.05 was considered statistically significant.

Results

Our study included 131 patients, with 91 men and 40 women, and a sex ratio (M/F) of 2.27. Women were older than men at 59.27 ± 10.31 years compared with 57.86 ± 11.63 years ($p=0.229$). Their general characteristics were mentioned in Table 1. In comparison with men, the frequency of risk factors for atherosclerosis led to a greater comorbidity in women. In fact, women were significantly more often diabetic (57.5% vs 26.4%, $p=0.001$), hypertensive (70% vs. 47.3%, $p=0.016$) and sedentary (75% vs. 38.5%, $p=0.0001$). On the other hand, they were less smokers (5% vs. 24.1%, $p=0.0001$). Obesity is relatively more common among women with no statistically significant difference ($p=0.127$). Typical anginal pain was more common in the male population (55% vs. 25%, $p=0.012$). Women had more atypical chest pain than men, ie 62.5% versus 28.52% ($p=0.0001$). Atypical signs predominated in the female population compared to men (dyspnea 50% vs. 28.6%, $p=0.017$) ; digestive signs were 35% vs 17.7%, $p=0.001$. Non-ST segment elevation myocardial infarction (NSTEMI) were less common in women 37.5% versus 51.65% in men ($p=0.135$). In contrast, NSTEMI (non-Q-wave myocardial infarction and unstable angina) predominated in women (30% vs 13.9%, $p=0.062$).

The rate of troponin was almost similar for women and men, respectively 29.06 ± 32.39 ng / ml against 28.06 ± 27.97 ng / ml ($p=0.937$). In echocardiography, the left ventricular ejection fraction in women was $53 \pm 13.09\%$ compared to $48.71 \pm 10.24\%$ in men ($p=0.04$).

Thirty-eight patients (29.69%) had normal coronary angiography, among them 15 women (38.5%) and 23 men (25.8%) ($p=0.156$). The angiographic profile of the patients was distributed in Table 2. Coronary angiography showed a predominance of mono-vessel disease in men (31.8% vs. 25%, $p=0.362$) and three-vessel disease in women (37.5% vs. 31.8%, $p=0.53$). Two-vessel disease was similar in both sexes (37.5% vs. 36.3%, $p=0.79$). There was less involvement of the left common artery in women (1 woman vs 8 men, $p=0.19$). Women had more severe lesions (type C lesion) compared to men (20.8% vs 7.6%, $p=0.002$). Twenty-one patients had thrombolysis including 18 men and 3 women. Mean time to thrombolysis after the onset of chest pain was longer in women (6 hrs 25 min \pm 2 hrs 62 min versus 4 hrs 18 min \pm 2 hrs 46 min in men, $p=0.149$). Primary percutaneous coronary intervention (PCI) was performed in 4.4% of men and 5% of women, $p=0.87$. Women had less benefited from programmed PCI (22.5% vs. 27.47%, $p=0.54$). Medical treatment was initiated in 41.7% of women vs 36.4% of men ($p=0.57$).

Parameters	Total (n=131)	Women (n=40)	Men (n=91)	p
Age	58.29 \pm 11.22 ans	59.27 \pm 10.31 ans	57.86 \pm 11.63 ans	0.229
Hypertension	71 (55.6%)	28 (70%)	43 (47.3%)	0.016
Diabetes	47 (35.8%)	23 (57.5%)	24 (26.4%)	0.001
Dyslipidemia	39 (29.7%)	15 (37.5%)	24 (26.4%)	0.2
Obesity	20 (15.2%)	9 (22.5%)	11 (12.1%)	0.127
Physical inactivity	65 (49.6%)	30 (75%)	35 (38.5%)	0.0001
Tobacco	24 (18.3%)	2 (5%)	22 (24.1%)	0.0001
typical thoracic pain	60 (45.8%)	10 (25%)	50 (55%)	0.012
Atypical thoracic pain	50 (38.1%)	25 (62.5%)	25 (28.5%)	0.0001
STEMI	62 (47.3%)	15 (37.5%)	47 (51.6%)	0.135
NSTEMI	25 (19%)	12 (30%)	13 (13.9%)	0.062
Troponin (ng/ml)	18.7 \pm 26.8	16.7 \pm 27.9	19.94 \pm 26.67	0.726
Mean LVEF	50 \pm 11.32%	53 \pm 13.09%	48 \pm 10.24	0.04

Table 1: General characteristics of population.

STEMI: ST elevation myocardial infarction; NSTEMI: Non-ST elevation myocardial infarction; LVEF: Left Ventricular Ejection Fraction.

Parameters	Total (n=131)	Women (n=40)	Men (n=91)	p
Healthy coronary arteries	38 (29,6%)	15 (38,5%)	23 (25,8%)	0,156
No-significant lesions	50 (38,1%)	25 (62,5%)	26 (28,5%)	0,0002
Significant lesions	25 (19%)	12 (30%)	13 (13,9%)	0,003
Mono-vessel	40 (30%)	10 (25%)	30 (31,8%)	0,362
Two-vessel	47 (36,6%)	15 (37,5%)	32 (36,6%)	0,79
Three-vessel	44 (33,5%)	15 (37,5%)	29 (31,8%)	0,53

Table 2: Angiographic profile of population.

Discussion

Claassen and Co note in their meta-analysis a predominance of coronary disease in men compared to women [9]. These observations are similar with our study, where there is a higher proportion of

coronary artery disease in men. As found in the literature [10, 11], women with coronary artery disease are relatively older than men. This is explained by the protective hormonal effect that benefits women before menopause. The weight of cardiovascular risk factors is greater for women in our work. These data corroborate those of Srichaiveth [10] who found a female population at high cardiovascular risk (diabetic, hypertensive, obese) compared to men. The initial clinical presentation is often atypical in women unlike men. This is found in the meta-analysis of Claassen and Co [9], in the Madika study and the FAST MI register [1,12]. Coronary angiography found more healthy coronary arteries in the female population compared to men despite the presence of a typical angina. This challenge is found in the CASS study [13]. However, coronary atheroma is more severe, more extensive and more diffuse in women than in men. This is found in our work where we saw more three-vessel coronary artery disease (37.5% vs 31.8%) and more type C lesions (20.8% vs 7.6%, $p=0.002$). The average time to onset of thrombolysis is longer in women. This is especially atypical clinical symptomatology. Women are less well managed during acute coronary syndrome (thrombolysis, PCI, drugs and bypasses). Similar observations are made in the literature [14-17].

Limits of the Study

The size of our study population is relatively small. The duration of the study is short. Larger multicenter prospective studies are needed to validate our findings in sub-Saharan Africa.

Conclusion

Our study shows that coronary artery disease occurs at a later age compared to men. Women with coronary artery disease are at high cardiovascular risk. The symptoms are often atypical hence a delay in diagnosis compared to men. They have more angina with healthy coronary arteries. However, obstructive coronary disease is more severe in women. Therapeutic management is insufficient compared to men.

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