

Prevalence and characteristics of acute coronary syndromes in a department of Cardiology in Senegal

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Abstract

Introduction: Acute coronary syndrome (ACS) is a recent clinical and biological entity that gathers myocardial ischemias. Our objectives were to describe the prevalence, characteristics and management of ACS in a department of cardiology in Dakar, Senegal.

Methodology: This is a prospective and descriptive study conducted from January to December 2016 in the Cardiology Department of Grand Yoff General Hospital. We included all patients admitted to the cardiology department for acute coronary syndrome. Data analysis was done using SPSS software version 17.0, with comparison of quantitative and qualitative variables. A value of $p < 0.05$ was considered significant.

Results: One hundred and forty-five patients had acute coronary syndromes, with a hospital prevalence of 19.33%. The average age of the patients was 58.86 years with a sex ratio of 2.1. Clinical presentation was dominated by persistent ST-elevation myocardial infarction (STEMI) in 87.58% of cases. Non-persistent ST-segment elevation myocardial infarction (NSTEMI) were represented by non-Q-wave myocardial infarction in 10.34% of cases and unstable angina in 2.08% of cases. More than half of our patients (54.1%) were transferred versus 45.9% of direct admission. Fibrinolysis with streptokinase was performed in 8.13% of cases. Average reperfusion time was 5.74 hours. The hospital mortality rate was 6.6%. There was a correlation between the delay: onset of symptoms-onset of thrombolysis and results of thrombolysis ($p=0.037$).

Conclusion: The clinical presentation is dominated by acute persistent ST-segment elevation myocardial infarction. Admission times are long and hospital mortality is important.

Introduction

Acute coronary syndrome is a recent clinical and biological entity that regroups myocardial ischemias (MI). There are now two groups of ACS [1-3]: persistent ST-elevation myocardial infarction (STEMI) and non-persistent ST-segment elevation myocardial infarction (NSTEMI). NSTEMI is subdivided into two entities: unstable angina in the absence of markers of cellular necrosis, and infarct without Q wave when there is a release of these markers.

ACS is the leading cause of death in industrialized countries. In Africa, its prevalence is increasing in relation to the westernization of life habits, the improvement of socio-economic conditions and the increase in life expectancy [1].

Methods

We conducted a prospective and descriptive study from January 2016 to December 2016. This study included all patients admitted to the cardiology department of Grand Yoff General Hospital for ACS. The diagnosis was based on clinical signs (anginal pain), electrocardiogram with persistent ST-segment elevation, ST-segment depression or negative T-wave (NSTEMI) in at least two contiguous shunts of the same coronary territory, and troponinemia. Clinically associated abnormalities of the troponinemia and electrocardiographic changes led to the diagnosis of STEMI and NSTEMI (including non-Q-wave myocardial infarction, and unstable angina if negative troponin).

The therapeutic management strategy was chosen under the recommendations of the European Society of Cardiology (ESC) [3,4].

This means doing primary percutaneous coronary intervention (PCI) if the presumed time of First Medical Contact (FMC) to angioplasty (balloon swelling) is less than 2 hours. Otherwise, fibrinolysis is an option. Streptokinase was the only thrombolytic used in all patients, at a dose of 1.5 million units in 50 ml of 5% glucose, or 0.9% NaCl over 45 minutes intravenous syringe. The success of fibrinolysis was evaluated at the 90th minute on clinical criteria (retrocession of chest pain) and electrical criteria (occurrence of an accelerated idioventricular rhythm or regression of ST elevation of more than 50% of its initial amplitude in the diversion where it was the largest).

A questionnaire collected epidemiological and clinical data. The data was entered on an Excel spreadsheet. Statistical study was performed using SPSS software version 17.0 with comparison of quantitative variables (Student's test) and qualitative variables (Pearson chi-square test and Fisher's exact bilateral test). A value of $p < 0.05$ was considered significant.

Results

We had 145 patients with a hospital prevalence of 19.33% and a sex ratio of 2.1. The clinical presentation (Figure 1) was dominated

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by STEMI in 87.58% of cases. NSTEMI was noted in 12.42% of cases, including 10.34% of non-Q-wave myocardial infarction and 2.08% of cases of unstable angina. Arterial hypertension was the most frequent cardiovascular risk factor, which was found in 60.65% of cases, followed respectively by diabetes (40.98%), dyslipidemia (27.86%), physical inactivity (27.86%) and smoking (19.67%) (Figure 2).

The main reason for consultation was anginal pain (98.4%). Killip's physical examination was normal in 75.4% of cases. We noted heart failure in 24.6% of cases, including 8.19% of cardiovascular collapse. Ultra-sensitive troponin was assayed in 93.4% of our patients with 91.80% positivity. The random blood glucose achieved on admission was high (63.93%). As lipid abnormalities, we noted hyper LDLc in 22.95% of cases, and hypo-HDLc in 11.47% of cases.

On the electrocardiographic level, the anterior MI is the most frequent, found in 52.44% of cases. It showed anterior-septo-apical predominance 19.67%, extensive anterior 16.39%, anterior 11.47%, antero-septal 4.91%, followed by the inferior territory in 42.52%. An extension to the right ventricle was found in 16.39% of patients admitted for STEMI, all in relation to an inferior MI. Other electrocardiographic abnormalities were dominated by ventricular extrasystole (4.91%), atrial fibrillation (1.6%), and right branch-type conduction disorder

(complete 4.91%, incomplete 3.27%), complete atrioventricular block in 4.91% and first degree in 3.27% of cases.

At the Doppler echocardiography, hypokinesia was the most common segmental kinetic disorder of the left ventricle, found in 74.64% of cases, followed by akinesia (23.40%). The most affected territories were septal in 37.70% of cases followed by the former (22.94), apical (21.31%) and inferior (18.03%) territories. Systolic function of the left ventricle was impaired in 63.83% of cases.

Thrombolysis was performed in 61 patients before the 12th hour of onset with a success rate of 59.02%. Streptokinase was the only thrombolytic used. There is a correlation between onset of symptoms - early thrombolysis and thrombolysis results ($p=0.037$). All of our patients received heparin, a double platelet antiaggregant (aspirin and clopidogrel) and statin. Intra-hospital evolution was favorable in 77% of cases. The mortality rate was 6.6% and it increased insignificantly with age ($p=0.05$). However, the male gender was clearly at risk of death ($p=0.025$).

Discussion

As the leading cause of death in industrialized countries [5], the 2006 MONICA study shows a higher proportion of STEMI in acute coronary insufficiency with 56% of ACS [6]. In developed countries, improved

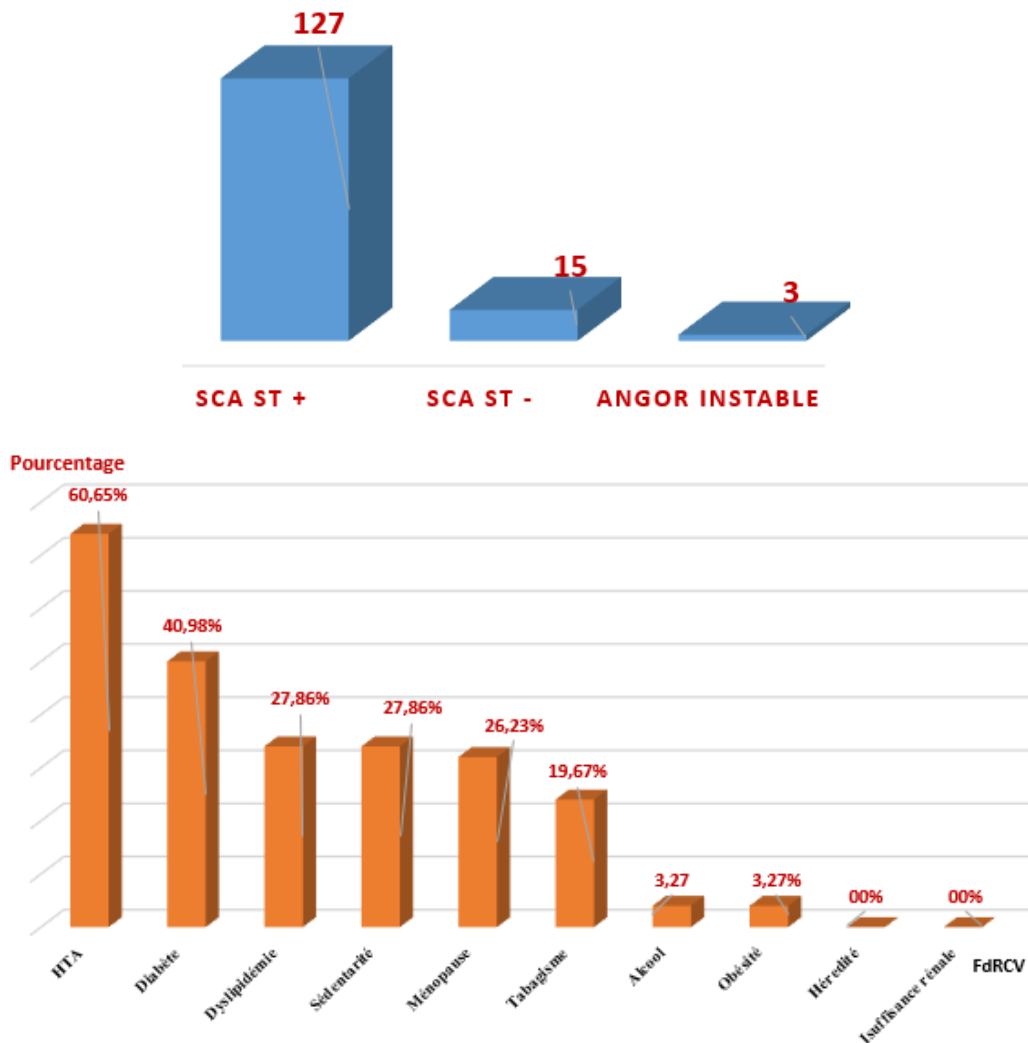


Figure 2. Distribution by Cardiovascular Risk Factors (N=61)

management of cardiovascular risk factors has reduced the incidence of myocardial infarction. We are also witnessing a decline in STEMI forms, and the emergence of NSTEMI forms due to the improvement of diagnostic means [7]. In Africa, its prevalence is increasing in relation to the westernization of lifestyle habits, the improvement of socio-economic conditions and the increase in life expectancy [8]. This one rose from 3.17% in 1991 in the CORONAFRIC survey to 4.05% in Dakar in 2006 [1] and 19.33% in this study.

Two-thirds of myocardial infarction cases occur in a man. The incidence of myocardial infarction increases with age [9]. In our study, the average age of our patients was 58.86 years. Bouhajja B, *et al.* in a prospective study in Tunisia reported an average age of 57 ± 11 years (20 to 86 years), with a clear male predominance (sex ratio=6) [10]. In Africa, the increase in the prevalence of these conditions is accompanied by a decrease in the average age of onset (57.1 ± 3.5 years in Senegal and 55.5 ± 11.6 years in Tunisia) [1,10]. This disparity could be explained on one hand by the much higher life expectancy in these countries, but especially by the lack of effective programs to fight cardiovascular risk factors in Africa; while the presence of at least one risk factor is the rule for ischemic heart disease [11].

The diagnosis of ACS relies heavily on the reading of the electrocardiogram (ECG). This first complementary examination is the cornerstone of initial management, which may be life-threatening.

Anterior MI is the most common in our study (52.44%). Several authors have confirmed the predominance of the anterior territory invasion during ACS, followed by the inferior territory. This predominance was reported by Mboup (61%) in Senegal, Bouhajja (50.89%), and Akoudad (66%) in Tunisia [1,10,12]. An extension to the right ventricle occurred in 10 patients (16.39% of cases) all related to an inferior MI (100%). Mboup in his series found a slightly lower rate (13.6%) [1].

Echocardiography is a key, particularly useful in the acute diagnosis of ischemic heart disease, and especially for the evaluation of differential diagnosis. In the USIK 2000 study, heart failure complicated 29% of ACS [13]. In industrialized countries, mortality of ACS remains low. We recorded a lower mortality rate of 6.6% compared to Mboup (15.25%), (33%) [1,10]. There was a correlation between mortality and age ($p=0.05$) and mortality and gender (male) ($p=0.025$).

Conclusion

In Africa, the prevalence of acute coronary syndrome is increasing with a relatively young age of onset. Improving the management of these conditions in our developing countries requires effective primary prevention through information campaigns, awareness campaigns, and the fight against cardiovascular risk factors.

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