



## Acute Coronary Syndromes in the Cardiology Service and Internal Medicine of the Brazzaville CHU

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### Summary

**Objective:** To determine the epidemiological, clinical, therapeutic and evolutionary aspects of acute coronary syndromes.

**Patients and Method:** A retrospective and descriptive cross-sectional study was conducted in the cardiology department of the University Hospital Center of Brazzaville over a period of 2.5 years. It included 50 patients with chest pain associated with electrocardiographic changes.

**Results:** The frequency of coronary syndrome was 2.3%. The mean age of the patients was 62.5 years  $\pm$  9.7. Our population consisted of 30 men and 20 women. The RDFs were as follows: arterial hypertension (n = 45), dyslipidemia (n = 22), diabetes (n = 11), obesity (n = 10), tobacco consumption (n = 2). The average consultation time was 102  $\pm$  60 hours. Chest pain was typical in 31 patients. The territory most concerned by ischemia was earlier than 28 cases. The syndrome was associated with ST segment elevation in 26 patients. The troponin assay was positive in 17 patients.

**Conclusion:** Acute coronary syndrome is relatively rare at Brazzaville University Hospital. Medical treatment is the most used strategy. Complications are common.

**Keywords:** Acute Coronary Syndromes; Brazzaville; Chest Pain; Complications; Electrocardiogram

### Introduction

Acute coronary syndromes (ACS) are serious pathological conditions worldwide [1-5], whether transmural myocardial infarction, or ST segment elevation SCA (SCA. ST +) or the nosological group called SCA without ST segment elevation (SCA ST-), associating unstable angina and non-Q-wave infarction or endocardial infarction. In 2000, KimballyKaky and Bouramoué in Congo [6] over a period of 25 years collected 743 patients with ischemic heart disease. Of these, 189 or 25.4% had myocardial infarction. All aspects of the management of ischemic heart disease are challenges. But it is possible to identify two main ones:

- The fight against cardiovascular risk factors as a measure of primary prevention in the community and secondary prevention for identified coronary heart disease. This measure is all the more important since these risk factors are for the most part common to all chronic noncommunicable diseases.

- The management of coronary syndromes with the aim of reducing mortality and the occurrence of complications and improving the quality of life of these patients. We undertook this work with the objectives of:
  - Evaluate the frequency of acute coronary syndromes,
  - Identify the epidemiological and clinical aspects,
  - To identify the various methods of management, and to evaluate the evolution of acute coronary syndromes.

## Patients and Method

This was a cross-sectional, retrospective and descriptive study, conducted from January 1, 2014 to June 31, 2016 (2.5 years). The study took place in the Cardiology and Internal Medicine department of the Brazzaville University and Hospital Center (CHU), located on the third floor of the five-storey building. The service is led by a Professor of Cardiology. The medical staff includes four hospital and university cardiologists and three hospital cardiologists. The paramedical team included: two supervisors, 11 state-certified nurses, three technical assistants, one health aide, six surface technicians, a social worker and a secretary. The department trains 16 students enrolled in the Diploma of Specialized Studies (D.S.S.) in cardiology from the Faculty of Health Sciences (MarienNgouabi University). The capacity of the service is 42 beds distributed in 2 individual rooms and 7 common rooms (one of four beds, the others of six beds each). The hospitalization section is subdivided into four areas supervised by a cardiologist. During the study period, 2085 patients were hospitalized in the department including 50 patients for acute coronary syndromes. We received the record of hospitalized patients for chest pain in the Cardiology and Internal Medicine Department of the University Hospital of Brazzaville. We included those patients with an age between 30 and over whose electrocardiogram showed lesions, ischemia with or without preexisting necrosis; and having benefited from biological explorations (standard and troponins), radiological and echo cardiographic. Patients with associated cardiomyopathy who had myocardial infarction sequelae without evidence of acute coronary artery disease were not included in the study.

The diagnosis of STEMI was made in the following cases: resting chest pain, prolonged (> 20 min), retrosternal bar, constrictive, very violent, radiating to the jaws and upper limbs until the last two fingers of the left hand, trinitro-resistant, with anguish and a sensation of impending death. In this symptomatology were associated on a 17-lead ECG, the signs of myocardial necrosis in myocardial territory and in biology the elevation of troponin and CK-MB, markers of myocardial necrosis.

The diagnosis of NSTEMI was made in the presence of prolonged angina chest pain (> 20 min), a 17-lead ECG at best pericritical, without ST-segment elevation, or with negative T-waves or positive T-waves. pointed, high myocardial enzymes. This made it possible to retain the diagnosis of a Q-wave-free MI. Unstable angina was retained when the myocardial enzymes were normal.

The data was collected on a pre-established survey sheet. The clinical examination was carried out by the doctors of the service, as well as the electrocardiogram and the echocardiography. The biology was carried out at the CHUB laboratory. Data were entered and analyzed on computer with Epi software version 3.5.1 and Microsoft Excel 2007. Quantitative variables were expressed as mean  $\pm$  standard deviation and extremes; qualitative variables in number and percentage. The Chi2 test was used to compare the proportions of the patients. The threshold of significance was set at  $p < 0.05$ .

## Results

### Frequency of SCA and Sociodemographic Characteristics of Patients

- We recorded 50 cases of coronary syndromes among 2085 hospitalized patients, an estimated frequency of 2.3%. In 2014, five patients were admitted (10%), 25 or 50% in 2015 and 20 or 40% from January to June 30, 2016.
- The 50 patients, divided into 30 men and 20 women, were on average  $62.5 \pm 9.7$  years old (range: 43 and 89 years). Six patients (12%) were under 50 years old, 35 (70%) were between 50 and 70 years old, and nine patients were over 70 years old.
- Eight patients (16%) had primary level, 28 (56%) secondary, and 14 patients (28%) had a superior level.
- Eighteen patients were without profession, 15 others were senior managers, and eight were workers.
- The marital status was indicated in 23 cases. The series included 18 married, three single and two divorced.

### 5.1. Data from the Pre-Hospital Phase

The consultation time was  $102 \pm 60$  hours (range 10-168 hours). Eight patients were hospitalized before the 12th hour.

In 38 cases, the patient had consulted the medical emergencies of the hospital. Ten patients were referred from a private clinic and two to a basic hospital. Six of the eight patients who consulted before the 12th hour were referred from a private clinic.

## Cardiovascular Risk Factors (CRF) and Antecedents (ATCD)

### Cardiovascular Risk Factors

HTA was observed in 45 cases. Twenty-two patients had dyslipidemia. Cardiovascular FDRs are hypertension (n = 45), dyslipidemia (n = 22), diabetes (n = 16), obesity (n = 14) and smoking (n = 3).

- The reported antecedents were: stroke (six cases, 12%), MI (six cases as well), arteritis obliterans of the lower limbs (four cases, 8%).
- All patients were sedentary, 27 reported daily stress, 16 admitted to drink alcohol without moderation.
- Twenty-seven patients had two cardiovascular FDRs: hypertension and diabetes (n = 15, or 30%), hypertension and dyslipidemia (n = 13, 26%), and hypertension and ischemic ATCDs. acute (n = 11, 22%).
- In seven patients, three FDRs were associated: hypertension, diabetes and dyslipidemia. And in 3 patients, it was hypertension, diabetes and a history of acute ischemia.

### Other Antecedents

Two of our patients had previously undergone angioplasty with stent implantation (in Switzerland in 1990 and in Morocco in 2000).

Five patients had heart failure related to dilated cardiomyopathy of ischemic origin. All patients enrolled in our study were postmenopausal.

### Clinical Expression

Chest pain was typical and constant in 31 patients. She was the type of blokpnea in 12 cases, and sat in the epigastrium in five other cases. This chest pain was accompanied by syncope in six cases, headache and dizziness in one case. The level of consciousness was normal in 47 patients. The Glasgow score averaged  $14.3 \pm 1.8$  (range: 7-15). The average temperature was  $37.1 \text{ }^\circ\text{C} \pm 0.4$  (range: 35-38.5  $^\circ\text{C}$ ). Eight patients (16%) had a fever.

The clinical examination was normal in 35 patients. The heart rate averaged  $83.9 \pm 24.4$  beats per minute (range: 34-144). Tachycardia was observed in 12 patients and bradycardia in three others. The mean systolic blood pressure (BP) was  $142.9 \pm 37.6$  mmHg (range: 120-210 mmHg), and the mean diastolic blood pressure was  $83.8 \pm 24.4$  mmHg (range: 70-150 mmHg). ). The most common PAS and DBP levels were between 140 and 159 mmHg PAS (n = 22) and between 60 and 89 mmHg DBP (n = 25).

### Paraclinical Examinations

A frontal chest radiograph was performed in 44 patients (88%). The mean cardiothoracic ratio was  $58 \pm 8\%$  (range: 45-72%). Cardiomegaly was observed in 33 of these patients (75%). The rhythm was sinus in 40 cases. In six cases there were numerous ventricular extrasystoles and only in two cases supraventricular extrasystoles. We observed one case of atrial fibrillation and another case of idioventricular rhythm.

The average duration of the PR segment was  $159 \pm 36$  milliseconds (range: 120-240 ms). A flat or negative T wave was present in 36 patients, 18 had ST segment elevation and 14 had a necrosis Q wave. The conductive disorders were as follows: BBG (11 cases), BAV1 (10 cases), BAV3 (3 cases), and BBD (3 cases). The appearance of SCA ST + was observed in 26 cases (52%) and SCA ST- in 24 cases (48%). The electrocardiographic abnormalities as well as the SCA varieties and different topographies are indicated respectively in (Table 1&2).

	STEM n (%)	NSTEM n (%)
Anterior	2 (4%)	8 (16%)
Antero-septal	13 (26%)	5 (10%)
Apical	4 (8%)	-
Lateral	1 (2%)	10 (20%)
Iower	-	1 (2%)
Deep Septal	5 (10%)	-
Right Ventricle	1 (2%)	-

**Table 1:** Varieties of SCA and different topographies.

The dosage of cardiac enzymes was carried out in the following proportions: 12% (LDH), 16% (CPK-MB) and 60% (troponin). In the thirty patients who were able to perform the troponins, the assay was positive in 56% of cases.

The troponin assay was performed at 3 days  $\pm$  2.8 (range: 1-7 days). The troponin assay was qualitative. Performed in 30 patients, it was positive 17 times (56.7%). This was SCA ST + in 16 cases (53.4%) and non-Q-wave infarction in one case (3.3%). We found leukocytosis, anemia and hyperuricemia in the following proportions: 25%, 10.3% and 7% respectively. One-third of the patients had severe renal impairment, and the end-stage patients were 7.4%. The CPK fragments of myoglobin, the lacto-dehydrogenase, and the transaminases were, on average, normal, as well as the sedimentation rate. Doppler echocardiography was performed in 33 patients (66%). The mean LV ejection fraction (LVEF) was  $54.5 \pm 15\%$  (range: 31-84). It was less than 40% in eight cases. An intracavitary thrombus was observed in two cases. The mitral profile was of type: restrictive in seven times, pseudonormal 11 times. A relaxation disorder was noted in 15 cases.

She highlighted an abnormality of segmental kinetics in 32 cases. The segmental kinetic abnormalities observed were: hypokinesia (18-fold, 54.5%); akinesia (13 times, 39.4%); dyskinesia (2 times, 6.1%). Topography of the lesions on ultrasound were in order of decreasing frequency: anteroseptal (66.6%), septal (54.1%), inferolateral (16%), lateral (12.5%), inferoseptal (8%), anterolateral (8%) and apical (4.1%).

	<b>STEMI n (%)</b>	<b>NSTEMI n (%)</b>	<b>P</b>
Male	15 (30%)	10 (20%)	0.04
High Blood Pression	38 (76%)	22 (44%)	0.33
Dyslipidemia	8 (16%)	9 (18%)	0.03
Diabetes	4 (8%)	9 (18%)	0.47
Tabacco	-	2 (4%)	0.04
Deaths	13 (26%)	-	0.001

**Table 2:** CRF and deaths by type of ACS.

At the end of the clinical and paraclinical examinations, an SCA ST + was retained in 26 cases (52%), an SCA ST- in 24 cases (48%). In eight cases, 16.0%, acute coronary syndrome was associated with dilated ischemic cardiomyopathy.

### **Complications**

The complications were hemodynamic 30%, rhythmic and conductive 10% then thromboembolic 6%. Of the 13 patients with heart failure, ten were in Killip stage II, two in stage I, and one in stage III. Cardiogenic shock was found in two patients.

### **Therapeutic Aspects**

#### **Conditioning and Treatment**

All patients were put to strict rest. An analgesic treatment was administered in 43 cases, an anxiolytic in 28 cases and oxygen in one case. Electrocardiographic monitoring was not available. Double anti-platelet aggregation was applied in all cases (Aspegic® 75mg or 100mg and Clopidogrel® 75mg). Enoxaparin was given to 14 patients at a preventive dose and 36 at the curative dose.

#### **Basic Treatment of Ischemic Heart Disease in the Acute Phase**

Betablockers were prescribed to 35 patients, blockers of the renin angiotensin aldosterone system to all patients. They were inhibitors of the converting enzyme in 43 cases, Sartans in five cases. Nitrate derivatives or Molsidonine were prescribed in 23 cases. The use of a statin has been systematic.

#### **Other Medicines**

We prescribed loop diuretics (Furosemide) in 15 patients with IC. Dobutamine has been associated in three of them. Amlodipine has been used in five hypertensive patients. The other drugs used were: proton pump inhibitors seven times, insulin (six patients) and

oral antidiabetic drugs five times, amiodarone once, verapamil once also. Heparin of low molecular weight was prescribed and relayed by antivitaminic K in three patients. No revascularization procedure was applied.

## Evolution

The mean duration of hospitalization was  $15 \pm 3$  days (range: 9-21). Thirteen patients (26%) died. They all had STEMI. Control ECGs were performed in 38 patients (76%).

## Clinical Evolution

Mean heart rate (HR) and mean arterial pressure (AR) at admission and exit were: systolic BP at entry  $142.9 \pm 37$  versus  $110.3 \pm 59.7.6$  ( $P = 0.02$ ), diastolic BP  $83.8 \pm 24.4$  versus  $49.2 \pm 37.2$  ( $P = 0.1$ ) and FC  $83.9 \pm 23.4$  versus  $47.4 \pm 36.3$  ( $P = 0.1$ ). A sinus rhythm was noted in 94% of our patients at the entrance versus 72% at the exit with a  $p = 0.03$ .

## Discussion

In Europe [7, 8], the annual incidence of SCAs is about 80 per 100,000 population. In sub-Saharan Africa, coronary pathology is poorly described [9]. Thus in this work, we reported a hospital frequency of ACS of 2.3% whereas Diao et al [10] in Senegal, evaluated it at 4.1%. At the University Hospital of Brazzaville, KimballyKaky and Bouramoué [6] reported in 2000 a frequency of 2.4%. Diarra et al in Mali [11] and Yaméogo et al [12] in Burkina Faso noted respective frequencies of 2.6 and 3.5%. However, the frequency of ischemic heart disease is likely to increase due to changes in lifestyle (westernization trend) of our populations and improvement of diagnostic tools. The mean age of our patients was  $62.5 \text{ years} \pm 9.7$  (range: 43 and 89 years), comparable to that reported in South Africa  $60.5 \pm 12.6$  years [13], Maghreb  $60 \pm 10$  years [14, 15] and in France  $61 \pm 15$  years [16]. On the other hand Diao [10] revealed a younger average age:  $57.1 \pm 3.5$  years. Like several authors [10-15], we have noted a male predominance. Although studies [17] have shown an increasing frequency of ischemic heart disease in young women, particularly because of the combination of contraceptive pill and smoking, this entity is more rare in women before menopause. In Europe, the prehospital course is organized consisting of the management of the patient by firefighters or the EMS at home, treatment and conditioning, or even thrombolysis during transport. This is generally not the case in sub-Saharan Africa where patients come to the hospital by their means, directly in the emergency services or following a transfer from a health center. The lack of information of the population explains the long delays before the consultation of quality. Thus, the average consultation time in our study was  $102 \pm 60$  hours (range: 10-108 hours). Only nine of our patients were admitted before the 12th hour, maximum delay of thrombolysis in our context (Dakar, Ouagadougou ...) [10, 12]. This one is not yet practiced in our hospital. The Senegalese and South African authors [10, 13] have succeeded, through population education, to record shorter consultation times, and therefore offer better management of their SCA ST + case. Work done in sub-Saharan Africa [6, 8, 10, 12] shows that the High blood pressure ranks first among the FDRs. We agree with these authors. In our study, hypertension (92%) was followed by dyslipidemia (44%) and then diabetes mellitus (32%). In North Africa, on the other hand, smoking ranks first in the FDR [14, 15]. In 62% of our patients, chest pain was infarctoid. Our data are comparable to those of South African authors at 58% [13]. Addad in Tunisia [15], Diao in Senegal [10] and Akoudad in Morocco [14] report significantly higher proportions of 79.7%, 88.1% and 95% respectively. The frequency of heart failure was comparable to that reported previously: 19.2% for Addad et al [15], 39% for Moses [13], but 3% for Akoudad [14]. The territory most often concerned by myocardial necrosis is anterior [8,18-20]. It was the same for 60% of our patients. Comparable rates were reported by Diao et al [10] and Akoudad et al [14], respectively 66% and 61%. Extrasystoles were noted in 12 of our patients. In the absence of ICUs for electrocardiographic monitoring, these results are probably underestimated. Other arrhythmias (atrial fibrillation, ventricular tachycardia and accelerated idioventricular rhythm) were not recorded for the same explanations. Thus, the six cases of syncope we have noted may have been related to a rapid, paroxysmal or complete atrioventricular block. The indicated ECG holter was not performed. Nevertheless, we recorded on a standard ECG 1 case of sustained TV. In our work, ACS were ST + in 26 cases (52%). In France [18] and Senegal [10], the respective rates were 35 and 89.8%. Like Diao et al in Dakar [10], we found abnormalities of parietal kinetics in the territories affected by myocardial necrosis. In contrast, our patients experienced more frequent left ventricular systolic dysfunction and relaxation disorder.

Medical treatment based on analgesics, blockers of the renin-angiotensin-aldosterone system, beta-blockers, anti-platelet aggregators, statins and anticoagulants is applied in Brazzaville. However, methods of recanalization, whether thrombolytic, angioplasty, and forturi coronary artery bypass are not available. This is a real handicap and makes it difficult to compare our data on this plan with other work. On the other hand, drugs such as: anti-platelet aggregates, beta-blockers, renin angiotensin aldosterone system blockers, statins have been used in proportions comparable to those of other African series [10, 14]. In (Table 3), we have indicated the frequency of occurrence of complications in some works, some of which have been able to resort to recanalization procedures [14, 15], and others not [10].

	Tunisie [15] n=203	Maroc [14] n=1835	Sénégal [10] n= 59	Notre travail n=50
Use of recanalization	yes	yes	No	No
Heartfailure	17	18	16.9	26
BAV	3	3.9	8.4	6
Cardiogenicshock	3.7	-	3.4	4
Ventriculartachycardia	4.2	3	3.4	2
Strokes	-	1.2	1.7	2
Hospitallethality%	7	7.6	15.2	26

**Table 3:** Frequency of complications in African work with or without coronary recanalization.

Lethality was significantly higher in the absence of a recanalization procedure. In contrast, the frequency of complete atrioventricular blocks and ventricular tachycardias was comparable. However in the evaluation of these two disorders, a bias related to the means of surveillance, could intervene.

## Conclusion

This is a preliminary work to draw the attention of the authorities to the urgency of the Acute coronary syndromes that are more and more common in sub-Saharan Africa. In Congo, the age of onset is young and the patients are poly factorial. High blood pressure remains the main risk factor. The consultation delay is constant. Chest pain is the main symptom at admission. Hemodynamic complications are the most common. Acute coronary syndromes with permanent ST segment elevation represent slightly more than half of the patients with a predilection in the former territory. Medical treatment excluding thrombolytic therapy was the therapeutic strategy employed. Dietary hygiene and the fight against risk factors have been recommended and must remain the priority in our context. The heavy hospital lethality is due to failure to perform thrombolysis or angioplasty.

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