Epidemiological, Clinical and Coronary Angiography Aspects of Acute Coronary Syndrome in the Cardiology Department of the Hospital Mother-Child "Le Luxembourg" Mali

Sidibé Samba[1,2,3]*, Toure Mamadou[1,3,4], Konate Massama[3,5], Sankaré Hamma[1], Traoré Ousmane[1], Mahamat Guire Sadik[1], Diall Mahan Ameri[1], Dicko Bahaide[2], Daffe Sanoussy[1], Keita Asmaou[2,3], Thiam Coumba Adiaratou[1,3], Diarra Soumaila[1], Menta Ichaka[3,4]

[1]Cardiology Department, CHU-Mère Enfant, Bamako, Mali
[2]Cardiology Department, CHU-Point G, Bamako, Mali
[3]Faculty of Medicine, University of Sciences, Techniques and Technologies of Bamako, Bamako, Mali
[4]Cardiology Department, CHU-Gabriel Touré, Bamako, Mali
[5]Cardiology Department, Mali Hospital, Bamako, Mali
Email: *sambakp@yahoo.fr

Abstract

Introduction: Cardiac catheterisation plays a fundamental role in the management of acute coronary syndrome. These explorations require heavy, complex and costly equipment and a large team of doctors, nurses and technicians with highly specialized training. **Aims**: To describe epidemiological, clinical and coronary angiography aspects of patients with acute coronary syndrome. **Patients and Methods**: Descriptive study from September 2019 to December 2023 in the Cardiology Department of the Hôpital Mère-Enfant of Bamako. Inclusion criteria were patients admitted for coronary angiography with the diagnosis of acute coronary syndrome. **Results**: During the study period, 1253 patients underwent coronary angiography, 596 of whom had acute coronary syndrome as an indication, representing a hospital frequency of 47%. Sex-ratio was 2.10. Mean age of patients was 58.5 ± 11.39 years. ST elevation acute coronary syndrome was the most common indication with 63.92% of cases. High blood pressure was the main cardiovascular risk factor with 58.7% of cases, and radial access approach was used in 98% of cases. Coronary angiography was pathological in 91.70% of cases (n = 548). Patients with lesions of anterior interventricular artery were 73.73% of cases. Tritruncal lesions accounted for 40.63% of cases. **Conclusion**: ST elevation acute coronary syndrome is the most frequent manifestation of acute coronary syndrome. Anterior interventricular artery is most often the culprit lesion for our patients.

1. Introduction

Coronary artery disease is multifactorial, and coronary angiography is the best test for diagnosing and assessing the severity of coronary lesions.

In Africa, coronary pathologies accounted for 15% of adult hospitalizations and 10% - 20% of hospital deaths. Acute coronary syndrome (ACS) [1] is the most severe form of coronary artery disease. The installation of a coronary angiography room in Mali in 2019 made it possible to optimize the management of ischemic heart disease.

Objectives of our study were to describe epidemiological, clinical and coronary angiographic aspects of patients admitted for acute coronary syndrome.

2. Patients and Methods

This was a descriptive study including the records of patients admitted for coronary angiography who had acute coronary syndrome as an indication. Patients were carried out from September 2019 to December 2023 in the interventional cardiology unit of cardiology department of the Mère-Enfant hospital from Bamako.

2.1. Inclusion Criteria

Computerized records of patients with acute coronary syndrome who underwent coronary angiography during study period.

2.2. Non-Inclusion Criteria

Patients seen in consultation or hospitalized in cardiology who had not undergone coronary angiography were not included in this study. Patients who hadn't acute coronary syndrome also weren't included in this study.

2.3. The Judgments Criteria

Patients presenting with symptoms related to acute coronary syndrome were included. ST elevation or non ST elevation acute coronary syndrome performs coronary angiography. Normal coronary angiography was defined by a coronary lesion less than 30%.

2.4. Methods and Data Collection

Samples were collected from the retrospective computer database in the interventionnal unit of cardiology department of "Mere enfant" Hospital. Parameters studied were sociodemographic, clinical, biological and coronary angiography data. Word and Excel 2013 were used for data entry, and SPSS 20 for data analy-

sis. Statistical test used was khi2 with a significance level of 5%.

3. Results

During the study period, 1253 patients underwent coronary angiography, 596 of whom had acute coronary syndrome as an indication, representing a hospital frequency of 47%. Sex-ratio M/F was 2.10. ST elevation acute coronary syndrome was the major indication for coronary angiography, accounting for 63.92% of cases. Mean age of patients was 58.5 ± 11.3 years with extremes of 21 and 92 years. Most affected age range was 41 to 60 years, with 51% of cases (Table 1).

The predominance of hypertension in the personal history was classic, at 58.70%. Diabetes and smoking were the most common cardiovascular risk factors, accounting for 43.50% and 25.5% of cases respectively (Table 2).

The main functional signs were chest pain (69.35%) dyspnea (58.47%) and palpitations (12.70%) (Table 3) associated with left heart failure syndrome in 67%.

Coronary angiography was normal for 8.05% and pathological for 91.95% of cases. Three vessel lesions accounted for the majority, in 40.63% (Figure 1). The interventricular artery was the culprit lesion for 49.7% (Figure 2(A)), followed by the right coronary with 27.6% (Figure 2(B)).

Left main coronary artery lesion was noted for 22 patients. Radial approach was used in 98%. Complications occurred in 4.5% of cases, and were mainly represented by punctur site hematoma. Coronary angioplasty was performed in 63.42% of cases, and coronary artery bypass grafting for 0.80%.

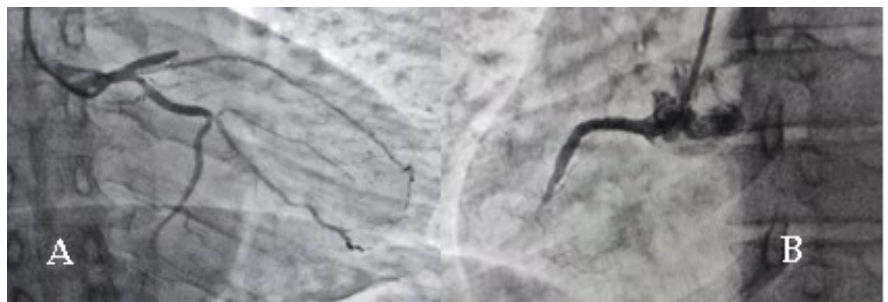Figure 1. Three vessel lesions.

Figure 2. (A) Occlusion of interventricular artery. (B) Occlusion of the right coronary artery.

Table 1. Patients distribution by age range and gender.

Age Gender	Range			Percentage
	18 - 40 years	41 - 60 years	≥61 years	
Women	12	88	95	32.72%
Man	25	216	160	67.28%
Total	37	304	255	100%

Table 2. Distribution of patients according to cardiovascular risk factors.

Cardiovascular risk factors	Number	Percentage
Hypertension	350	58.70
Diabetes	259	43.50
Smoking	152	25.50
Dyslipidemia	77	12.90
Obesity	70	11.70
History of coronary disease	30	5

Table 3. Distribution of patients by symptomatology.

Symptoms	Number	Percentage
Typical chest pain	344	69.35
Dyspnea	290	58.47
Palpitations	63	12.70
Recovered cardiac arrest	12	2.0

4. Discussion

The proportion of acute coronary syndrome among patients received in the coronary angiography room in our study was 47%. This is lower than the 3.17% found in the Coronafric study [2] [3]. This difference can be explained by the fact that our sample consisted exclusively of patients with acute coronary syndrome. The average age was 58 ± 11.39 years, and the age range was 41 - 60 years. This age is close to those reported by R N'Guette [4] and Paul Coffi Hessou in Senegal [5]. These results confirm that age constitutes a risk factor to be taken into account, particularly over the age of 40. Male gender predominated in our study, with a sex ratio of 2.1, in line with the literature [4] [5]. The predominance of arterial hypertension with personal history was classic with 58.7% in our series. Its pathogenic role is described in the literature [6] [7]. High blood pressure, diabetes and active smoking were the most common risk factors. This observation was noted in the Interheart Africa study [8], where these risk factors were incriminated in 89.2% of first episodes of myocardial infarction in sub-Saharan Africa. The growing magnitude of these cardiovascular risk factors

in our region explains the increase in the incidence of coronary heart disease. The clinical presentation in our series was dominated by coronary syndrome with ST segment (63.92%). Similar results were found in Kenya [9] and in the FAST-MI registry [10], but in lower proportions of 56% and 57% respectively. The interventricular artery was the culprit lesion at 49.7%, followed by the right coronary in 27.6%. The radial approach was mainly used in 98% in relation to the data in the literature making it possible to reduce the length of hospitalization and provides better comfort for the patient. The contrast product used in our series was omnipaque and the average dose was 32 ± 10.7 ml, less than Paul Coffi Hessou [5], who found an average contrast dose of 98 ml. Complications were noted in 4.5% of cases, mainly represented by haematomas at the puncture site. Three compartment hematomas, or 0.5% of cases, required surgical treatment with simple consequences. In our series, the coronary angiography was normal in 8.1% and pathological in 91.9% and the three trunk lesion was 40.63%. Treatment with coronary angioplasty was in 63.42% and coronary artery bypass grafting in 0.80% of cases. This low proportion of patients revascularized by angioplasty can be explained by the diagnostic delay, the patient's transport conditions and the financial difficulties of treatment.

5. Conclusion

Acute Coronary Syndrome ST (+) represents the most frequent manifestation of coronary artery disease. The most common risk factor is high blood pressure, diabetes and smoking and the anterior descending artery is the most common culprit.

Limitations of the Study

Low sample size; Insufficiency of cardiac catheterization room in Mali; The high cost of coronary angiography.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Authors/Task Force Members, Hamm, C.W., Bassand, J.P., Agewall, S., Bax, J., Boersma, E., *et al.* (2011) ESC Guidelines for the Management of Acute Coronary Syndromes in Patients Presenting without Persistent ST-Segment Elevation: The Task Force for the Management of Acute Coronary Syndromes (ACS) In Patients Presenting without Persistent ST-Segment Elevation of the European Society of Cardiology (ESC). *European Heart Journal*, **32**, 2999-3054. https://doi.org/10.1093/eurheartj/ehr236

[2] Coulibaly, S., Diall, I., Menta, I., Diakité, M., Ba, H., Diallo, N., *et al.* (2018) Le Syndrome Coronarien Aigu dans le Service de Cardiologie du CHU du Point G: Prévalence, Clinique, Thérapeutique et Évolution. *Health Sciences and Disease*, **19**, No. 3.

[3] Shavadia, J., Yonga, G. and Otieno, H. (2012) A Prospective Review of Acute Coronary Syndromes in an Urban Hospital in Sub-Saharan Africa. *Cardiovascular Journal of Africa,* **23**, 318-321. https://doi.org/10.5830/CVJA-2012-002

[4] Hanssen, M., Cottin, Y., Khalife, K., Hammer, L., Goldstein, P., Puymirat, E., *et al.* (2012) French Registry on Acute ST-Elevation and Non-ST-Elevation Myocardial Infarction. FAST-MI 2010. *Heart*, **98**, 699-705. https://doi.org/10.1136/heartjnl-2012-301700

[5] Steg, P.G., Goldberg, R.J., Gore, J.M., Fox, K.A., Eagle, K.A., Flather, M.D., *et al.* (2002) Baseline Characteristics, Management Practices, and In-Hospital Outcomes of Patients Hospitalized with Acute Coronary Syndromes in the Global Registry of Acute Coronary Events (GRACE). *American Journal of Cardiology*, **90**, 358-363. https://doi.org/10.1016/S0002-9149(02)02489-X

[6] N'Guette, R., *et al.* (2016) Prevalence and Characteristics of Acute Coronary Syndromes in a Sub-Saharan Africa Population. *Annales de Cardiologie et d'Angéiologie*, **65**, 59-63. https://doi.org/10.1016/j.ancard.2016.01.001

[7] Hessou, P.C., *et al.* (2021) Coronary Angiography: Indications, Results and Cost-Effectiveness in the Diagnosis of Stable Angina Pectoris in Two Hospitals in Senegal. *World Journal of Cardiovascular Diseases*, **11**, 347-356. https://doi.org/10.4236/wjcd.2021.118034

[8] Fatou, A.W., *et al.* (2020) Coronarographie et interventions chez des sujets de moins 40 ans au CHU Aristide le Dantec. *Journal Africain d'Imagerie Médicale*, **12**, 1-7.

[9] Toure, M., *et al.* (2023) Bilan des Trois Premières Années de Pratique de la Coronarographie au Mali. *Health Sciences and Disease*, **24**, 18-22.

[10] Steyn, K., Sliwa, K., Hawken, S., Commerford, P., Onen, C., Damasceno, A., *et al.* (2005) Risk Factors Associated with Myocardial Infarction in Africa: The Interheart Africa Study. *Circulation*, **112**, 3554-3561. https://doi.org/10.1161/CIRCULATIONAHA.105.563452