World Journal of Cardiovascular Diseases, 2024, 14, 288-294
https://www.scirp.org/journal/wjcd
ISSN Online: 2164-5337
ISSN Print: 2164-5329

Percutaneous Coronary Intervention in Acute Coronary Syndromes at the Mother-Child University Hospital Luxembourg in Bamako

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How to cite this paper: Toure, M., Sankare, H., Diarra, B.I., Dagnogo, M., Doumbia, M., Terra, A.W., Sidibe, S., Thiam, C.A., Sonfo, B., Diarra, B., Keita, A., Traore, O., Fofana, D., Diall, A.A., Sow, M., Konate, M., Ba, H.O. and Menta, I. (2024) Percutaneous Coronary Intervention in Acute Coronary Syndromes at the Mother-Child University Hospital Luxembourg in Bamako. *World Journal of Cardiovascular Diseases*, **14**, 288-294.
https://doi.org/10.4236/wjcd.2024.144023

Received: March 20, 2024
Accepted: April 25, 2024
Published: April 28, 2024

Abstract

Introduction: Acute coronary syndromes (ACS) are a diagnostic and therapeutic emergency. **Objective:** Studying the feasibility, difficulties and results of coronary angioplasty in acute coronary syndromes at the Luxembourg Mother-Child University Hospital in Bamako. **Patients and Methods:** Cross-sectional, descriptive study with prospective recruitment over 18 months from September 2020 to February 2022. All patients aged at least 18 years old admitted for SCA and having undergone PCI during the study period were included. **Result:** We collected 249 patients for SCA, of whom 160 underwent angioplasty, either an angioplasty/SCA ratio of 0.64. The average age of the patients was 59.54 ± 11.62 with extremes of 32 and 92 years. The age group of 45 to 65 years was the most representative. The predominance was male, sex ratio of 2.4. The main cardiovascular risk factors were high blood pressure (58.23%) and diabetes (45.78%). Persistent ST-segment elevation on the electrocardiogram was present in 71.48%. The treatment time was more than 12 hours after the first medical contact in 95.5%. The approach was radial in 96.5% of cases. Coronarography was pathological in 91.16% of our patients. The lesions were tri-truncular in 34.13% with the anterior inter ventricular as culprit artery in 72% of cases. The majority of patients (64%) had undergone angioplasty with implantation of an active stent. Angioplasty was performed successfully in 98% and per procedural mortality was 1.87%. Only 6.45% of ACS with ST elevation benefited from primary angioplasty. **Conclusion:** Per-

cutaneous coronary intervention is performed routinely in our center with satisfactory results. Difficulties exist, related to the diagnostic delay of ACS and the high cost of angioplasty.

Keywords

Acute Coronary Syndromes, Coronary Angiography, Angioplasty, Mother-Child University Hospital Luxembourg, Bamako, Mali

1. Introduction

Acute coronary syndromes (ACS) are a diagnostic and therapeutic emergency. They are becoming more and more common in developing countries because of the epidemiological transition [1] [2]. With globalization, urbanization, and lifestyle changes, we are now witnessing the emergence of cardiovascular risk factors including hypertension, diabetes, smoking and dyslipidemia [3]. This emergence of risk factors is correlated with the occurrence of ACS, the management of which remains a challenge in developing countries. Now in Mali, no data exist on percutaneous coronary intervention, which is the reference treatment for ACS, hence the initiative of this work. The objective of this work was to study the feasibility, difficulties and results of coronary angioplasty in acute coronary syndromes at the Mother-Child University Hospital Luxembourg in Bamako.

2. Patients and Methods

We carried out a cross-sectional, descriptive study with prospective recruitment over 18 months from September 2020 to February 2022. The interventional cardiology unit of the CHUME le Luxembourg in Bamako served as the setting for this study. We included all patients of both sexes, aged at least 18 years admitted for ACS and who underwent coronary angioplasty. ACS was defined by an acute context of myocardial ischemia associated with persistent ST-segment shift (STEMI) or no persistent ST-segment shift with or without ultrasensitive troponin elevation for NSTEMI. Data were collected from a survey sheet after informed consent of patients. The sociodemographic and clinical characteristics of patients, means of patient transport, delays between first medical contact and angioplasty, cost of interventional procedures, coronary angiography and angioplasty data were analyzed.

Data were entered using Word 2016 and analyzed by SPSS version 22.0. The statistical test used was the Fisher test and p was statistically significant if <0.05. Confidentiality was respected and data processing was anonymous.

3. Results

During the study period, we collected 160 patients out of 249 patients admitted for ACS, including 114 patients with STEMI or 71.25% and 46 patients with

NSTEMI (28.75%). The angioplasty/ACS ratio was 0.64. The mean age of patients was 59.54 ± 11.62 with extremes of 32 and 92 years. The 45 to 65 age group was the most representative. The predominance was male with a sex ratio of 2.7.

The main cardiovascular risk factors were high blood pressure (58.8%) and diabetes (46.9%), dyslipidemia and smoking were more common in STEMI (Table 1). All patients arrived at the hospital by personal means of transport (car or taxi). The time to treatment was greater than 12 hours after the first medical contact in 95.5% (Figure 1). The cost of coronary angiography was around 800 euros and 3200 euros for angioplasty with an active stent. The approach was radial in 96.5% of cases. The lesions were tri-truncular in 34.13% with anterior interventricular artery (IVA) as the culprit artery in 72% of cases (Table 2). The stents used were active in all of our patients. PCI was performed successfully in 98% and periprocedural mortality was 1.87%. Only 6.45% of SCAs with persistent ST lag benefited.

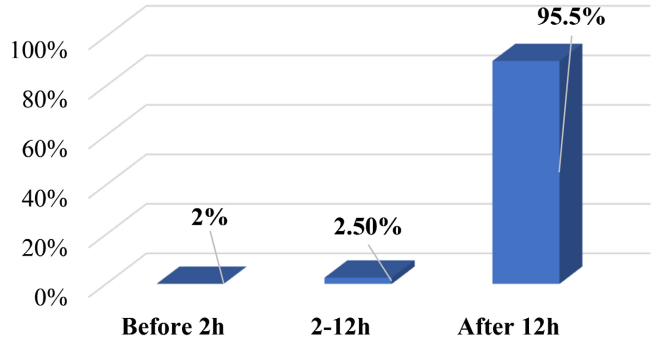

Figure 1. Time to first medical contact and angioplasty.

Table 1. Population characteristics.

Variables	Patients (N = 160)	%
Mean age (years) ± standard deviation	58.91 ± 10.93	
Sex		
Man	117	73
Wife	43	27
Cardiovascular history and risk Factors		
History of coronary artery disease	9	5.6
High blood pressure	94	58.8
Diabetes	75	46.9
Dyslipidemia	17	10.6
Smoking	54	25.5
Initial Presentation		
STEMI	114	71.2
NSTEMI	46	28.7

Table 2. Characteristics of coronary angiography and PCI.

Variables	Patients (N = 160)	%
Approach		
Radial	154	96.3
Femoral	6	3.7
Truncular status		
Mono truncular	42	26.3
Bi truncular	53	33.1
Truncular sorting	65	40.6
Culprit artery		
IVA	78	48.8
CX	38	23.8
CD	52	32.5
TCG	4	2.5
PCI results		
Success	157	98.1
Failure	3	1.8
Evolution		
Favorable	158	98.7
Death	3	1.8

4. Discussions

In our series, the predominance was male. It is correlated with the male predominance observed in the series of N'GUETTA in Abidjan [4], N'DAO and DIOUM in Dakar [5] [6].

All of our patients had arrived at the hospital by their own means of transport. This is due to the absence of an emergency medical aid service or any other pre-hospital medical transport structure. In the DIOUM series [6], 53.7% of patients had arrived at the hospital.

The cost of angioplasty was 3200, more expensive than N'GUETTA's 1829 euros in Abidjan [4].

Cardiovascular risk factors were dominated by high blood pressure (58.23%) followed by diabetes (45.78%) in ACS, dyslipidemia and smoking were more common in STEMI ($p < 0.05$). The same observation was made in the FASTMI registry in France [7], in the INTERHEART Africa study [8] and in the N'GUETTA series in Abidjan [4].

The clinical presentation was dominated by STEMI, the same observation was made by N'GUETTA in Abidjan [4] on the other hand for Puymirat in France [9] and Schamroth in South Africa [10] NSTEMI were dominant.

Angioplasty was performed radially in 96.5% of our patients. In the N'DAO and DIOUM series, the radial route was used in 87.5% and 55.6% of cases, respectively [5] [6]. The European Society of Cardiology, based on the RIVAL study [11], recommends the radial approach as the method of choice to reduce the incidence of bleeding complications of ACS in addition to being associated with a low mortality rate after infarction.

The culprit lesion was on the VIA in 72% of our patients. This observation can be superimposed on those of N'GUETTA [4] and N'DAO [5] which were respectively 53.2% and 60.7% for the IVA.

The time between the first medical contact and the performance of the angioplasty was more than 12 hours in 95.5% of our patients. The European Society of Cardiology recommends that the time between the first medical contact and the performance of the diagnostic primary angioplasty should not exceed 120 minutes in STEMI [12]. This long delay can be explained by the delays in diagnosis and referral of patients on the one hand and on the other hand by the lack of pre-hospital medical transport and the high cost of angioplasty, the same observation was made by N'GUETTA [4] in Abidjan.

PCI was successfully performed in 98% of our patients, this rate is comparable to those of N'GUETTA [4] and N'DAO [6] which were 97% and 96.4% but higher than the 91% of DIOUM [7].

The stents used were active stents in all our patients, but in the N'GUETTA series [4] the stents were bare in 91.6%. This large difference can be explained by the fact that active stents were not available in Africa at the time.

Peri-procedural mortality was 1.87%. In France and Abidjan, it was 0.9% and 1.2% respectively [4] [8]. On the other hand, it was 3.7% for DIOUM [7] in Dakar.

5. Conclusion

Percutaneous coronary intervention, especially primary angioplasty, is the treatment of choice for ACS. It is practiced in our center with satisfactory and encouraging results. We encounter some difficulties, related to the delay in diagnosis and referral of ACS but also to the high cost of angioplasty.

Limitations of the Study

Single-center study, small sample size, no-hiked study.

Conflicts of Interest

None.

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Abbreviations

ACS: Acute Coronary Syndrome
STEMI: ST Segment Elevation Myocardial Infarction
NSTEMI: No ST Segment Elevation Myocardial Infarction
PCI: Percutaneous Coronary Intervention