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Acute Coronary Syndromes in Niger: (West Africa): Epidemiological, Clinical, Para clinical and Therapeutic Aspects

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ABSTRACT

Introduction: Coronary artery disease is the leader in cardiovascular disease. An estimated 7.5 million deaths from cardiovascular disease are due to coronary heart disease. WHO estimates that by 2030, nearly 23.6 million people will die from cardiovascular disease? Over 80% of deaths attributed to cardiovascular disease occur in low- and middle-income developing countries.

The CORONAFRIC survey done in 1991 and which gathered 13 West African countries with 16 centers found a prevalence of coronary heart disease of 3, 17%. In Niger an over survey done in 2013 shows a prevalence of coronary heart disease at 5.60%. The main cause of coronary pathologies is atherosclerosis or atheroma and its sudden complication thrombosis. This review aims to study the local specificities of ACS through its epidemiological, clinical, Para clinical and therapeutic aspects at the level of the LAMORDE National Teaching Hospital (LNTH), in the absence of a cardiology technical platform intervention and in the absence of pre-hospital care, in order to formulate recommendations for the prevention of coronary artery diseases in low income countries.

Patients and Methods: This is a retro and prospective study over a period (July 01, 2014 to December 31, 2019) of 66 months and concerns cases of ACS hospitalized in the internal medicine and cardiology department of LNTH. Were included in our study patients with angina pain, and electrocardiographic signs (ischemia, lesion or necrosis) with or without a confirmed past history of MI but admitted with biological signs.

Results: At the end of our study, the prevalence of ACS is 10.67% compared to cardiovascular disease, CI 51.24%, stroke 26.24% and thromboembolic disease 2.84%. ACS is predominantly male in 63.77% of cases. The sex ratio is 1.76 -the age ≥50 years represents 86.98% of the subjects, with an average age of 60.98 years; -The months of November, December, January and February represent the favorable period for the onset of acute coronary syndromes with 23.20% of cases.

- Retro sternal chest pain is by far the most common symptom with 67.63% of cases. Troponin was measured in 75 of our patients, ie 36.23% of which 35.27% had a high level.

- ECG, troponin allowed us to identify forms of ACS with 70.05% of ACS ST +; 21.74% unstable angina and 8.21% Q- wave of MI.

- The most affected territory was anterior with 153 cases (73.91%) followed by the lower territory 46 cases (22.22%) then the lateral territory 16 cases (7.73%) associated.

In our study, hypertension was encountered in 34.48% of cases, diabetes (11.11%), hypercholesterolemia 4.35%), smoking (with 4.83%), obesity (with 2.90%), menopause (with 84.93%) were recognized as risk factors favoring the occurrence of ACS.

In 96.14% of the cases, the patients were put on aspirin and clopidogrel followed by the ICE in 93.24% of the cases; Beta blocking in 92.75% of cases; statin in 89.86% of cases; of diuretics in 55.56% of cases and heparin in 52.17% of cases.

In our study, 80.68% of our patients left hospital after clinical improvement. We have a high mortality rate of 19.32%. 80% of patients had HF as a complication, and conduction disorders are noted in 16% of cases and recurrence of pain in 8% of patients.

Keywords
ACS, Stemi, Nstemi, Angina unstable, Angina, Niamey Niger.

Introduction
Cardiovascular disease is a major global public health problem today. They are the cause of a quarter of the deaths recorded worldwide and therefore represent the leading cause of death in the world. It is estimated that in 2012, 17.5 million people died from it, i.e.30% of all deaths worldwide. It is estimated that 7.5 million of these deaths are due to coronary heart disease [1,2].

WHO estimates that by 2030, nearly 23.6 million people will die from cardiovascular disease [1]? Over 80% of deaths attributed to cardiovascular disease occur in low- and middle-income developing countries [1]. The term acute coronary syndromes (ACS) include all the clinical syndromes characterized by acute myocardial ischemia: unstable angina, myocardial infarction or sudden death [2].

The CORONAFRIC survey, which brought together 13 West African countries with 16 centers, found that their prevalence reached 3.17% of ischemic heart disease [3]. In Niger, a developing country where certain public health problems such as malnutrition, infectious diseases, pathologies of mother and child have not yet been resolved; diseases due to development are linked, making the health situation more precarious. Coronary diseases belonging to this latter group of pathology have only rarely been the subject of specific study. The prevalence of coronary heart disease was 5.60% in Niger in 2013 [4]. The coronary artery disease is the leading cardiovascular disease. This condition can manifest itself in several clinical entities: from silent ischemia to sudden death, including stable angina, heart failure and acute coronary syndromes. These include unstable angina and myocardial infarction [5,6]. The role of coronary artery occlusion in the occurrence of coronary artery disease and in this case acute coronary syndrome (ACS) has been known for several decades.

The main cause of coronary heart disease, atherosclerosis or Greek atheroma (Atheros) means mush and its sudden complication thrombosis, form the almost exclusive substratum of coronary diseases.

Atherosclerosis is an overload developed in the intima, slowly and gradually, localized especially in the first few centimeters of the coronary arteries (trunk lesions) forming lipid deposits (fatty acid and cholesterol) embedded in dense fibrosis. These plaques thicken, gradually narrow the arterial lumen and reduce the nourishing blood flow to the myocardium.

These lesions can become significant without causing clinical signs which only appear in the presence of very severe damage to the coronary network. These at the autopsy are rarely fresh but very often altered either by calcifications, or by ulcerations of the endothelium leaving bare the atheromatous slurry, or by a hemorrhage at the rupture of the numerous neo capillaries developed in the plaque, or especially supplemented by thrombosis.

They interest in order of decreasing frequency [7]
-The anterior inter ventricular artery.
-The right coronary, -the circumflex.

Multi trunk lesions in the same subject are frequent.

We group under the name of coronary syndrome the suggestive clinical events (anginal pain not responding to nitrates) [8]:
- Complete myocardial infarction (pain +, SCA ST +, Troponin +).
- Complete myocardial infarction (pain +, SCA ST-, but Troponin +).
- Unstable angina (pain +, normal ECG, normal biological marker but to be monitored over 24 hours).

The complications of coronary insufficiency depend on the number, the extent, the situation of the lesions of coronary atherosclerosis and the superadded thrombosis (all the more serious as they are close to the coronary ostium), of the type of the anatomical distribution of the network and of the richness of anastomotic collateral supply which is reinforced little by little during the long period of maturation of atherosclerotic stenosis.

After reviewing data from the literature and international recommendations, this work aims to study the local specificities of SCA through the study of its epidemiological, clinical, Para clinical and therapeutic aspects at the level of the LAMORDE National Teaching Hospital, in the absence of a cardiology technical platform intervention and in the absence of pre-hospital care, with the aim of formulating recommendations for the rigorous prevention of coronary pathologies.

Patients and methods
This is a retro and prospective study over a period (July 01, 2014 to December 31, 2019) of 66 months and concerns cases of ACS hospitalized in the internal medicine and cardiology department of LNTH.

Were included in our study patients with anginal pain, and electrocardiographic signs (ischemia, lesion or necrosis) with or without a confirmed history of MI and with or without the biological signs. Patients who did not present specific signs of coronary disease (especially the absence of ECG) were excluded from our study.

Data was analyzed using Epi-info 7 software and entered and processed from Microsoft office Excel 2013 and Microsoft office Word 2013.

Results
During our study period from 01 July 2014 to 30 December 2019, 9,800 patients were admitted to the internal medicine and cardiology department of LNTH, including 207 cases of ACS, i.e. a frequency of 2.11% compared to all hospitalizations during our study period. 1940 patients had been admitted to the internal medicine and cardiology department of LNTH for cardiovascular diseases, including 207 cases of ACS, i.e. a frequency of 10.67%.

The highest frequency of ACS among cardiovascular diseases was recorded in 2018 (58 cases or 14.46%) followed by that of 2019 (66 cases or 13.78%) the greater prevalence of SCA from heart disease was recorded in November and December with an average of 20.17% of the cases. We noticed that the 4th quarter (October-November-December) has the largest number of patients (86 cases or 41.54%) followed by the 1st quarter (January-February-March) which has 70 cases or 33.81% while the 2nd quarter has 28 cases or 13.56% and the 3rd quarter 23 cases or 11.11%.

Every month had patients suffering from coronary heart disease but the cold months (January; February; November; December) recorded more cases, successively (12.99; 12, 94%; 20.24%; 20.10 %) which makes an average of 16.56% or 132 cases compared to the dry period (April; May; June; July) which recorded fewer cases successively (8.18%; 6.42%; 7.21 %; 3.33%) which makes an average of 6.28% or 34 cases.

A predominance of male sex was represented with 132 cases (63.77%). The mean age of the patients was 60.98 years with extremes ranging from 23 to 90 years? 27.05% of the patients (or 56 cases) were aged between 70 and 79 years followed by that of 60 to 69 years (26.57% or 56 cases).

76.81% of the patients were between 50 - 79 years of age of which 52.17% were male.
20.29% of the patients were of the Zarma-Songhaï ethnicity.
14.01% of the patients were housewives followed by 12.56% farmers / breeders.
5.31% of coffee; 4.83% of tobacco and 1.45% of alcohol.
67.63% (140 cases) of patients complained of chest pain followed by 43% (89 cases) who presented dyspnea followed by oedema 24, 64% (51 cases) and cough 7.73% of cases (16 cases).

The ECG allowed us to make the diagnosis of both ischemia and cardiac necrosis. It also allowed us to determine the affected territory and any complications: conduction disorder 16%, cardiogenic shock 8%. 73.91% of cases the affected territory was anterior anatomically affecting the anterior interventricular artery (AIV); follow-up of the inferior territory in 22.22% of cases anatomically affecting the right coronary artery (PV). The lateral territory anatomically affecting the circumflex represents 7.73% of cases.

Simultaneous involvement of the anterior and lateral territory (IVA + circumflex) represents 0.48% of cases.
77.78% of patients had a regular sinus rhythm.
70.05% of patients had ST segment elevation on ECG.
In 29.95% of cases the Q wave of myocardial necrosis was present on the ECG.
In 23.67% of cases, the T wave was positive and negative in 18.84% of cases.
In our study, 27.05% of patients had dilated cardiomyopathy (DCM) with a reduced of LVEF in 29.32% of cases.
In 35.27% of cases the troponin was elevated, (11.59%) of our patients have hyperuricemia

- We note a hyper leukocytosis greater than 10,000 elements / mm3 in 36 of our patients, i.e. 17.39%.39 of our patients have a high CRP, i.e. 18.84%.
In 3.86% of cases, the LDL cholesterol level was high.

ACS ST + (STEMI) are the most common form with70.05%, and unstable angina (21.74%) and Q- wave MI (8.21%).
Hypertension affects 71 cases, i.e. 34.30% of our patients, of which 44 cases are male (70.42%) and 21 cases are female (29.58%).
Diabetes affects 23 cases, i.e. 11.11% of our patients, of which 12 cases (52.17%) are female and 11 cases are male (47.83%).

4.35% of patients had hypercholesterolemia. Only 6 of our patients have a BMI over 30 (or 2.90%), all of them are male. 10 of our patients are smokers (or 4.83%) all male 88 out of 207 patients (42.51%) have just one risk factor and 98 out of 207 patients (47.34%) have at least 2 cardiovascular risk factors. 21 patients have at least 3 cardiovascular risk factors (10.14%). The greater the number of risk factors is, the greater the risk of developing coronary artery disease is. Among the patients with a risk factor (42.51%), 28.5% were male and 14.01% were female. For patients with 2 risk factors (37.2%), 23.19% were male and 14.01% female.

In 96.14% of the cases, the patients were put on aspirin followed by the ICE in 93.24% of the cases; B blocking in 92.75% of cases; statin in 89.86% of cases; diuretics in 55.56% of cases and heparin in 52.17% of cases.

One hundred sixty-seven (167) of our patients were discharged after an improvement of their clinical condition, i.e. 80.68% of cases. The main complication found in our patients is HF. It is noted in 80% of our patients or 166 cases because of the lack of education and medical insurance covering they came at very late stages. 16% of cases have a rhythm disorder and 8% of patients have had a recurrence of pain.

Discussions and Comments
The prevalence of ACS compared to cardiovascular disease was 10.67 %. This prevalence is clearly higher than that found by CORONAFRIC [3] according to the results of the prospective multicenter survey on the epidemiological aspect of coronary heart disease in black Africans in 1991 in relation to 103 cases with a prevalence of 3.17%.

Our results are also shows an increasing rate in Niger compared to the study done in 2013 on which reported a prevalence of 5.6%.

BA. A. [14] mentions that the increase of the hospital prevalence of ACS in Dakar has more than doubled in 20 years (5% in 1988, 12% in 2008) during the XXI European SFC Days (Paris, January 12 to 15 2011).

Our results are lower than those of MARBOUH O. [15] in **2017** during the study on the Management of Acute Coronary Syndrome in the Center Kenitra Provincial Hospital in Morocco which reported a prevalence of 18.5% of ACS.

In Niger in less than 30 years, the prevalence has increased from 3.17% of cases in 1991 to 10.67% of cases in 2019.

In our study, 63.77% of patients are male versus 36.23% female, the sex ratio is 1.76.

These results are superior to those of Marbouh O. [15] who found 56.2% of the male subjects against 44.8% of the female sex.

This male predominance is corroborated by data in the literature, regardless of the region [18,19,20], because women are protected until menopause by estrogen hormones and most of them are none smokers.

In the CORONAFRIC survey [3], male predominance is noted in 81.5% of cases. SECK et al. [16] Found 77% of male cases. GOUDOTE YN [11] mentions 86% male, with a sex ratio of 7 in favor of men in his series at the main hospital in Dakar. KONIN and Coll [17] report a male predominance with 82% of cases in Abidjan.

The average age of our patients is 60.98 years (extremes of 23 to 90 years) with for the age group of 60 to 79 years the greatest number of patients (56 cases 27.05%) patient in 4. For the age groups of 60 to 79 years, men are the majority. On the other hand, the proportion of women is higher than that of men in the age group over 80 years. In our study, patients with an age greater than or equal to 50 years are the most numerous in 86, 95% of cases.

Touré AI et al [4] found during their work on the prevalence of acute coronary syndromes in Niger in 2013 that 79.31% were over 50 years old.

The CORONAFRIC survey [3] noted that 65% of patients were over 50 years old, and 11% were under 39 years old, the general average age was 63 years old.

SANCHEZ [18] in a survey carried out at the Dakar University Hospital discovers an average age of 56, 88 years (range from 38 to 73 years). SECK et al. [16] in a study made at the Principal Hospital of Dakar in 2007 report an average age of 59.4 years (range of 41 and 86 years). In Abidjan KONIN et al [17] mention 55.7 years (range 22 and 90 years). Coronary disease is increasingly being diagnosed in young people. In our series, 4.8% of patients are under 40 years old.

In a study carried out on young subjects under 35 years old (May 2001 - May 2005) in the service of BLIDA in Algeria Bouraghada MA and Bouafia MT [21] announced an average age of 30 years (range 22 and 35 years).

The cold months (November, December, January and February) are found with 16.56% of our patients compared to 6.28% for the hot period (April, May, June, July). The 1st trimester and the 4th trimester (cold period) are respectively 34.78% and 40% of cases.

Dangade I. [15] found 41.37 % on the 1st trimester. Boubacar DO [10] regained 31.25% in the 1st quarter.In Niger, Oumarou A. [22] who found during the cold season (January - February) 63.63% of cases of MI and the hot season (April- May) 36.36% of cases. Toure IA et al [23] they blamed the cold and dry season (December- March) and the hot and humid season (June-September) for the occurrence of cardiovascular disease including coronary disease.

Retro-sternal pain is the main symptom, found in 67.63% of our patients, followed by dyspnea 43%. 0edemas in 24.64% of cases, cough in 7.73% of cases.

In the series of TOURE IA and col l [4] 73.36% of the patients had retrosternal pain, then 50.57% of the patients had the dyspnea. Boubacar DO [10] in 2001 found 81.25% of patients with retrosternal pain, 40% had dyspnea.

Our results are close to that of marbouh o [15] in Morocco in 2017, who found chest pain in 63.5% of cases. Goudote Y. [11] found retro-sternal pain in 86% of cases in 2004 at L'Hôpital de Dakar. Just like Goudote, Seck and Coll [16] reported chest pain in 86% of cases. The anterior territory is more affected in our study with 73.91 %% of cases, followed by the lower localization with 22.22% of cases. Sanchez s. [18], confirms this topography with an anterior location in 64.7% of cases. Seck and Coll [16] found an anterior location in 58% of cases. Goudote Y. [11] mentions that the anterior territory is the most frequently encountered, noted in 55.5% of cases, followed by the lower localization (33% of cases). Coulibaly s and Coll. [24], find the same topography with an anterior location in 47.4% of cases and a lower location in 24.5% of cases. Toure IA and Coll [4], note the anterior localization in 57% of cases, followed by the inferior localization with 12.64%. Konin et al. [17] found the previous location in 74% of cases in Abidjan.

Troponin was measured in 75 of our patients, i.e. 35.97% of cases, of which 34.98% had a high troponin level. CPK-MB was also measured in 31 of our patients, i.e. 14.98% of cases. Our results are lower than those of Dangande I [13] which mentions that CPK-MB were measured in 36, 78% of cases. Troponin is elevated in 22.98% of his patients.

On the other hand, our results are superior to those of Goudote PY [21] and Gerard B. [25] who found troponin levels of 11.11% and 23.90% respectively.

17.39% of our patients have hyper leukocytosis which is superior to the result of Boubacar DO [10] which announces a rate of 9.37% of cases. On the other hand our results are lower than those of Dangante I. [13] which found a rate of 18.39%.

Echocardiography, 63.28% of our patients benefited from it, of which 19.32% had impaired left ventricular function; 27.05% dilated cardiomyopathy; 5.80% Global hypokinesia. This is close to the results of Goudote Y. [10] who reports that 70.58 % of

the cases in his study benefited from an ultrasound examination, among which 15.4% had an impaired left ventricular systolic function and 11.5% cases of dilated cardiomyopathy.

Sanchez S. [18] reports a 50% rate of impaired left ventricular function.

On the other hand, our results are superior to those of Dangande I. [12] who found that 4.60% of his patients who benefited from cardiac ultrasound, of which 2.30% had impaired ventricular function.

The clinic, the ECG and the enzymology allowed us to make the diagnosis of the different forms of ACS. Thus in our study we found 70.05% of SCA-ST +; 21.74% unstable angina and 8.21% Q-wave IDM. Our results are lower than those of Dangante I. [13] who found 83.91% of IDM ST +. Coulibaly S. et al [24] found a rate of 79% of MI and 21% of unstable angina. Our results are similar to those of Salifou S. [25] who found persistent ST segment elevation (SCA - ST +) in 70.7% of cases.

Hypertension is found in 34.30% of our patients with a sex ratio of 1.63 in favor of men. This result is similar to that announced by Dangade I. [13] which is 34.38% and close to the result of Konin and Coll [17] which is 37.5% of cases.

On the other hand, this rate is comparatively low compared to the different percentages found in other surveys.

Boubacar DO [10]. Note 83.4% of cases with a sex ratio of 2 in favor of the man. The CORONAFRIC survey [3] highlights 55, 3% hypertensive. Kingue and Coll. [20] found 60% of cases in Cameroon and Kimbally-Kaky G. ET Coll. [26] 53.3% in Congo Brazzaville. Goudote Y. [11] mentions a rate of 41.6% of cases. Seck et al. [16] report a figure of 46% of cases. In Mali, Diallo B. [28] reports a rate of 53.5% of cases. The major risk factor, hypertension is often overlooked in our regions.

In our study, 11.11% of our patients are diabetic with a sex ratio of 0.92 in favor of women. This rate is lower than that of Toure IA and Coll [12] who note a figure of 15% of cases. In the Sanchez survey, [18] 17.61% of patients are affected by this pathology. Diallo B. [28] found 18.6% of cases. Goudote Y. [11] reports a rate of 19.4% of cases. Konin et al. [17] report a rate of 25%. Coulibaly S. and Coll. [23] found 25.4%. It is objectified in 27% of cases during the Coronafric survey [3].

All the results contrast with the low rate observed by Kymbally - Kaky et al. [26] 5.4% of the cases, while Boubacar D.O. [10] and Thiam and Coll [29] report a rate of 37.5% and 40% respectively.

In our study, hypercholesterolemia was found in 3.38% of our patients with a sex ratio of 2 in favor of men, which is close to the results found by Coulibaly S. and Coll [24] 4.4% of case.

Our results are lower than those recorded by Stefano [29] as well as those of the Coronafric [3] survey with respectively 40.8% and 35.3%. A. I Toure. ET Coll [12] reported 13.79% hypercholesterolemia. In our study, it represents 2.90% of cases. Our results are similar to those of Toure AI ET Coll [12] which found 2.30%. This rate is very low compared to the figures announced by other studies. Goudote PY [11] reports a rate of 19.4% of cases. Kimbally- Kaky and Coll [27] find 23.9% obese, THIAM et al. [29] in Dakar notes a rate of 27% of cases. Coulibaly S. and Coll [24] in Bamako observed it in 15.4% of his patients. In the Coronafric survey [3], obesity is noted in 40.4% of cases. All the results are weak compared to 80% of the cases objectified by Kingue et al. [20].

The association of obesity with other risk factors is frequently observed, in particular hypertension, dyslipidemia and diabetes in coronary patients. Smoking is observed in 4.83% of our exclusively male patients. Unlike our study Toure IA and Coll [12] found 16.09% of cases. Coulibaly S. and Coll [23] found 35.1% of cases, Konin ET Coll. [17] objectify a rate of 39.5% of cases in Abidjan. Seck et al. [16] Report 40% of cases. Thiam and Coll [29]. Report a rate of 44% at the Main Hospital of Dakar. Sanchez [18] noted the presence of smoking in 47.05% of cases. Goudote YP [11] mentions a rate of 61% of cases. In the Coronafric survey, smoking is noted in 65.6% of cases [3]. In our series, 62 women are assumed to be postmenopausal out of 73, i.e. 84.93% of female cases. This result is similar to that of BA.

A [14] which announces a rate of 85% and Dangande I. [13] which finds 84%. Our results are superior to those of Goudote YP [11], which finds 3 out of 5 postmenopausal women, i.e. 60% of female cases. Diallo B. [27] reports a rate of 79.1% of cases.

The increased cardiovascular risk after menopause is related to estrogen deficiency. Sedentary lifestyle is a phenomenon responsible for the increase in atherogenic risk even if sedentary lifestyle is not an independent risk factor. Goudote Y. P. notes 28% of cases in his series at the Main Hospital of Dakar [11]. The Coronafric survey [3] shows in 41 to 92% of cases (depending on the criteria used) that low physical activity is a characteristic feature of coronary patients.

In our study 42, 51% of patients have at least one risk factor, 47.34% of patients have at least two cardiovascular risk factors and 10.14% of patients have at least 3 cardiovascular risk factors. Our results are different from those of Salifou S. [25] who found 73.17% of patients with more than 3 risk factors. According to the results of Coronafric [3] and Boubacar O. [10], the majority of patients had at least 3 risk factors with 65.6% and 70% respectively.

39.13% of our patients have cardiomegaly related to the state of arterial hypertension in which they are found. Dangante I. [13] reports a figure of 35.63%. Boubacar O. [10] reports a figure of 46.87%.

Creatinemia is elevated in 21% of patients, of which 10.01% of patients have hyper azotemia suggesting organic IR. Our results are superior to those of BOUBACAR O. [10] which found 18.75% of cases with an elevation of creatinemia among which 12.5% have hyper azotemia. On the other hand our results are lower than those of Dangante I. [13] who noted a high creatinemia in 25.29% of patients including 11.5% with a simultaneous increase in azotemia. 4.80% of our patients have higher than normal triglyceride levels.

Dangande I. [13] found 6.90% of cases. Boubacar DO [10] found 9.73% of cases. The management was standardized by the use of Aspirin in 96.14%; nitrates in 2.90% of cases; ACE inhibitors in 93.24% of patients; statins in 89.86% of cases; Beta blocker 92.75% Clopidogrel and LMWH were used in 74.88% of patients and Acenocumarol in 25.60% of patients.

This is in accordance with the literature [33], according to which the standard treatment of ischemic heart disease involves DNs, ACE inhibitors, antiplatelet agents, beta-blockers, heparin therapy.

Our results are close to those found by Dangade I. [13] where all the patients benefited from Aspirin, Plavix, nitro derivative, beta blocker and ACE inhibitor. Frederic B [31] found a frequency of use of 85.7% for Aspirin, 60.9% of LMWH, 17.7% of nitro derivative and 7.7% of the usual analgesic. For LUC [32] Aspirin is administered in 89.1%, statins 30%, IEC 59.2%; Beta-blocker 10.7%. Goudote PY [11] found that 24% of patients benefited from LMWH, 33% from beta blockers, 33% nitro derivative, 5.5% IEC and 19.2% from Thrombolytic. Nevertheless, no case of thrombolysis was performed in his study.

The main complication found in our patients is HF. It is noted in 80% of our patients our results are superior to those of Dangande I. [13] which found 34.48% of CI. In 2001, Boubacar DO [10] announced a rate of 51.12% of cases of HF. BA A. notes a rate of 20% of cases of HF in Dakar [14]. Coronary artery disease accounts for approximately 2% of the etiologies of heart failure in Africa according to the multicenter study (4500 patients with heart failure, 8 countries) reported by Mayosi (heart, 2007). Note that 16% of our patients have conduction disorders.

Our results are superior to those of Dangande I. [13] which found 12.64% of cases. On the other hand, our results are lower than those of Konin et al. [17] reports a rate of 21% of cases. 167 of our patients were discharged after improvement in their clinical condition, ie 80.68% of cases. These results are close to those of Boubacar D. O. [10] who notes the improvement in the condition of patients in 81.25%.

Dangande I. [15] found 88.51% of patients whose state of health was improved. In our study we recorded 19.32% as a death rate. This is higher than the rate found by DANGANDE I. [13] which is 11.49%. On the other hand, Boubacar DO [10] reports a mortality rate of 18.75%. Konin and Coll [17] found 20.6% of cases of death in Abidjan while the same authors in another study carried out over a period from 2001 to 2005 mentioned a mortality rate of 14% [33]. Thiam et al. [29] mention a rate of 13%.

On the other hand, in France, mortality, which was 12.1% in 1984, has halved in recent years; CAMBOU and Coll [56] found figures significantly lower than 7.7% in 1995 and 6.1% in 2000. As regards the prognosis [9], certain elements are immediately unfavorable in the hospital phase. It's about:
- On the clinical level: abortion, recurrence of MI, mechanical complication, unfavorable terrain (poly-pathological, high age…..), fever and prolonged inflammatory syndrome.
- On the electrical level: anterior site, significant and persistent shift in the ST segment, conductive disorders during anterior necrosis, bursts in VT during ECG monitoring.
- Biologically: significant rise in troponin.
- Ultrasound: hypokinesia of the remaining myocardium, left ventricular dilation.

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