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Management of Acute Coronary Syndromes in the Era of Interventional Cardiology in Togo

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Abstract

Background: Togolese cardiology has seen significant progress since 2019 with the installation of two interventional Cathlab. This work therefore has the general objective of evaluating the impact of this progress on the management of acute coronary syndromes in Togo. **Material and Method:** This was a multicenter descriptive and analytical cross-sectional study with retrospective data collection over a period of 4 years, extending from January 2021 to December 2023. It collected epidemiological, clinical, paraclinical, and evolving data on coronary acute syndrome (ACS) in 6 hospital centers spread across the Togolese territory (Sylvanus Olympio Teaching Hospital, Campus Teaching Hospital, Kara Teaching Hospital, Nadouvi Lawson-Body Hospital, Private Hospital Autel d'Elie, and Dogta-Lafiè Hospital). The data were analysed with EpiInfo software version 7.2.5.0. The search for mortality factors and comparison of characteristics of patients who were revascularized by percutaneous coronary intervention or not were performed using both univariate and multivariate logistic regression methods. The statistical significance threshold was $p < 0.05$. **Results:** The prevalence of ACS was 5.87%. The mean age was 58 ± 12.75 years with a male predominance (sex ratio (M/F) 1.60). The main cardiovascular risk factor was hypertension (46.86%). Health insurance was present in 12.13%. Chest pain was present in 90.38% of patients, with a mean time between the onset of chest pain and hospital admission of 61.18 ± 103.77 hours. The presentation of ACS was dominated by ACS with ST segment elevation in 64.02% with a predominant anterior location in 54.39% of cases. Coronary angiography was performed in 50.63% of patients and allowed the left anterior descending artery to be noted in 47.93 as the culprit artery. Among the patients who performed a coronary angiography, only 35.54% had undergone percutaneous coronary

intervention, including 23.52% primary percutaneous coronary intervention. The use of percutaneous coronary intervention was associated with many factors, including medical transportation methods, diabetes, heritability of coronary artery disease, typical chest pain, high heart rate, left anterior descending artery as culprit artery of ACS, and three-vessel coronary arterial disease. The evolution was marked by 11.72% deaths. Heart failure and cardiogenic shock were significantly associated with lethality. Percutaneous coronary intervention did not appear as a protective factor of death. **Conclusion:** Interventional cardiology procedures including coronary angiography and percutaneous coronary intervention are poorly practiced in acute coronary syndrome in Togo. Several obstacles block their adequate realization. These obstacles should be identified to promote this progress in the management of coronary heart disease in Togo.

Keywords

Acute Coronary Syndrome, Revascularization, Interventional Cardiology, Togo

1. Introduction

Acute coronary syndrome (ACS) is a set of clinical, electrical and/or biological manifestations associated with acute occlusion or sudden reduction in coronary blood flow more often by rupture of atherosclerotic plaque and whose main symptom is prolonged angina or recent worsening in a patient with or without coronary history [1]. Coronary heart disease is the leading cause of death worldwide [2]. In the United States of America, about 805,000 US citizens are reported to have ACS each year [3]. ACS is one of the leading causes of mortality in the Asia-Pacific region [4]. In Europe, coronary heart disease is the leading cause of death [5]. In France, ACS causes around 60,000 to 80,000 hospitalizations per year with high medium-term morbidity and mortality [6]. Progress in ACS management from the advent of thrombolysis to coronary angioplasty has reduced morbidity and mortality in ACS, justifying the various recommendations in this field for many years [7]-[9] and the last of which dates back to 2023 [1]. The progress of developing countries in interventional cardiac treatments and its influence on ACS management is known [10]. In Africa, the prevalence of ACS varies from 0.21% to 22.3% depending on the country [11]. In Togo, data on risk cardiovascular factors in the general population of Togo and in the hospital environment have been described [12]-[14]. The hospital prevalence in 2018 was 3.1% and the mortality rate was 10.5% [15]. The treatment was exclusively based on drugs without angioplasty, and coronary reperfusion was done using fibrinolytics in 14.6% [15]. Since 2019, Togo has seen an improvement in its plateau in the management of coronary heart disease with the installation of two interventional cardiology Cathlabs. This study aims to describe the characteristics of ACS in the era of percutaneous coronary intervention in Togo and to determine its impact on the mortality of ACS.

2. Material and Methods

This was a multicenter descriptive and analytical cross-sectional study with retrospective data collection from January 2021 to December 2023. It was carried out in cardiological centers in Togo, with a functional cardiological intensive care unit and/or an interventional cardiology Cathlab for the treatment of coronary heart disease. The centers selected were: the cardiology department of the Teaching Hospital of Sylvanus Olympio, the cardiology department of the Teaching Hospital of Campus, the cardiology department of the Teaching Hospital of Kara, the Nadouvi Lawson-Body Hospital, the Private Hospital Autel d'Elie and the cardiology department of the Dogta-Lafiè Hospital. These centers were selected because they are the main healthcare facilities for ACS in Togo, which receive patients from all localities of Togo. Pre-hospital care does not exist in Togo. Occasionally, the transport is medicalized and consists of an ambulance with no specific treatment for ACS. The study population was composed of patients aged over 18 years who were treated for ACS, including ST-segment elevation myocardial infarction, non ST-segment elevation myocardial infarction, and unstable angina pectoris who had been admitted to one of the study sites. We included in this study the records of consecutive patients admitted for ACS established by cardiologists based on patient history, physical examinations, initial electrocardiography (ECG), and cardiac markers. Specially ACS was diagnosed on a set of suggestive clinical manifestations such as chest pain or equivalent (dyspnea, epigastric pain or upper limb pain), associated with electrocardiographic changes and/or elevated troponin. Electrocardiographic changes was new ST segment elevation at the J-point in at least two contiguous leads, new bundle branch block, ST segment depression or T wave changes. Troponin I was the only one given. Incomplete records of ACS without medical observation (pain or no and its history) and electrocardiogram were excluded from the study. Data collection was done on a pre-established survey sheet from patient records. At each center, we searched the admissions records and identified patients admitted for ACS by comparing the records. From the inclusion and exclusion criteria, we selected the files that were the subject of the study. We then filled in the survey sheets from these files. The variables used for our study were : socio-demographic data (age, sex and profession of patients, their place of origin, modes of travel and time to visit compared with the onset of symptoms), cardiovascular risk factors, history and chronic pathologies, clinical aspects (reason for consultation, time between symptoms and admission, hemodynamic parameters such as blood pressure and heart failure at admission, paraclinical data (electrocardiogram, troponin I, lipid balance, blood glucose at admission and its control, glycated hemoglobin, cardiac doppler ultrasound and coronary angiography results), therapeutic aspects (different modalities of management at admission and during the hospitalization time, percutaneous coronary intervention, aorto-coronary bypass and medical treatment), the particularities of patients who have been revascularized by percutaneous coronary intervention and the evolutionary aspects (the different in-

tra-hospital evolutionary modalities mainly related to complications and risk factors of mortality). The diagnosis of heart failure in this study was based on clinical signs. Age was deemed a risk factor for cardiovascular disease after 50 years for men and 60 years for women. Hypertension was defined as a systolic blood pressure (BP) ≥ 140 mmHg or a diastolic BP ≥ 90 mmHg, or a documented medical history of antihypertensive treatment. Obesity was defined as body mass index (BMI) ≥ 30.0 kg/m^2. Diabetes mellitus was defined as two fasting blood glucose levels > 1.26 g/l and/or a documented medical history of diabetes or diabetes treatment. Threshold values for dyslipidemia are those of the National Cholesterol Education Program (NCEP) [16]. Tobacco smoking was deemed a risk factor when it was present or stopped within three years. Sedentary lifestyle was defined as the absence of daily physical activity or the presence of physical activity lasting less at 150 minutes per week. It also included no physical activity for at least 30 minutes per day. The heritability of coronary artery disease is defined as the presence of coronary artery disease in the patient's family. Data was entered and processed in Microsoft Excel 2019. The Epi Info 7.2.6.0 was used for statistical analysis. Qualitative variables were presented as number and percentage, and quantitative variables as mean ± standard deviation. The quantitative variables were compared by ANOVA. Qualitative and categorical variables were compared by the Chi-2 of Mantel-Haenszel or by the exact Fischer test for populations below 5. The search for mortality factors and comparison of characteristics of patients who were revascularized by percutaneous coronary intervention or not were performed by the logistic regression method univariate and then multivariate for characters with a level of significance less than or equal to 0.20 adjusted for sex and age. For each test, the value of $p < 0.05$ is considered significant. The anonymity of the survey sheets ensured confidentiality of the biomedical data of patients included in this study. This study has been approved by the ethics committee of Faculty of Health Sciences of the University of Lomé. Considering the retrospective nature of data, consent was not taken.

3. Results

3.1. Prevalence and Socio-Demographic Data

During the study period, we retained 239 acute coronary syndromes for a total of, 4072 hospitalized patients, with a prevalence of 5.87%. The mean age of patients was 58 ± 12.75 years old. The age group of [57-66] years was most represented (32.22%). We found 61.51% of men, a sex ratio (H/F) of 1.60. The occupations of patients were dominated by the private sector in 44.78% of cases. Among the patients, 29 or 12.13% had health insurance. Patients came directly from their homes in 60.67% and had used medical transport in 2.51% of cases.

3.2. Clinical Data

Hypertension was the cardiovascular risk factor found in 46.86% (**Figure 1**).

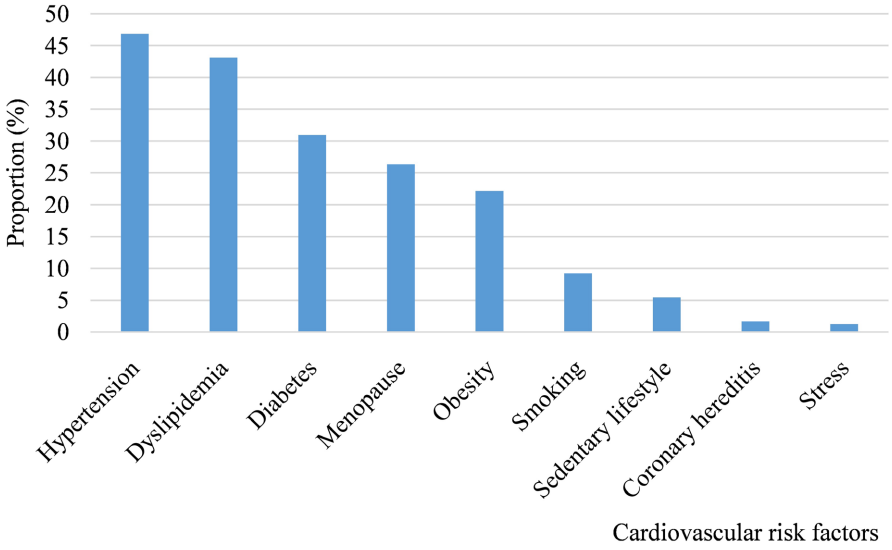

Figure 1. Distribution of patients by cardiovascular risk factors.

A history of myocardial infarction was found in 6.28% of patients. It was noted that 216 or 90.38% of patients had chest pain. Chest pain was described as anginal in 159 patients (73.11%). The mean time between onset of chest pain and admission to hospital was 61.18 ± 103.77 hours. The time for admission was less than or equal to 12 hours at 25.10%. The other symptoms were dyspnea at 19.67% and syncope at 0.42%. Blood pressure at admission was greater than or equal to 140/90 mmHg in 59 patients (24.69%). Arterial hypotension was found in 2.51% of patients. Heart failure was found in 47 patients, or 19.66%. From the point of view of Killip's classification, 79.50% of our patients reached stage I. Stage 3 or 4 of Killip was found in 18 patients (7.53%).

3.3. Paraclinical data

ACS with ST segment elevation were most found in 64.02% with the anterior location

Table 1. Patient distribution by type of Acute coronary syndrome and lesion topography.

	Number (n = 239)	Proportion (%)
ACS presentation		
ACS with ST segment elevation	153	64.02
ACS without ST segment elevation	86	35.98
Location of ACS		
Anterior	130	54.39
Inferior	37	15.48
Inferolateral	27	11.33
Undetermined	23	9.62
Circumferential	15	6.28
Lateral	07	2.93

ACS: Acute coronary syndrome.

most encountered in 54.36% (Table 1). An extension of the ACS to the right ventricle was found in 38 patients (15.90%). Heart rhythm disorder was recorded in 30 cases (12.55%) and conduction disorder was present in 12 cases (5.02%).

Troponin was measured in 201 patients (84.10%). It was positive in 194 (96.52%). The mean value of blood glucose at admission was 1.23 ± 0.78 g/l. The fasting glycemic control had found blood glucose greater than 1.10 g/l in 131 patients (59.28%). The lipid balance was obtained in 195 patients (81.51%). The mean value of LDL-cholesterol was 1.29 ± 0.54 g/l. LDL-cholesterol value was greater than or equal to 1 g/l in 66.15% of patients.

ACS without ST segment elevation with very high mortality risk was 10.47%. High-risk and low-risk ACS without ST segment elevation were 69.77% and 19.77% respectively.

Echocardiography was performed on 195 patients (81.59%). Table 2 shows the distribution of patients according to the main echocardiography anomalies. Pericarditis was minimal.

Table 2. Distribution of patients according to the main echocardiography anomalies.

	Number (n = 195)	Proportion (%)
Segmental contractility disorder	120	61.54
Left ventricular systolic dysfunction	60	25.10
Left atrium dilation	39	20.00
Left ventricular dilation	28	14.36
Mitral insufficiency	27	13.85
Pericardial effusion	18	9.23
Intracavitary thrombus	07	2.93
Moderate aortic insufficiency	02	1.03

Coronarography was performed in 121 patients, or 50.63%. Eight patients, 6.61%, had a coronary angiogram within 12 hours of the onset of chest pain. Coronary angiography was normal in 30 patients (24.79%). The main artery responsible for ACS was the left anterior descending artery in 47.93% of cases (Table 3).

Table 3. Distribution of patients by acute coronary syndrome culprit artery.

	Number (n = 121)	Proportion (%)
Left anterior descending artery	58	47.93
Right coronary artery	21	17.36
Circumflex artery	06	4.96
Marginale artery	03	2.48
Posterior interventricular artery	02	1.65
Left main	01	0.83

We found that 50 patients (54.94%) had one vessel coronary artery disease. Two and three-vessels diseases were found in 30.77% and 14.29%, respectively.

3.4. Treatment

Of the 153 cases of ACS with ST segment elevation, fibrinolytic treatment was administered to 33 patients, which is equivalent to 21.57%. Among them, 27 (81.82%) had been thrombolysed with streptokinase, 04 (12.12%) with intravenous tissue plasminogen activator and 02 (6.06%) with tenecteplase. Percutaneous coronary intervention was performed in 43 patients, 17.99% of ACS and 35.54% of patients who had a coronary angiography. This was the primary percutaneous coronary intervention in 08 patients (18.60% of percutaneous coronary intervention). Salicylic acetyl acid, clopidogrel or ticagrelor were prescribed in 96.23% and 67.36%, respectively. Heparins (unfractionated heparin or low molecular weight heparin) were prescribed to 85.77% of patients. Statins and beta-blockers were instituted in 96.23% and 79.92%, respectively. ACE inhibitors/angiotensin II receptor antagonists were instituted in 68.62%. Vasopressive amines and antiarrhythmic agents were prescribed to 9.21% and 8.37% respectively. Empagliflozin was prescribed to 5.44%. Insulin therapy was prescribed for 11.72% of patients. Two cases (0.84%) of temporary pacemaker placement were found.

3.5. Evolution and Factors of Intra-Hospital Mortality

The mean length of hospitalization was 5 ± 4.2 days. Sixteen deaths were recorded (6.69%). Among the patients who died, 6.25% had been revascularized by percutaneous coronary intervention. Apart from deaths, the main complications were hemodynamic (heart failure and cardiogenic shock) in 28.03% (Table 4).

The significant factors associated with death were heart failure and cardiogenic shock (Table 5).

Table 4. Distribution of patients according to the main intra-hospital complications.

	Number	Proportion (%)
Heart failure	49	20.50
Rhythm disorders	26	10.87
Cardiogenic shock	18	7.53
Death	16	6.69
Conduction disorder	12	5.02
Thromboembolic complications	07	2.93
Ischemic mitral insufficiency	02	0.84
Pericardial effusion	01	0.42

Table 5. Risk factors associated with death after multivariate analysis.

	OR	IC 95%	p
Age > 60	1.22	0.29~5.14	0.79

Continued

Male	0.67	0.16~2.85	0.58
Hospitalization center with CATHLAB	0.9	0.01~101.12	0.96
Hypertension	1.47	0.24~8.85	0.68
Diabetes	0.05	0.00~1.20	0.06
Dyslipidemia	0.97	0.12~8.21	0.98
Heart failure	**21.67**	**2.81~167.25**	**<0.01**
Cardiogenic shock	**14.64**	**2.75~77.80**	**<0.01**
Intake heart rate>80bpm	0.64	0.06~6.69	0.71
Left ventricular systolic dysfunction	5.10	0.62~41.87	0.13
Rhythm disorder	2.67	0.58~12.27	0.21
Fibrinolysis	0.28	0.02~3.32	0.31
Percutaneous coronary intervention	0.68	0.03~15.54	0.81

3.6. Characteristics of Patients Revascularized and Not Revascularized by Percutaneous Coronary Intervention

The characteristics of revascularized patients were significant in the mode of medical transport, diabetes, coronary heredity, typical chest pain, heart rate at admission, anterior interventricular artery as the culprit artery and the tritroncular character of the lesions (Table 6).

Table 6. Characteristics of patients revascularized by percutaneous coronary intervention compared to those not revascularized after multivariate analysis.

	OR	IC 95%	p
Age > 60	0.85	0.29~2.51	0.77
Male gender	2.27	0.37~13.78	0.37
Presence of health insurance	2.48	0.65~9.43	0.18
Medical transport	**34.55**	**2.50~477.57**	**0.01**
Hospitalization in hospital with CATHLAB	3.72	0.88~15.76	0.07
Hypertension	0.51	0.14~1.90	0.32
Diabetes	**4.58**	**1.37~15.33**	**0.01**
Menopause	0.66	0.07~6.17	0.72
Stress	3.07	0.03~337.47	0.64
Typical chest pain	**12.66**	**2.02~79.44**	**0.01**
Delay chest pain-admission < 12 hours	2.72	0.69~10.77	0.15
Intake heart rate > 80 bpm	**0.24**	**0.07~0.88**	**0.03**
Coronary acute syndrome with ST elevation	1.80	0.27~11.95	0.54
Coronary acute syndrome without ST elevation high risk	0.15	0.02~1.35	0.09
Left ventricular systolic dysfunction	0.31	0.08~1.18	0.09

Continued

Left anterior descending artery culprit	**7.29**	**2.09~25.38**	**<0.01**
Three-vessel coronary artery disease	**12.27**	**1.64~91.84**	**0.01**
Fibrinolysis	0.93	0.22~3.99	0.93
Death	0.17	0.01~5.41	0.32

4. Discussion

We conducted a cross-sectional, descriptive and analytical study with retrospective data collection from January 2021 to December 2023. The multicentric nature of this study allowed us to take a global photograph of ACS in Togo. We were able to highlight the epidemiological, clinical and paraclinical characteristics, the different modalities of management of acute coronary syndrome in cardiological environment in Togo.

We found a prevalence of 5.87%. Our result was similar to the results reported by various authors in the subregion [17]-[19]. By contrast, N'guetta and Yao in the Ivory Coast reported higher prevalence rates [20] [21], of 13.5% and 14.9%, respectively. This could be explained by the fact that the center of their studies was the first to offer percutaneous coronary intervention in the Ivory Coast and West Africa region for several years.

Chest pain was the main symptom in 90.98% of patients. This was in line with the results of Ali, Mboup and Coulibaly with respectively 81.25%, 79.7%, 91.2% [17] [22] [23]. This chest pain was described as typical in 73.11% of our patients which was similar to the results of Mboup in Senegal (79.7%) and Belle in France who found 80% of typical chest pain [22] [24]. In contrast, Rakotonirinarisoa in Madagascar found only 7.7% of typical chest pain and linked this low rate to the advanced age and sedentary nature of the patients in this study [25]. The average time between onset of symptoms and admission to hospital was 61.18 ± 103.77 hours, longer than that of Mboup *et al.* which was 30.7 hours [22]. Pitsavos reported an average delay of 4 hours [26]. Overall, the time to admission was < 12 hours for only 25.94% of our patients which was like the results of Millogo, Ali, and Coulibaly [17] [18] [23]. In France, Cambou found that 63% of the patients in his study arrived within 6 hours [27]. These results highlight once again how late the treatment of patients with ACS in our region remains compared to European countries.

Nineteen decimal sixty-six percent of the patients in our work have arrived in a heart failure chart. Our results were comparable to, Ali *et al.* [17]. From the point of view of Killip's classification, 79.50% of our patients reached stage I which was comparable to the result of Cambou [27]. This result is rather interesting because it allows us to see that despite the frequency of delays in treatment due to the long period of admission to the hospital, patients do not arrive immediately with complications such as hemodynamic complications.

In our study, ACS with ST segment elevation were more frequent than ACS

without ST segment elevation at 64.02% and 35.98%, respectively. These results are similar to those found by Ali, N'guetta, Pessinaba and Yao who had 59%, 75.1%, 71.6%, 60% [15] [17] [20] [28]. However, these results were in contradiction with those reported in the western series, where ACS without ST segment elevation appeared to be more frequent. Artigou in France reported that the prevalence of ACS without ST segment elevation was higher than ACS with ST segment elevation, and Belle and Fox had found 51% and 76% of ACS without ST segment elevation respectively [6] [24] [29]. The difference could be explained by the fact that in ACS with ST segment elevation diagnosis is easy, and especially electrical complications are more frequent, so patients consult or are referred to more frequently centers of care. In ACS without ST segment elevation, the diagnosis seems less easy and is very little done. Patients are therefore more rarely sent to referral centers in our country, whereas in Europe, any chest pain justifies a visit to the emergency room and the diagnosis of ACS without ST segment elevation is made more often.

Coronarography started in 2019 in Togo. It has become a diagnostic tool of choice for acute coronary syndromes. Its cost remains high, and neither coronarography nor percutaneous coronary intervention are not covered by Universal Health Insurance. This coverage remains the privilege of a few private insurance companies. As a result, the average Togolese can hardly afford to pay for this review. Nevertheless, efforts are made both by the doctors who try to explain the merits of this examination to patients and by the patients themselves. Pre-hospital care does not exist in Togo. Patient transport (motorbike, tricycle, personal car) is commonly used for hospital transfers. Thus, over the period of our study, coronary angiography was performed in 50.63% of patients. It was shown that the majority (47.93%) of the lesions were on the left anterior descending artery. This was in line with the predominance of previous electrical topography in our work. This was comparable to the results of Ndao *et al.* in Senegal, which also found a predominance of left anterior descending artery lesions [30]. The most common type of impairment was one vessel coronary artery disease (41.32%), a different result from that reported by Ndao, who had more two vessel coronary artery disease [30].

The goal of treatment in ACS is to revascularize the patient as quickly as possible. Of the 153 patients with ACS with ST segment elevation, 33 or 21.57% had received fibrinolytic treatment. Our result was higher than those of Coulibaly, Ali, Millogo [17] [18] [23]. It is above all higher than that obtained by Pessinaba *et al.* in 2018 in Togo, which had recovered 14.6% of thrombolysed patients [15], indicating a certain progression in the management of patients. Our result was also higher than that of Belle in France and Rochemont in Guyana [24] [31] but this is explained by the fact that in these countries percutaneous coronary intervention is preferred over that by thrombolysis since all the conditions are met to do so. Forty-three patients, or 35.54% of the patients who had a coronary angiography, had undergone percutaneous coronary intervention. Compared to Belle's results, this figure was low (97% for Belle) [24] but still encouraging given the conditions

in our environment. Only 18.60% of the cases had primary percutaneous coronary intervention performed. This was higher than the 2022 figure of 5.5% for Yao *et al.* [21]. Kebede and Belle reported higher rates of 24.55% and 71% respectively [24] [32]. These differences would be due not only to the long period of admission of patients in our context, but also to the financial difficulties that they may face to meet this cost in the absence of health insurance. It is therefore worth pointing out the importance of raising awareness among populations to consult early on in case of chest pain, but also the importance that universal health insurance is really for everyone and can support both coronarography and percutaneous coronary intervention. Thus, the management of patients with ACS can be more effective.

We recorded 16 (6.69%) deaths during hospitalization. Our rate was high but still lower than that recorded by Pessinaba *et al.* in 2018, which represents a major and encouraging reduction. It was also lower than the rates reported in several African studies [18] [20] [32]. However, we consider that there is still a lot of effort to be made to reach the European standards where hospital lethality is now below 3% [24] [33].

Heart failure and cardiogenic shock, which are complications recognized as poor prognosis [6], were significantly associated with death in our patients, consistent with the results of several studies [34]-[36]. In our study, Fibrinolytic treatment and percutaneous coronary intervention did not appear as protective factors of death, contrary to what is described in the literature [1] [28] [36]. Monitoring patients' adherence to treatment was conducted. Pre-hospital care for every patient, care that is not available in Togo should be used to influence mortality. This is explained by the insufficient proportion of people who have benefited from these treatments. The non-protection of percutaneous coronary intervention in this study could be caused by factors such as the criteria for percutaneous coronary intervention in these patients, no inter-hospital transfers correct protocols, late or complicated infarction, and financial constraints.

Compared to patients who were not revascularized by percutaneous coronary intervention, the revascularized patients had used a medically assisted mode of transport more often, which could be explained by the fact that the revascularized patients were those who had the financial resources to pay for this management and were therefore better able to pay for medical transport. Percutaneous coronary intervention was statistically associated with diabetes, which is consistent with the fact that ACS is one of the most common complications in diabetics. As a result, patients are more often subjected to coronary examination and possibly percutaneous coronary intervention [37]. Typical chest pain was significantly associated with Percutaneous coronary intervention, which could be explained by the fact that the characteristics of the pain would lead patients to consult more often and especially very early, than in case of atypical pain, the diagnosis would therefore be established early and management up to the angioplasty stage would be carried out more often. Percutaneous coronary intervention was performed preferentially on the anterior interventricular artery because it is the most frequently guilty artery of ACS in our

results. Also, there was more percutaneous coronary intervention in patients with three-vessel coronary artery disease. This finding may be related to the fact that patients with diabetes frequently have three-vessel coronary artery disease [38] [39], and that percutaneous coronary intervention in our study was significantly associated with diabetes. Offering specific, actionable recommendations for improving access to and quality of interventional cardiology services in Togo would be appreciated. These could include strategies for improving pre-hospital care, streamlining referral processes, training healthcare professionals, and advocating for enhanced insurance coverage for interventional procedures.

5. Conclusion

At the end of this four-year cross-sectional study on epidemiological, clinical, paraclinical and progressive characteristics of acute coronary syndromes in the era of interventional cardiology in Togo, the prevalence of ACS is increasing. The affected subjects are relatively young, with a male predominance. High blood pressure was the main cardiovascular risk factor. Chest pain was the main symptom, and the average time to admission was long. The presentation of SCA was dominated by acute coronary syndrome with ST segment elevation with a predominant previous location. The rate of completion of coronary angiography was low. Percutaneous coronary intervention was poorly performed and often in acute coronary syndrome with ST segment elevation. Very few primary percutaneous coronary interventions were performed, and most often, they were performed after fibrinolysis. Despite these myocardial revascularization techniques, the lethality rate in ACS remains high and percutaneous coronary intervention has not appeared as a protective factor. The particularities of patients undergoing percutaneous coronary intervention show many deficiencies that do not allow for better value of this technique. Other studies on the factors of poor prognosis in patients revascularized should enable the correct evaluation of this new technique that is gradually being installed in the cardiological practice of Togo. In addition, the evaluation of the different barriers to the performance of primary angioplasty should be carried out by a study to correct them.

Ethics Approval and Consent to Participate

This study was approved by the **Ethics committee of the Faculty of Health Sciences of the University of Lome**, and data was processed anonymously. In view of the retrospective nature of data, consent was not taken.

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Authors' Contributions

Afassinou YM, Abdou S and Pessinaba S designed and developed the research.

Kaziga WDD, Atta B, Kpélafia M, Anifrani T collected samples. Afassinou YM, Abdou S, Pio M, Baragou S and Damorou F carried out sample analysis and statistical analysis. Afassinou YM and Abdou S drafted the manuscript. All authors contributed to the article and approved the submitted version.

Data Availability Statement

The datasets generated and analysed during the current study are not publicly available but are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no competing interests.

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