

Mortality in Cardiology in Sub-Saharan Africa: Case of the Cardiology Department of the Teaching Hospital Sylvanus Olympio of Lome

Afassinou Yaovi Mignazonzon^{1*}, Dola Kossi Edem¹, Pessinaba Soulemane², Atta Borgatia³, Pio Machihude⁴, Baragou Soodougoua¹, Damorou Findibe²

¹Cardiology Department, Sylvanus Olympio Teaching Hospital of Lome, Lome, Togo

²Cardiology Department, Teaching Hospital Campus of Lome, Lome, Togo

³Medical Department, Sokode Regional Hospital Center, Sokode, Togo

⁴Cardiology Department, Kara Teaching Hospital, Kara, Togo

Email: *togbericardo@yahoo.fr

How to cite this paper: Mignazonzon, A.Y., Edem, D.K., Soulemane, P., Borgatia, A., Machihude, P., Soodougoua, B. and Findibe, D. (2023) Mortality in Cardiology in Sub-Saharan Africa: Case of the Cardiology Department of the Teaching Hospital Sylvanus Olympio of Lome. *World Journal of Cardiovascular Diseases*, 13, 477-492. <https://doi.org/10.4236/wjcd.2023.138042>

Received: June 4, 2023

Accepted: August 7, 2023

Published: August 10, 2023

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Abstract

Background: Cardiovascular disease is the leading cause of death worldwide. The specificities of cardiology mortality in Togo are not well known. The objective of this study was to determine the profile of deaths in the cardiology department of the Sylvanus Olympio Teaching Hospital (CHU SO) in Lome. **Materials and Methods:** This was a cross-sectional study conducted over a period of 06 years, from January 1, 2015 to December 31, 2021, in the cardiology department of the Sylvanus Olympio Teaching Hospital in Lome. In this study, we included all medical records of patients who died in hospital in the cardiology department during the study period. **Results:** During the study period, 2762 patients were hospitalized in the cardiology unit at CHU SO. We recorded 112 deaths meeting our criteria, for an intrahospital mortality rate of 4.19%. The average age of patients was 53.79 ± 18.27 years. Hypertension was present in 47.3%. Sickness insurance coverage was not available for 94.64% of those who died. The major cardiovascular diseases observed were myocardium in 43.75% whose dilated cardiomyopathy accounted for 71.42%; and rhythmic lesions in 34.82%. Biological infectious syndrome (56.25%), renal failure (48.21%), anemia (47.27%), lung infection (32.14%), hyponatremia (33.04%) were the main comorbidities observed. Among the circumstances of death, sudden death was found in 32.14%, cardiogenic shock in 20.54% and septic shock in 13.39%. **Conclusion:** The profile of deaths in the cardiology department of the CHU SO reveals that myocardial injuries are more present with circumstances of death dominated by sudden death.

Keywords

Mortality Rate, Cardiology, CHU Sylvanus Olympio

1. Introduction

Cardiovascular disease (CVD) is the leading cause of death worldwide, and the burden of cardiovascular disease has continued to increase for decades for almost all countries outside high-income countries. The age-standardized rate of cardiovascular disease has begun to rise in some places where it has previously declined in high-income countries [1]. The World Health Organization (WHO) estimated the number of cardiovascular-related deaths worldwide in 2008 at 17.3 million, which is expected to reach 23.6 million by 2030 [2] [3]. Between 1990 and 2001, of all deaths in low- and middle-income countries, CVD deaths decreased from 26% to 28%, reflecting a rapid epidemiological transition [3]. The epidemiological transition, with the ageing of the population, urbanization and new dietary behaviours, cardiovascular diseases have taken precedence over infectious diseases in the least developed countries of sub-Saharan Africa, South-East Asia and South America. In these regions, mortality from cardiovascular disease accounts for more than 20% of overall mortality and the prevalence rate of coronary heart disease and stroke is linked to infectious and nutritional diseases. [4]. In sub-Saharan Africa, the weight of CVD contributes to lower life expectancy in the population [5] [6]. In Togo, cardiovascular emergencies accounted for 18% of hospitalizations at the Campus Teaching Hospital in Lomé in 2008 and were responsible for 17.1% of deaths [7]. The effects of CVD on hospital morbidity and mortality in cardiac departments increased between 2006 and 2010 [8]. Despite this data, studies about the specificities of cardiovascular mortality are rare in Togo. Thus, in order to improve the management of cardiovascular diseases in our country, We carried out this work, which aimed to determine the profile of cardiovascular disease deaths in the cardiology department of the Sylvanus Olympio Teaching Hospital (CHU SO) in Lomé.

2. Material and Methods

It was a cross-sectional study conducted over a period of 06 years, from 1 January 2015 to 31 December 2021, in the cardiology department of the Sylvanus Olympio Teaching Hospital of Lomé. The study population consisted of medical records of patients hospitalized in the Cardiology Unit of CHU SO during the study period. In this study, we included all records of patients who died in hospital in the cardiology department during the study period. Records of deceased patients from other departments but housed in cardiology for lack of space were not included. Records of patients initially hospitalized in the cardiology department and then transferred to another department except intensive care unit

(Covid 19 patients transferred to the Regional Hospital of Lome Commune, patients with neoplasia, stroke without heart cause, heart disease with urgent pathology of another specialty) and records of deaths at home after hospitalization in the cardiology department were not included.

The data collection was carried out using a pre-established data sheet. The death census began with the analysis of the department's medical records and the identification of patients who died in the department. The patient files were subsequently retrieved from the archives and those meeting our criteria were recorded on the survey sheets. Using a predetermined datasheet, we gathered and studied socio-demographic data (age, gender, occupation, health insurance), clinical examination data (reason and mode of admission, personal history, the results of the initial physical examination), recovered cardiovascular pathologies and comorbidities, therapeutic data and evolution.

The classification of pathologies used was the tenth review of the international classification of diseases [9]. No deaths in the department were autopsied.

We used EPIINFO 3.5.4 for statistical analysis of the data. Quantitative variables are presented as average standard deviations of varying degrees. Qualitative and categorical variables are in numbers and percentages.

Approval from the CHU SO was obtained for this study and the data was anonymously processed.

3. Results

3.1. Sociodemographic Data

During the study period, 2762 patients were hospitalized in the CHU SO cardiology unit. We recorded 120 deaths in this unit, 112 of which met our criteria, representing an intrahospital mortality of 4.19%. The number of females and males was the same, with a gender ratio of 1. The average age of patients was 53.79 ± 18.27 years. Deaths were less than 60 years old in 56.93% of cases (Figure 1). Sickness insurance coverage was not available in 106 patients, or 94.64%.

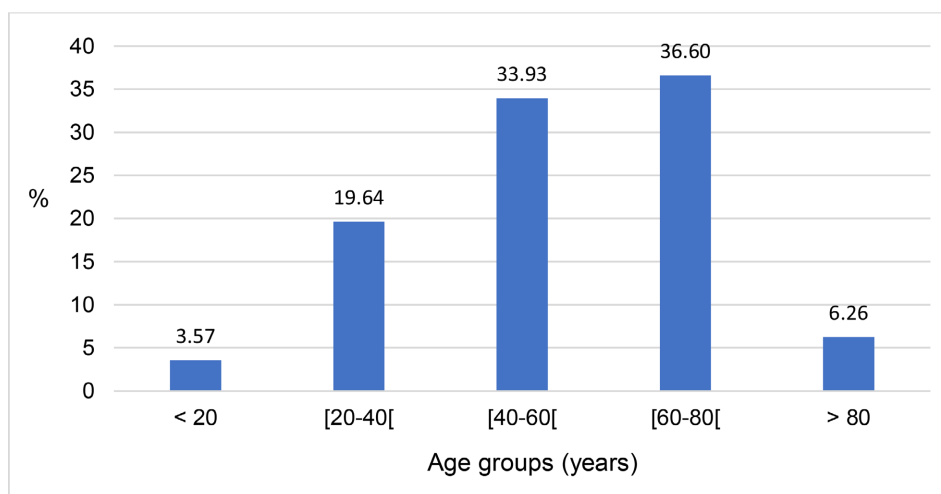


Figure 1. Distribution of deceased patients by age groups.

3.2. Clinical Data

Dyspnea was identified in 77.68% of cases as an admission reason (**Table 1**).

Two admission modes in the cardiology department of CHU SO were found with transfers/references in 84.82% and direct admissions to the service accounted for 15.18%.

Hypertension was found in 47.32% as cardiovascular risk factors. A history of heart disease was present in 40.17% followed by chronic heart failure in 36.60% (**Table 2**).

Table 1. Distribution of deceased patients by reasons of admission.

	n	%
Dyspnea	87	77.68
lower limb edema	37	33.04
Chest pain	17	15.18
Asthenia	6	5.36
Palpitations	4	3.57
Syncope	3	2.65
Hemoptysis	1	0.89
Fever	1	0.89

Table 2. Distribution of deceased patients by cardiovascular risk factors and personal medical history.

	n	%
Hypertension	53	47.32
Dyslipidemia	26	23.21
Menopause	34	30.36
Tobacco	10	8.93
Diabetes	9	8.04
Chronic heart disease	45	40.17
Chronic heart failure	41	36.60
Consumption of herbal tea	17	15.18
Alcohol consumption	16	14.29
Atrial fibrillation	9	8.04
Cancer	9	8.04
Stroke	5	4.46
Venous thromboembolic disease	5	4.46
Human immunodeficiency virus infection	4	3.57
Thyroid dysfunction	4	3.57
Chronic kidney disease	4	3.57
Asthma	3	2.68
Sickle cell anemia	3	2.68

Heart failure was found in 75 patients (66.96%) on physical examination. Atmospheric desaturation was observed in 51 patients (45.54%). Shock and altered consciousness were found in 12.50% and 6.25% respectively.

3.3. Cardiovascular Conditions

Myocardial pathologies and rhythm and conduction abnormalities were found in 43.75% and 34.82% respectively. Thirteen cases (11.61%) of coronary artery disease and 4 cases (03.58%) of congenital cardiac disease were also identified (Figure 2).

Among myocardial pathologies, dilated cardiomyopathy was found in 71.42% of cases. Acute coronary syndrome with ST elevation was found in 46.15% of patients who died of coronary disease (Table 3).

3.4. Comorbidities

Pulmonary infection and biological inflammatory syndrome were co-morbid in 32.14% and 56.25% respectively (Table 4).

3.5. Therapeutic Aspects and Evolution

Anticoagulants were used in 80.36%, followed by diuretics in 62.5%. Inotropics supports (dobutamine and dopamine) were used in 70.53%. Fluid pericardial evacuation in the form of a puncture or pericardial drainage was performed in 04 patients (3.57%). (Table 5). No circulatory assistance or heart transplant was performed.

The average duration of hospitalization was 6.87 ± 8.71 days. Deaths occurred before a week of hospitalization in 67.86% of patients. Sudden death was found

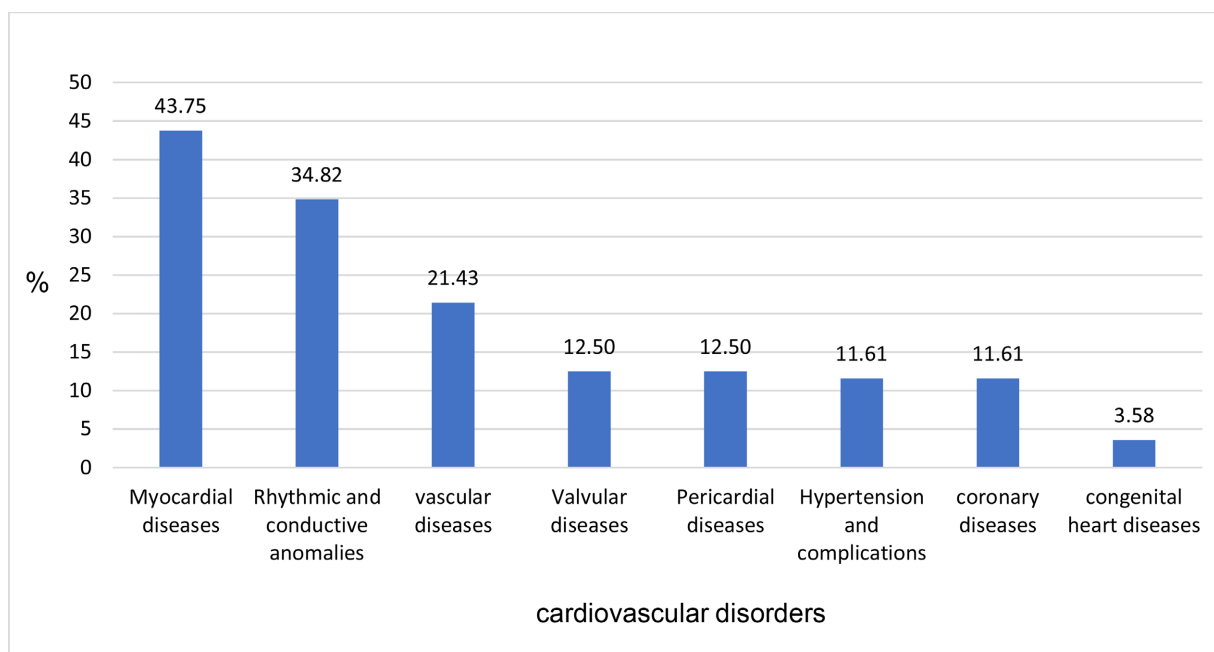


Figure 2. Distribution of patients by cardiovascular conditions.

Table 3. Distribution of patients according to disease types.

	n	%		n	%
Myocardial pathologies			Rhythmological pathologies	39	100
Dilated cardiomyopathy	35	71.42	Ventricular fibrillation	03	07.69
Peripartum cardiomyopathy	06	12.25	Ventricular tachycardia	09	23.08
Myocarditis	03	06.12	Atrial fibrillation	19	48.72
Hypertrophic cardiomyopathy	02	04.08	Atrial flutter	04	10.26
Chronic pulmonary heart	02	04.08	Atrial tachycardia	02	05.13
Non compaction of LV	01	02.05	Third-degree AV block	01	02.56
Hypertensive pathologies			Third-degree sinoatrial block	01	02.56
Hypertensive heart disease	06	46.15	Vascular pathologies	24	100
Acute pulmonary oedema	04	30.77	Pulmonary embolism	12	50.00
Stroke	02	15.39	Venous thrombosis	06	25.00
Hypertensive encephalopathy	01	07.69	Aortic dissection	03	12.50
Coronary artery disease			Acute limb ischemia	03	12.50
ACS ST+	06	46.15	Organic valvular diseases	14	100
ACS ST-	04	30.77	Mitral valve disease	06	42.86
Chronic coronary syndrome	03	23.08	Aortic valve disease	04	28.57
Congenital heart disease	04	100	Mitro-aortic valve disease	04	28.57
Tetralogy of Fallot	02	50.00	Pericardial diseases		
Patent ductus arteriosus	01	25.00	Acute pericarditis	14	100%
Interventricular communication	01	25.00			

LV: left ventricle; ACS ST+: acute coronary syndrome with ST elevation; ACS S-Stroke: Acute coronary syndrome without ST elevation; AV: atrioventricular.

Table 4. Distribution of patients who died according to comorbidities observed in the paraclinic.

	n	%
Radiological confirmation		
Lung infection	36	32.14
Biological confirmation		
Biological inflammatory syndrome	63	56.25
Renal failure	54	48.21
Anemia	52	47.27
Hyponatremia	37	33.04
Low rate of prothrombin	34	30.56

Continued

Hepatic cytolysis syndrome	29	25.89
Hypokalemia	17	15.18
Hyperkalemia	10	8.93
Hypoglycemia	04	3.57
Dysthyroidism	04	3.57
Thrombocytopenia	04	3.57

Table 5. Distribution of patients who died per treatment received.

	n	%
Injectable anticoagulants	91	80.36
Diuretics	70	62.50
Antibiotics	63	56.25
Dobutamine	47	41.96
Dopamine	32	28.57
Angiotensin-converting enzyme inhibitor	27	24.10
Beta blocker	27	24.10
Spironolactone	27	24.10
Digoxin	23	20.54
Amiodarone	22	19.64
Antiplatelet Agents	21	18.75
Statins	20	18.86
Corticosteroid therapy	17	15.18
Red blood cell transfusion	11	9.82
Noradrenaline	5	4.46
Venous vasodilators	4	3.57
Insulin	4	3.57
Evacuation of pericardial fluid	4	3.57
Dialysis	3	2.68
Thrombolysis	2	1.78
Atropine	2	1.78
Anti-tuberculosis drugs	1	0.89

in 32.14%, cardiogenic shock in 20.54% and septic shock in 13.39% as circumstances of death (**Table 6**).

4. Discussion

4.1. Main Results

Our study included 112 patients who died with a hospital mortality of 4.19%.

Table 6. Distribution of deceased patients by circumstances of death.

	n	%
Sudden death	36	32.14
Cardiogenic shock	23	20.54
Septic shock	15	13.39
Acute pulmonary edema	12	10.72
Ventricular fibrillation	6	5.36
Ventricular tachycardia	4	3.57
Metabolic causes	4	3.57
Stroke	3	2.68
Pericardial tamponade	3	2.68
Hepatorenal syndrome	2	1.79
Anoxic malaise	1	0.89
Hypovolemic shock	1	0.89
Third-degree atrioventricular block	1	0.89
Intracranial hypertension syndrome*	1	0.89

*Intracranial hypertension syndrome: headache, vomiting, visual impairment.

The average age of patients was 53.79 ± 18.27 years. Hypertension was present in 47.3% and heart failure in 66.96%. Health insurance coverage did not exist in 94.64% of the deceased. The main cardiovascular findings were myocardial in 43.75%, rhythmic and conductive in 34.82%. Thirteen cases (11.61%) of coronary artery disease and 4 cases (03.58%) of congenital heart disease were also found. Hypertensive heart disease and hypertensive emergencies such as acute pulmonary edema accounted for 46.15% and 30.77% respectively of the pathologies related to high blood pressure. Biological infectious syndrome (56.25%), renal failure (48.21%), anemia (47.27%), lung infection (32.14%), hyponatremia (33.04%) were the main comorbidities found. Among the circumstances of death, sudden death was found in 32.14%, cardiogenic shock in 20.54% and septic shock in 13.39%.

4.2. Sociodemographic Data

In our work hospital mortality in the cardiology department was 4.19% with no gender predominance. This mortality rate is low compared to that found by Damorou *et al.* [8] between 2006 and 2010 which was 11.5%. In Mali, Kantako had an intra-hospital mortality rate of 5.65% of cardiovascular diseases [10]. In Burkina Faso, Kologo had a cardiovascular mortality rate of 26.55% [11].

This large gap between the mortality rates found between Burkina Faso and Togo could be explained by the place of study, which was that of the medical and emergency services in Burkina Faso. Nevertheless, a decrease in mortality is noted in the Togolese series from 2006 to 2021. This may be explained by the

increasing improvement in the cardiology patient management linked to advances in the field. The low mortality rate in our study could hide the fact that many patients with heart disease would die in an out-of-hospital setting due to lack of resources and in emergency departments. Another reason might be missing or incomplete files.

The health insurance coverage rate was low with more than ¾ of the deceased patients not having it. This reflects national health insurance coverage. In fact, health insurance coverage covers only 7.6% of the population, 4% of which is covered by the National Institute of Health Insurance (INAM) scheme, 2% of private systems and 1.6% of health insurance companies [12]. The relatively high direct cost of hospitalizations in cardiology (380 dollars US or 11.4 times the guaranteed inter-professional minimum wage in Togo in 2012), associated with the lack of health insurance is a factor limiting access to healthcare [13]. Our results are similar to those of Coumba in Mali, who found a lack of health insurance in 68% of patients [14].

Patients who died were relatively young and over half were less than 60 years old. This is also the case in sub-Saharan African countries, partly explained by the high number of poorly controlled cardiovascular risk factors in the region including hypertension, smoking, diabetes and obesity [11].

4.3. Clinical Data

Hypertension was the most common cardiovascular risk factor in 47.32%. This result is low compared to those found by Damorou [8] and Pio [15] in Togo, and Kantako in Mali [10], which were respectively 68.8%, 52.5% and 63.8%. This may be related to a poorly performed interview that did not reveal the pathology of hypertension in patients. In addition, in emergency situations, the interview is done with parents who do not usually control the patient's history.

At admission, the symptoms presented by deceased patients were dominated by dyspnea (77.68%). Chest pain and palpitations were reported by deceased patients in 15.18% and 3.6% respectively. These symptoms are only clinical manifestations of emergency-managed illnesses.

In our study, deceased patients had a history of chronic heart disease (40.17%) and chronic heart failure (36.60%). This reflects the already fragile condition of patients who died prior to being admitted. These pathologies are susceptible to complications at any time with the permanent risk of sudden death [16]. Despite remarkable improvements in treatment, the prognosis of patients with heart failure remains bleak, with nearly 20% of patients dying within a year of initial diagnosis and 80% dying at age 8 [17]. Of the deaths of patients with heart failure, up to 50% are sudden and unexpected; patients with heart failure have a sudden cardiac death rate 6 to 9 times higher than that of the general population [17].

4.4. Recovered Cardiovascular Conditions and Comorbidities

Myocardial diseases were the most common among which dilated cardiomyo-

pathy represented 71.42%. These results are superior to those found by Damorou in Lome which were 16% between January 2005 and June 2006 [18], reflecting once again the increasing in the frequency of cardiovascular diseases with their share of complications. Severe ventricular rhythm disorders accounted for 30% in our study. These severe ventricular rhythm disorders are most often the preserve of advanced heart disease and make the bed of sudden death [17]. Among coronary pathologies, acute coronary syndrome with ST elevation accounted for 46%. It is a growing disease in Africa as demonstrated by Suliman in Khartoum in 2011 [19]. It requires urgent management but encounters late diagnosis, unavailability of the technical platform and a low availability of qualified human resources [5] [20].

The biological inflammatory syndrome was found in 63% of deceased patients with confirmed pulmonary focus in 32% of deceased patients as comorbidities. This is in line with the increasing incidence of pneumococcal lung infections of 93.7 per thousand in adults with chronic heart disease, hence the vaccine recommendations against influenza viruses, pneumococcus in patients with heart disease to reduce the risk of decompensation [21]. Renal failure, anemia and hyponatremia were found as co-morbidities in our study in 48%, 47% and 33% of cases, respectively. They are described as powerful prognostic markers [22].

4.5. Therapeutic Data and Evolution

The therapies administered to patients before their death, according to indications, were represented by 62% diuretics. Antibiotics were used in 56%, inotropics supports at 41% and 28%, 4.46% for dobutamine and dopamine and norepinephrine respectively. Few patients had received dialysis (2.68%) and thrombolysis was only performed in 02 patients (1.78%). The use of diuretics and inotropics supports could be explained by the higher proportion of heart failure in our study, which is the ultimate stage of most of the terminal heart disease with heart failure in relation to the natural evolution.

The average length of hospitalization was 6.87 ± 8.7 days. This result is higher than that found by Kologo in Burkina Faso (2.7 ± 2.6 days) [11]. This difference could be explained by the study framework which was emergency and medical services with most deaths in the medical emergency department (86%); emergency departments that are not a patient hospital unit but rather a transit location.

The circumstances of the deaths found in our study were mainly sudden death in 32.14%, cardiogenic shock in 20.54% and septic shock in 13.39%; Acute pulmonary edema was 12%. Koudougou in Burkina Faso found similar results in septic shock and acute pulmonary edema [11]. This is because most cardiac pathologies would develop in long-term shock by defusing the heart pump. This may be due to a delayed consultation at complication stages and life-threatening emergencies. Sudden death is common in patients with heart disease as shown in many studies [16] [17] [23].

Only one case of anoxic discomfort was observed in our study, indicating serious complications of an untreated Fallot tetralogy. Togo does not have a technical platform for surgical management, so congenital heart disease is not often treated for lack of resources. Despite the intervention of non-governmental organizations such as “Terre des hommes” and “Chaine de l’espoir”, there are still many untreated congenital heart diseases that are sometimes discovered in adulthood with its corollary of complications and death [8] [24].

4.6. Limitations and Difficulties

Our study was limited only to deaths in the cardiology department at CHU SO. Deaths that occurred at home and were reported in the records or elsewhere were not taken into account for patients who had recently hospitalized or who received cardiology follow-up. This is the specific case of Covid patients with heart disease. According to the Covid-19 management organisation in Togo, these patients were transferred to the Lome Regional Hospital Center and the deaths were not recorded and not taken into account in our study. The retrospective character with incomplete files and sometimes lost files is also a limit to our study. Despite these limitations, our study is of paramount importance. It is the first of its kind to take stock of the deaths that occurred in a cardiology department in Togo, by listing the main pathologies as well as the circumstances that occurred.

5. Conclusion

Cardiovascular disease is a public health problem in the world and in countries undergoing epidemiological transition, including Togo. They are responsible for early mortality, as our study shows. The low mortality rate in our study could hide the fact that many patients suffering from heart disease would die outside the hospital due to lack of resources and in emergency departments. Many cardiovascular risk factors are responsible for these diseases with hypertension in the foreground. Unfortunately, these are patients with enormous financial difficulties, most of whom do not have health insurance coverage. All cardiovascular diseases are found in varying proportions in these deceased patients with a clear presence of myocardial damage. These patients arrive at the hospital in the terminal stage with complications including heart failure, which makes the bed of sudden death. In addition to these complications ring the death knell for these patients, especially infectious, renal and metabolic comorbidities aggravate their already fragile state. Insufficient therapeutic management due to a lack of technical platform also contributes to raising this mortality of patients in cardiology. Several actions should be carried out on cardiovascular prevention, improvement of the quality of patient care, universal health insurance and improvement of technical platforms.

Ethics Statement

The studies involving human participants were reviewed and approved by CHU

SO authority and the data was processed anonymously.

Author Contributions

Yaovi Mignazonzon Afassinou, Kossi Edem Dola and Soudougoua Baragou conceived and designed research. Soulemane Pessinaba and Borgatia Atta conducted sample collection. Yaovi Mignazonzon Afassinou, Kossi Edem Dola, Machihude Pio and Findibe Damorou performed sample analyses and statistical analysis. Yaovi Mignazonzon Afassinou and Kossi Edem Dola wrote the manuscript. All authors contributed to the article and approved the submitted version.

Acknowledgements

The authors thank the staff of Cardiology department of CHU SO their support.

Conflicts of Interest

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

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Appendix. Pre-Established Data Sheet

1. Sociodemographic data

Record numero:

Age:..... Gender:..... Sickness insurance coverage: Yes..... No.....

2. Clinical data

Admission reason: 1-Dyspnea 2-lower limb edema 3-Chest pain 4-Asthenia 5-Palpitations
6-Syncope 7-Hemoptysis 8-Fever 9-Other.....

Admission mode: 1-transfers/references 2-direct admissions

Cardiovascular risk factors: 1-Hypertension 2-Dyslipidemia 3-Diabetes 4-Tobacco
5-Menopause 6-Alcohol consumption 7-Other:.....

Personal medical history: 1-Chronic heart disease 2-Chronic heart failure 3-Atrial fibrillation 4-Stroke
5-Venous thromboembolic disease 6-Chronic kidney disease
7-Asthma 8-Sickle cell anemia 9-Thyroid dysfunction
10-Other:.....

3. Cardiovascular conditions

Myocardial pathologies 1-Yes 2-No if yes specify

1-Dilated cardiomyopathy 2-Peripartum cardiomyopathy 3-Myocarditis

4-Hypertrophic cardiomyopathy 5-Chronic pulmonary heart 6-Non compaction of LV

Hypertensive pathologies 1-Yes 2-No if yes specify

1-Hypertensive heart disease 2-Acute pulmonary oedema 3-Stroke 4-Hypertensive encephalopathy

Coronary artery disease 1-Yes 2-No if yes specify

1-ACS ST+ 2-ACS ST- 3-Chronic coronary syndrome

Congenital heart disease 1-Yes 2-No if yes specify

1-Tetralogy of Fallot 2-Patent ductus arteriosus 3-Interventricular communication

Rhythmological pathologies 1-Yes 2-No if yes specify

1-Ventricular fibrillation 2-Ventricular tachycardia 3-Atrial fibrillation

4-Atrial flutter 5-Atrial tachycardia 6-Third-degree AV block

7-Third-degree sinoatrial block

Vascular pathologies 1-Yes 2-No if yes specify

1-Pulmonary embolism 2-Venous thrombosis 3-Aortic dissection 4-Acute limb ischemia

Organic valvular diseases 1-Yes 2-No if yes specify

1-Mitral valve disease 2-Aortic valve disease 3-Mitro-aortic valve disease

Pericardial diseases 1-Yes 2-No if yes specify

1-Acute pericarditis 2-Chronic pericarditis

4. Comorbidities

Lung infection 1-Yes 2-No

Biological inflammatory syndrome 1-Yes 2-No

Renal failure 1-Yes 2-No

Anemia 1-Yes 2-No

Hyponatremia 1-Yes 2-No

Low rate of prothrombin	1-Yes	2-No
Hepatic cytolysis syndrome	1-Yes	2-No
Hypokalemia	1-Yes	2-No
Hyperkalemia	1-Yes	2-No
Hypoglycemia	1-Yes	2-No
Dysthyroidism	1-Yes	2-No
Thrombocytopenia 1-	Yes	2-No

Others:.....

5. Therapeutic aspects

Check the treatment if yes

- | | | | | |
|---|-------------------------------|------------------------|--------------|------------|
| 1-Injectable anticoagulants | 2-Diuretics | 3-Antibiotics | 4-Dobutamine | 5-Dopamine |
| 6-Angiotensin-converting enzyme inhibitor | 7-Beta blocker | 8-Spironolactone | | |
| 9-Digoxin | 10-Amiodarone | 11-Antiplatelet Agents | 12-Statins | |
| 13-Corticosteroid therapy | 14-Red blood cell transfusion | 15-Noradrenaline | | |
| 16-Atropine | 17-Anti-tuberculosis drugs | 18-Venous vasodilators | 19-Insulin | |
| 20-Evacuation of pericardial fluid | 21-Dialysis | 22-Thrombolysis | | |

6. Evolution

Duration of hospitalization (days):

Favourable development: 1-Yes 2-No

Death: 1-Yes 2-No

Circumstances of Death: specify the circumstances of the death

- | | | | |
|----------------------------|---------------------------|--|-------------------------|
| 1-Sudden death | 2-Cardiogenic shock | 3-Septic shock | 3-Acute pulmonary edema |
| 4-Ventricular fibrillation | 5-Ventricular tachycardia | 6-Metabolic causes | |
| 7-Stroke | 8-Pericardial tamponade | 9-Hepatorenal syndrome | |
| 10-Anoxic malaise | 11-Hypovolemic shock | 12-Third-degree atrioventricular block | |

Others: