

Epidemiology of Ventricular Rhythm Disorders in the Cardiology Department of the Ignace Deen Hospital in Conakry

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How to cite this paper: Balde, E.Y., Keita, F.B., Bah, M.B., Camara, O.M., Barry, I.S., Diawara, M., Diallo, H., Kone, A., Kaba, A.K. and Balde, M.D. (2025) Epidemiology of Ventricular Rhythm Disorders in the Cardiology Department of the Ignace Deen Hospital in Conakry. *Open Journal of Epidemiology*, **15**, 566-572.
<https://doi.org/10.4236/ojepi.2025.153036>

Received: May 26, 2025

Accepted: August 9, 2025

Published: August 12, 2025

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Abstract

Introduction: Ventricular rhythm disorders are frequent and constitute a major cause of mortality. They can occur in a healthy heart or one affected by organic cardiac pathology. The aim of this study was to investigate the epidemiological aspects of ventricular rhythm disorders in the cardiology department of the Ignace Deen Hospital in Conakry. **Materials and Methods:** This was a retrospective descriptive study covering a period of two (02) years, from January 1, 2022 to December 31, 2023, relating to hospitalized patient files in the cardiology department for ventricular rhythm disorders. Our study variables were quantitative and qualitative. **Results:** During our study, 1300 patients were admitted, including 17 cases of ventricular rhythm disorders or a frequency of 1.31%. The mean age of the patients was 72.3 ± 13.8 years; male gender was the most represented with a sex ratio of 1.15; the most frequent modifiable cardiovascular risk factors were high blood pressure (59%) and diabetes (24%). Functional signs were dominated by palpitations (76%). Isolated ventricular extrasystoles (VES) were the most frequent type of rhythm disorder on electrocardiogram (52.9%); sustained ventricular tachycardia (VT) was present in 23.52% of patients; treatment of the rhythm disorder was dominated by membrane stabilizers (magnesium) and antiarrhythmics (70.5% and 41.18% respectively). The evolution was favorable in 94.12% of patients. **Conclusion:** Our study highlights the importance of ventricular rhythm disorders in Guinean cardiological environment, particularly in elderly patients and those with cardiovascular risk factors such as high blood pressure (HBP) and diabetes.

Keywords

Ventricular Rhythm Disorders, Cardiology, Ignace Deen

1. Introduction

Ventricular rhythm disorders are abnormalities of heart rhythm that originate in the ventricles, the two lower chambers of the heart. These disorders occur when the electrical activity of the heart becomes disorganized, resulting in an irregular or too rapid contraction of ventricles, which can harm blood circulation and, in some cases endanger life [1].

There are several types of ventricular rhythm disorders, among which, the most frequent are VESs, VTs and ventricular fibrillation (VF); the causes of these disorders can be multiple, occurring mainly in the context of ischemic heart disease, in the acute phase of myocardial infarction, or at later stages during electrolyte imbalances, autonomic nervous system disorders or environmental factors such as intense stress. They can also occur in the absence of an underlying anatomical substrate [2].

Ventricular rhythm disorders are a major cause of mortality in developed countries [3]. In a study done in United States of America, a sample of 500,000 adults, ventricular arrhythmias (all forms combined) were present in 0.19%. Prevalence increases with age, reaching 0.59% in men over 65 years of age [4]. The proportion of cardiovascular deaths linked to arrhythmias increased from 16% in 1999 to nearly 32% in 2023 [5]. In the European Union, it is estimated that 350,000 people die of ventricular origin every year. In Germany, a study showed that 2% to 5% of cardiac arrests are associated with ventricular arrhythmias, particularly ventricular fibrillation [6]. In France, ventricular arrhythmias are also a significant cause of cardiac arrest. A recent French study estimates approximately 50,000 cardiac arrests per year, with an incidence of approximately 1 per 1000 inhabitants, and a significant proportion of these arrests are attributable to ventricular arrhythmias, mainly in older adults and people with cardiovascular comorbidities [7]. In China, ventricular arrhythmias and cardiac arrests are increasing due to the increased prevalence of cardiovascular disease. In 2019, mortality from sudden cardiac arrest, often caused by ventricular arrhythmias, was estimated to affect approximately 544,000 people per year [8].

In South Africa, ventricular arrhythmias are common in patients with advanced cardiovascular disease. A study conducted in urban hospitals in Cape Town found that 15% of sudden deaths were attributed to ventricular fibrillation, and this rate is exacerbated by the lack of access to defibrillation care and equipment [9].

In Nigeria, nearly 10% of arrhythmia cases treated in emergency settings involve ventricular arrhythmias [10]. In Mali, in studies conducted in a hospital environment, N'Guissan found a prevalence of heart failure with ventricular rhythm disorder of 22.29% at the Point G University Hospital in 2010 [11].

The diagnosis of ventricular rhythm disorders is based on the electrocardiogram (ECG), which detects these abnormalities of the heart rhythm [5]. Treatment varies according to the severity of the disorder and its underlying causes; it may include antiarrhythmic treatments, interventions such as cardioversion or ablation as well as medical devices such as implantable defibrillators in case

of high risk of sudden death. Early and appropriate management is essential to reduce serious complications and improve the quality of life of affected patients [6].

2. Patients and Methods

This was a retrospective descriptive study over a period of two (02) years, from January 1, 2022 to December 31, 2023, to the cardiology department of the Ignace Deen Hospital of Conakry, relating to patients admitted to the department for cardiac rhythm disorders; we included patients with a rhythm disorder of ventricular origin Proven by a resting electrocardiogram (ECG) excluding Other types of non-ventricular rhythm disorders; our quantitative and qualitative study variables divided into socio-demographic and anthropometric data: age (in years), gender (male or female). Cardiovascular risk factors: HBP, smoking, diabetes mellitus, dyslipidemia, obesity. Clinical data: functional signs, underlying heart disease.

Management: treatment of ventricular rhythm disorder (antiarrhythmics, external electric shock), etiological treatment.

Hospital evolution: favorable and unfavorable.

Socio-epidemiological, clinical, therapeutic and evolving data have been collected via a dedicated form. Analysis was performed using SPSS 21 software, with frequencies for qualitative variables and means for quantitative ones. Data was collected anonymously to guarantee confidentiality.

3. Results

During our study, 1300 patients were admitted, including 17 cases of ventricular rhythm disorders, representing a frequency of 1.31%. The mean age of the patients was 72.3 ± 13.8 years, the male gender was the most represented with 52% and a sex ratio of 1.15 (**Table 1**). Functional signs were dominated by palpitations or 76% (**Table 2**), HBP (59%) and dilated cardiomyopathy (24%) were the most frequent underlying cardiopathies (**Figure 1**). Isolated VES were the most frequent

Table 1. Patient distribution according to age and gender.

	Numbers (N = 17)	Percentage (%)
Age		
20 - 39	4	24
40 - 59	5	29
60 - 79	7	41
≥80	1	5,8
Type		
Male	9	52%
Female	8	48%

Sex Ratio: 1.15, Average age: 72.3 ± 16.70 years, Extremes: 20 and 82 years.

type of rhythm disorders on ECG or 52.9% (**Table 2**).

Treatment of rhythm disorders was dominated by membrane stabilizers in particular magnesium in 70.58% of cases % (**Table 3**). Beta blockers were the most used background treatment in 52.94% of cases monitoring of class III antiarrhythmics, notably Cordarone in 41.18% (**Table 4**). The evolution was favorable in 94.12% of patients; there was 1 case of death or 5.88%.

Table 2. Patient distribution according to functional and electrocardiogram signs.

Functional signs	Workforce	Percentage (%)
Palpitations	13	76
Dyspnea	12	70
Chest pain	9	52
Cough	7	41
Hepatalgia for effort	0	00
Syncope	0	00
ECG		
Isolated ventricular extra systole	9	52.94
Non-sustained ventricular tachycardia	4	23.52
Bigeminy ventricular extra systole	2	11.6
Sustained ventricular tachycardia	2	11.6

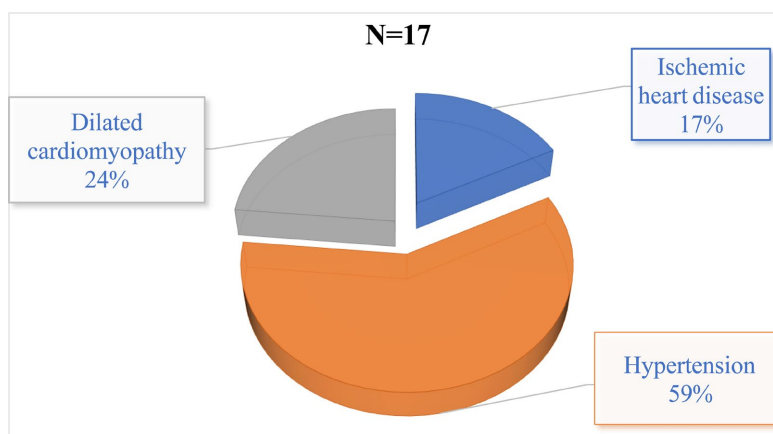


Figure 1. Patient distribution according to underlying heart disease.

Table 3. Patient distribution according to rhythm disorder treatment.

Treatment	Workforce	Percentages (%)
Magnesium	11	70.58
Anti-arrhythmics	7	41.18
External electric shock	1	5.8
Angioplasty	1	5.8

Table 4. Patient distribution according to etiological treatment.

Treatment	Workforce	Percentages (%)
Beta blockers	9	52.94
Cordarone	7	41.18%
Angiotensin converting enzyme	8	47.06
Mineralocorticoid receptor antagonist	8	47.06
Antiplatelet aggregants	5	29.41
Statins	5	29.41
Nephrllysine inhibitor	2	11.76

4. Discussion

Out of 1300 patients admitted to the department, we recorded 17 cases of ventricular rhythm disorders or a hospital frequency of 1.831%. Our result is lower than that of N'Guissan in Mali in 2010 [11], who had brought back a hospital frequency of 4.05%. This difference could be explained by diagnostic difficulty, the absence of Holter ECG continuous heart rate monitoring, but also by the fact that our study was based on sporadic recordings that do not capture short or transient episodes of ventricular disorders, which could go unnoticed [11].

The study revealed that patients with ventricular rhythm disorders (VRD) were mainly male, and that the most affected age group was 60 - 79 years. This predominance of the elderly is in line with global epidemiological data, which show that the incidence of arrhythmias, particularly VRDs, increases with age, due to the cardiac pathophysiological changes that occur during aging. Furthermore, the higher incidence of rhythm disorders in men could be linked to a higher prevalence of chronic diseases such as HBP, Doron A and al. observed in their study in united states that men had approximately 1.7 to 2 times more polymorphic premature ventricular contraction than women thus explaining the increased frequency of ventricular rhythm disorders in men [12].

The identified risk factors in our study include HBP (High Blood Pressure) and diabetes, These factors are well established as major determinants of VRDs and other cardiovascular diseases, observed in the majority of patients in our study, plays a central role in the development of ventricular arrhythmias, it promotes the onset of ventricular arrhythmias, particularly via pressure overload-induced left ventricular hypertrophy (LVH), creating a substrate conducive to ventricular ectopy and tachycardia, a study on Egyptian patients showed that ventricular wall thickness (PWTd) is an independent predictor of high ventricular extrasystole frequency [13]; diabetes, identified in some patients in our sample, is also an important factor. It is well documented that chronic hyperglycemia contributes to myocardial dysfunction through various mechanisms, including oxidative stress, chronic inflammation, and microangiopathy that impair heart conduction. Ischemic heart disease has also been identified as a risk factor in some of our pa-

tients. Studies such as those of Dickstein and col. in 2008 confirm an increased prevalence of VRDs due to major risk factors such as HBP and diabetes [14].

Isolated VESs (ventricular extrasystole) were the VRD type that was identified the most in our study. The frequency of VESs in this population is compatible with the results of studies carried out in Europe [15] by DI Bernando and col. and in USA by Chan and col. [16]. This similarity could be explained by the fact that VES are the most frequent VRDs, due to their often benign nature and their frequent origin in relatively benign cardiac conditions. Their high frequency can also be attributed to easy detection by ECG exams and their asymptomatic nature in many cases, data from Holter recordings in at-risk populations (such as dilated cardiomyopathy) report that extra systol ventricular are the most common abnormality: up to 82% of patients have them, compared to 30% for sustained ventricular tachycardia [17].

The study also shows moderate use of antiarrhythmic drugs which are recommended for stabilization of heart rhythm in case of sustained VT or VF. However, it would be interesting to discuss the more frequent establishment of implantable automatic defibrillation devices (IADs) in this population, in line with the recommendations of the European Societies of Cardiology, particularly in patients at risk of sudden death [18]. Treatment of the etiology was dominated by medical treatment of HF. Coronary angioplasty was performed in one of our patients, reflecting the lack of sufficient technical facilities and poor accessibility for the population.

5. Conclusion

VRDs constitute a set of potentially serious conditions that can endanger the life of the patient. Their early detection, their accurate assessment and their suitable management are essential to avoid major complications. Our study highlights the importance of VRDs in the Guinean population, especially in elderly patients and those with cardiovascular risk factors such as HBP and diabetes.

Authors' Contributions

All authors have read and approved the final, revised version of this article.

Keita Fatoumata Binta and Camara Ousmane Mamadama, contributed to the design of the study and discussion of the results.

Keita Fatoumata Binta and Camara Ousmane Mamadama contributed to data collection and analysis of statistical data for the study.

Baladé Elhadj Yaya took an active part in drafting the manuscript and editing the article, ensuring the accuracy and clarity of the information presented.

Conflicts of Interest

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

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