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Management of Cardiac Arrhythmias in the Resuscitation Room: A Retrospective Study

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ABSTRACT

Background: Tachyarrhythmias managed in the resuscitation room are common and may rapidly become life-threatening. We aimed to describe the clinical profile, electrocardiographic diagnoses, first-line treatments, and immediate outcomes of adults treated for an arrhythmia.
Methods: Single-center retrospective study conducted in the resuscitation room of Ibn Sina University Hospital (Rabat, Morocco) over a 2-month period (July-August 2022). Adults (>=18 years) with an ECG-confirmed arrhythmia were included; arrhythmias occurring during acute coronary syndrome were excluded. Demographic, clinical, ECG and treatment data, as well as immediate outcomes, were analyzed descriptively.
Results: Twenty patients were included (mean age 61.4 years; 60% female). Atrial fibrillation was the most frequent arrhythmia (80%), followed by ventricular tachycardia (10%). Hemodynamic instability at presentation was observed in 15%. Electrical synchronized cardioversion was performed as first-line therapy in 10%. Pharmacological management predominated (90%), with amiodarone used in 60%. Rhythm conversion was achieved in 75% and rate control in 10%; 15% required treatment escalation. In-hospital mortality in the resuscitation room pathway was 10%.
Conclusion: Emergency management relies on rapid tolerance assessment, correction of reversible causes, and immediate access to synchronized cardioversion and monitoring. Protocol reinforcement and improved access to cardioversion equipment may further optimize care.

KEYWORDS

Arrhythmia; Atrial fibrillation; Ventricular tachycardia; Electrical Cardioversion; Amiodarone; Emergency Medicine.

MAIN ARTICLE

INTRODUCTION

Cardiac arrhythmias are a frequent reason for emergency department attendance and hospital admission. They may occur in structurally normal hearts or in the context of underlying heart disease, and their clinical presentation ranges from benign palpitations to cardiogenic shock or cardiac arrest. Initial management is primarily guided by clinical tolerance, including hemodynamic stability, signs of myocardial ischemia, and acute heart failure. In the resuscitation room, rapid diagnosis and early implementation of evidence-based algorithms (synchronized cardioversion for unstable tachyarrhythmias, appropriate drug therapy for stable patients, and correction of precipitating factors) are essential to improve outcomes.

MATERIALS AND METHODS

Study design and setting

We performed a single-center retrospective descriptive study in the resuscitation room of the Emergency Department at Ibn Sina University Hospital (Rabat, Morocco) over a two-month period (July-August 2022).

Participants

We included all patients aged 18 years or older who were managed in the resuscitation room for a cardiac arrhythmia confirmed on 12-lead ECG. Arrhythmias occurring during the acute phase of an acute coronary syndrome were excluded.

Data collection

Variables collected were: (i) socio-demographic characteristics (age, sex), (ii) clinical data (past medical history, chronic treatments, reason for admission, vital signs), (iii) complementary investigations (laboratory tests, ECG findings, echocardiography when available), and (iv) treatment modalities (first-line therapy, response, and immediate evolution).

Statistical analysis

Data entry was performed using Microsoft Excel and descriptive analyses were produced using Power BI. Quantitative variables are presented as means, and qualitative variables as counts and percentages.

Ethics

This retrospective analysis used routinely collected clinical data. Patient identifiers were not included in the dataset used for analysis.

RESULTS

Baseline characteristics

A total of 20 patients were included. The mean age was 61.4 years and 60% were women. The most frequently reported cardiovascular risk factors and comorbidities were advanced age (75%), hypertension (50%), and ischemic heart disease (45%).

Table 1. Baseline characteristics of the study population (n=20).

Variable	n	%
Female sex	12	60
Age (risk factor)	15	75
Hypertension	10	50
Ischemic heart disease	9	45

Arrhythmia type and clinical tolerance

Atrial fibrillation was the most common arrhythmia (80%), followed by ventricular tachycardia (10%). Hemodynamic instability at presentation was observed in 15% of cases.

Table 2. Arrhythmia types and hemodynamic status at presentation.

Arrhythmia / status	n	%
Atrial fibrillation	16	80
Ventricular tachycardia	2	10
Hemodynamic instability on arrival	3	15

Management and immediate outcomes

Two patients (10%) underwent first-line synchronized electrical cardioversion. Pharmacological therapy was used as initial treatment in 90%, with amiodarone being the most frequently administered agent (60%). Rhythm conversion was achieved in 75% of cases, while rate control without conversion was obtained in 10%. Persistent tachycardia requiring treatment modification occurred in 15%. Overall mortality in this pathway was 10%.

Table 3. Acute management and immediate outcomes in the resuscitation room.

Treatment / outcome	n	%
Electrical cardioversion (first-line)	2	10
Pharmacological treatment (first-line)	18	90
Amiodarone use	12	60
Rhythm conversion	15	75
Rate control (without conversion)	2	10
Persistent arrhythmia requiring escalation	3	15
Mortality	2	10

DISCUSSION

In this retrospective resuscitation-room series, atrial fibrillation with rapid ventricular response represented the predominant arrhythmic diagnosis, and approximately one in six patients presented with hemodynamic instability. Our findings are consistent with the high burden of atrial fibrillation in emergency care and underscore the need for structured, time-critical algorithms prioritizing tolerance assessment and immediate stabilization.

Atrial fibrillation is the most common sustained arrhythmia encountered in adults and is associated with increased morbidity and mortality, particularly in patients with underlying cardiovascular disease. Contemporary European Society of Cardiology (ESC) guidance emphasizes an integrated approach combining symptom control, management of triggers, and early evaluation of thromboembolic risk. In the acute setting, the first decision point remains the presence of hemodynamic instability (hypotension, shock, acute heart failure, ischemia, altered consciousness). In unstable patients, synchronized electrical cardioversion is recommended as the most effective and rapid strategy to restore perfusing rhythm, with sedation and airway readiness whenever feasible.

In our cohort, electrical cardioversion was used as first-line therapy in 10%, a proportion that likely reflects the relatively limited proportion of unstable presentations (15%). In stable patients, pharmacological strategies predominated (90%). Amiodarone was the most frequently used drug (60%), reflecting its availability and broad-spectrum antiarrhythmic effect. However, contemporary recommendations generally favor rate control with beta-blockers or non-dihydropyridine calcium channel blockers for stable atrial fibrillation, while rhythm control (including pharmacological or electrical cardioversion) is considered based on symptom burden, duration of arrhythmia, and the presence of structural heart disease. The preference for amiodarone in our setting may also be influenced by contraindications to other agents, local practice, and monitoring constraints.

Ventricular tachycardia accounted for 10% of cases in this study. The management of ventricular tachycardia in the emergency department similarly depends on clinical tolerance. The 2022 ESC guideline highlights the importance of rapid identification of structural heart disease, prompt synchronized cardioversion for unstable sustained ventricular tachycardia, and consideration of antiarrhythmic drugs (e.g., amiodarone) for stable monomorphic ventricular tachycardia. In any sustained ventricular tachyarrhythmia, correction of reversible causes (hypoxia, electrolyte disturbances, acid-base disorders, drug toxicity) remains a cornerstone of care.

Overall, rhythm conversion or effective rate control was achieved in 85% of patients, suggesting that timely algorithm-based management is feasible in the resuscitation room. Nevertheless, persistent tachycardia requiring escalation occurred in 15%, and mortality reached 10%. While our dataset does not allow causal inference, these outcomes likely reflect the severity of underlying disease and the acuity of presentation. International series similarly report increased short-term risk among patients presenting with arrhythmias complicated by heart failure, ischemia, or shock. Therefore, early risk stratification and streamlined pathways for intensive monitoring and cardiology/ICU referral are essential.

From a systems perspective, our findings support targeted quality-improvement actions: (i) standardized local protocols aligned with advanced life support and tachyarrhythmia algorithms, (ii) consistent availability of a defibrillator capable of synchronized cardioversion, (iii) rapid access to sedation/analgesia and airway equipment for cardioversion, and (iv) structured documentation enabling audit and feedback. Such measures may reduce time-to-intervention and improve safety, especially during high-acuity periods.

LIMITATIONS

This study has several limitations. It was retrospective, single-center, and based on a small sample size, which limits generalizability. We focused on immediate management and short-term outcomes; longer-term endpoints (recurrence, stroke, readmission) were not captured. Finally, detailed data regarding arrhythmia duration, anticoagulation status, and echocardiographic findings were not consistently available in all records.

CONCLUSION

In this resuscitation-room cohort, atrial fibrillation was the most frequent arrhythmia, and pharmacological management—most often using amiodarone—was the predominant first-line strategy. A systematic assessment of hemodynamic tolerance and readiness to perform synchronized cardioversion remain central to emergency care. Strengthening protocol-based management, monitoring resources, and access to cardioversion equipment may further improve outcomes.

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