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ADVANCES IN THE MANAGEMENT OF ACUTE ATRIAL FIBRILLATION: UPDATES FROM LAST THREE YEARS IN CLINICAL GUIDELINES

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ABSTRACT

Acute atrial fibrillation (AF) is a common clinical emergency associated with increased morbidity, mortality, and hospitalizations. This study aims to critically review and compare the most recent updates (2022–2025) from the American (ACC/AHA/HRS), European (ESC), and Brazilian (SBC) guidelines for the management of acute AF. Through a narrative literature review, differences were analyzed regarding strategies for rate versus rhythm control, anticoagulation, cardioversion, blood pressure targets, and catheter ablation indications. Although the guidelines share common evidence-based principles, they diverge on key aspects, such as anticoagulation initiation criteria and early Indications for cardioversion or ablation. The European guidelines tend to adopt earlier and more aggressive approaches, whereas the American and Brazilian guidelines prioritize more conservative strategies adapted to local contexts. It is concluded that individualized treatment, combined with the implementation of updated guidelines tailored to each healthcare system's reality, is essential to improve clinical outcomes in patients with acute AF.

KEYWORDS: acute atrial fibrillation; clinical guidelines; rhythm control; anticoagulation; catheter ablation; cardioversion.

INTRODUCTION

Fibrillation (AF) is the most common sustained cardiac arrhythmia in clinical practice, characterized by rapid and disorganized atrial electrical activity, resulting in the loss of effective atrial contraction and an irregular ventricular response. On the electrocardiogram (ECG), AF is identified by the absence of distinct P waves and irregular RR intervals, reflecting variable atrioventricular conduction (Hindricks et al., 2021).

Acute AF refers to newly onset, often symptomatic, episodes requiring rapid therapeutic decision-making to minimize thromboembolic, hemodynamic, and symptomatic risks. It is a critical challenge in cardiology practice, requiring rapid decision-making to minimize thromboembolic risks, hemodynamic instability, and cardiovascular complications. It is estimated that approximately 35% of hospitalizations for cardiac arrhythmias are attributed to acute AF, reinforcing its clinical and epidemiological relevance (Hindricks et al., 2021). Furthermore, newly diagnosed or sudden-onset AF is associated with a higher risk of adverse events such as stroke and the onset or worsening of heart failure, especially when occurring in critically ill patients or those with pre-existing cardiovascular comorbidities (Lippi et al., 2021; Kirchhof et al., 2020; Kotecha et al., 2020).

Acute AF is associated with a significant increase in in-hospital and long-term mortality. Studies indicate that patients hospitalized with new-onset AF have a 1.5- to 2-fold increased risk of death compared with those without the arrhythmia (GBD 2020). The risk is even higher in patients with acute coronary syndrome (ACS), where the presence of AF can double 30-day mortality (Diener et al., 2019).

Hospital readmission rates, especially in patients without adequate rate or rhythm control. Data suggest that approximately 20 to 25% of patients with acute AF return to the hospital within 30 days of discharge, often due to arrhythmia recurrence or associated complications (ESC, 2020).

In Brazil, AF is estimated to be responsible for more than 150,000 annual hospitalizations, with a prevalence

ranging from 1.5% to 2% in the adult population and may exceed 10% in individuals over 80 years of age (SBC, 2023). However, challenges such as undertreatment of anticoagulation remain a relevant problem, with only 50–60% of eligible patients receiving adequate anticoagulation (Lopes et al., 2021).

In the United States, AF affects approximately 5 million people, accounting for 750,000 annual hospitalizations. With increasing life expectancy and the prevalence of risk factors such as obesity, hypertension, and diabetes, the number of cases is projected to double by 2050 (January et al., 2019). In Europe, AF affects approximately 3% of the adult population, a higher rate than in other regions due to more advanced demographic aging. In Europe, the arrhythmia leads to 2.5 million hospitalizations per year, representing a significant burden on health systems (Hindricks et al., 2021).

When analyzing the global scenario, new research and clinical trials have led to updated international guidelines, seeking to optimize the management of acute AF and reduce its clinical impacts. However, there are differences in the approaches adopted by North America, Europe, and Brazil, reflecting not only the availability of therapeutic resources but also distinct clinical decision-making strategies.

Given this scenario, it is urgent to critically analyze the guideline updates of the last three years, comparing the recommendations of the main scientific societies and highlighting their implications for medical practice. Studying these differences is essential to optimize the therapeutic approach and ensure better outcomes for patients.

MATERIALS AND METHODS

This study consists of a literature review with a comparative focus on American, European, and Brazilian guidelines on the management of acute AF, considering updates published in the last three years. The official guidelines published by the following medical societies were consulted: American College of of Cardiology (ACC), American Heart Association (AHA) and Heart Rhythm Society (HRS), for American guidelines; European Society of Cardiology (ESC), for European guidelines; Brazilian Society of Cardiology (SBC), for Brazilian guidelines.

Additionally, a systematic search was performed in indexed databases, including PubMed, Scopus, and SciELO, using the following descriptors in Portuguese and English: “acute atrial fibrillation”, “ guidelines”, “directives”, “management”, “updates”, “European Society of Cardiology”, “American College of Cardiology”, “Brazilian Society of Cardiology” and their respective MeSH terms.

The differences between the guidelines were described and discussed qualitatively, considering the scientific justifications for each medical society's specific recommendations. Because this was a literature review based on public and previously published sources, submission to a research ethics committee was not required, as per international guidelines for narrative reviews.

Articles and guidelines have been included that.

- They presented specific recommendations for the management of acute atrial fibrillation.
- They were published between 2022 and 2025.
- They were available in English, Portuguese or Spanish.

Studies were excluded if

- They referred exclusively to the chronic management of atrial fibrillation.
- They did not present relevant updates or simply replicated previous guidelines without modification.
- They had an exclusive focus on pediatric or pregnant populations.

COMPARATIVE RESULTS

1. Rate Control vs. Rhythm Control

- American Guidelines (ACC/AHA/HRS): Recommend an initial rate control strategy for most patients with acute AF, reserving rhythm control for specific cases, such as symptomatic patients despite adequate rate control or those with heart failure.
- European Guidelines (ESC): Although they also emphasize rate control, they are more likely to consider rhythm control as an initial strategy, especially in newly diagnosed or symptomatic patients, aiming to improve quality of life and cardiac function.
- Brazilian Guidelines (SBC): These are more in line with American recommendations, prioritizing rate control in most cases and reserving rhythm control for specific situations, such as young patients or those with persistent symptoms.

2. Use of Anticoagulants

- American Guidelines: Recommend assessing thromboembolic risk using the CHA_2DS_2- VASc score, with indication of oral anticoagulation for men with a score ≥2 and women with a score ≥3.
- European Guidelines: Similarly, they use the CHA_2DS_2- VASc score, but recommend anticoagulation for men with a score ≥1 and women with a score ≥2, adopting a more aggressive approach to preventing thromboembolic events.
- Brazilian Guidelines: Follow American guidelines, indicating anticoagulation for men with a CHA_2DS_2- VASc score ≥2 and women with a score ≥3.

3. Electrical and Pharmacological Cardioversion

- American Guidelines: Suggest electrical cardioversion as first-line for hemodynamically

unstable patients and consider pharmacological cardioversion in stable patients, depending on comorbidities and duration of AF.
- European Guidelines: Prefer electrical cardioversion for immediate restoration of sinus rhythm, but also recognize the efficacy of pharmacological cardioversion in specific contexts, with a broader list of recommended antiarrhythmic agents.
- Brazilian Guidelines: Recommend electrical cardioversion as the gold standard for unstable patients and consider pharmacological cardioversion in stable patients, with a limited selection of medications due to availability and safety profile.

4. Approach to Hypertension in Patients with AF
- American Guidelines: Set stricter blood pressure targets, recommending values below 130/80 mmHg for most patients, including those with AF.
- European Guidelines: Take a more gradual approach, initially aiming for values below 140/90 mmHg and, if well tolerated, below 130/80 mmHg, especially in younger patients.
- Brazilian Guidelines: Aligned with European recommendations, with similar blood pressure targets, emphasizing individualization of treatment according to the patient's profile.

5. Catheter Ablation
- American Guidelines: Indicate catheter ablation as a first-line option for selected patients with symptomatic paroxysmal AF, especially when there is failure or intolerance to medical therapy.
- European Guidelines: They recommend catheter ablation mainly after failure of drug therapy, but consider it as an initial option in specific cases, such as young patients or those with a clear preference for non-pharmacological interventions.
- Brazilian Guidelines: Generally reserve catheter ablation for patients who have not responded to drug treatment, reflecting considerations of available resources and local expertise.

It is important to note that, despite these divergences, all guidelines emphasize the need for an individualized approach, considering the clinical characteristics of each patient, associated comorbidities, and personal preferences in the management of acute atrial fibrillation.

DISCUSSION

A comparative analysis of American, European, and Brazilian guidelines on the management of acute atrial fibrillation (AF) reveals significant advances and notable differences. Although all are based on robust evidence, the different approaches reflect distinct epidemiological, economic, and structural realities, especially regarding the availability of therapies and healthcare infrastructure.

One of the main points of divergence is the choice between rate control and rhythm control. While European guidelines adopt a more aggressive stance toward early sinus rhythm restoration, American and Brazilian guidelines opt for a more conservative approach, prioritizing rate control as the first-line treatment. This likely reflects differences in the population profile served and in access to procedures such as electrical or pharmacological cardioversion.

The issue of anticoagulation is another critical aspect. The European guideline adopts more sensitive criteria for initiating anticoagulation, suggesting a greater focus on preventing thromboembolic events even in lower-risk patients. The American and Brazilian guidelines, on the other hand, use higher cutoff points for the CHA_2DS_2-VASc score, which may represent an increased risk for certain subgroups, especially in regions where there is chronic undertreatment of anticoagulation, as highlighted in Brazilian data, which indicate that only about 50–60% of eligible patients receive adequate anticoagulation in the country. (Lopes et al, 2021; SBS 2023).

Another point of note is catheter ablation. Although all guidelines recognize its role in refractory cases, American and European guidelines already consider it a first-line indication in specific scenarios. In Brazil, ablation is still treated with greater caution, reflecting the limited availability of specialized centers and unequal access to the procedure.

Differences in hypertension treatment in patients with AF also illustrate this variation. While the United States sets more aggressive targets, Europe and Brazil opt for a stepwise approach, emphasizing personalized treatment.

In general, all guidelines point to the need for individualized management, but clinical practice still faces obstacles related to unequal access to resources, ongoing training of professionals, and adherence to the most recent guidelines.

CONCLUSION

Updates to clinical guidelines over the past three years reflect a global effort to improve the management of acute atrial fibrillation, incorporating new evidence, technologies, and therapeutic strategies. A comparison between the American, European, and Brazilian consensus guidelines demonstrates significant progress, but also highlights significant disparities that should be considered in the clinical context of each country.

In Brazil, despite notable advances, challenges such as anticoagulant undertreatment and limited access to advanced procedures like ablation persist. This reinforces the importance of public policies focused on professional training, expanding access to modern treatments, and strengthening cardiovascular care.

Finally, evidence-based standardization must always consider the local reality and the profile of the patients treated. Individualized strategies, based on the most current guidelines and adapted to the clinical and

structural context, are essential for improving clinical outcomes and reducing morbidity and mortality associated with acute AF.

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