

Research Article

Effectiveness of Amiodarone, Propafenone And Synchronized Electrical Cardioversion for Conversion of Atrial Fibrillation Paroxysm to Sinus Rhythm in Rigas Stradins University Hospital Department of Emergency Medicine

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Atrial fibrillation remains one of the major causes of stroke, heart failure, sudden death, and cardiovascular morbidity in the world. Its incidence increases with age and the presence of structural heart disease. It is a major cause of stroke, especially in the elderly. Additionally, atrial fibrillation is an independent risk factor for ischemic stroke severity and recurrence [6, 2]. Electrical cardioversion and/or antiarrhythmic drugs provide options for clinicians choosing conversion to sinus rhythm [8, 11].

Aim

The aim of the study was to evaluate and compare the effectiveness of amiodarone, propafenone and synchronized electrical cardioversion in converting atrial fibrillation paroxysm to sinus rhythm in emergency department of Rigas Stradins University Hospital. We analyzed 127 patients who received treatment in the emergency department for paroxysms of atrial fibrillation over a period of three years.

Materials and Methods

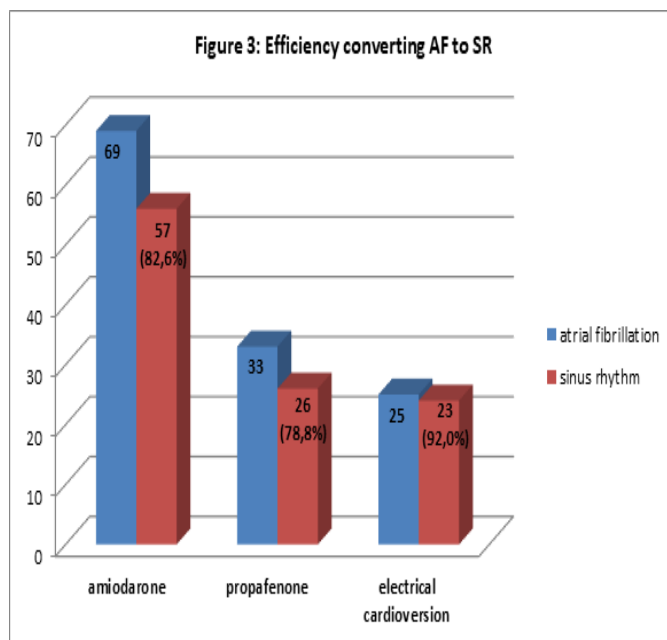
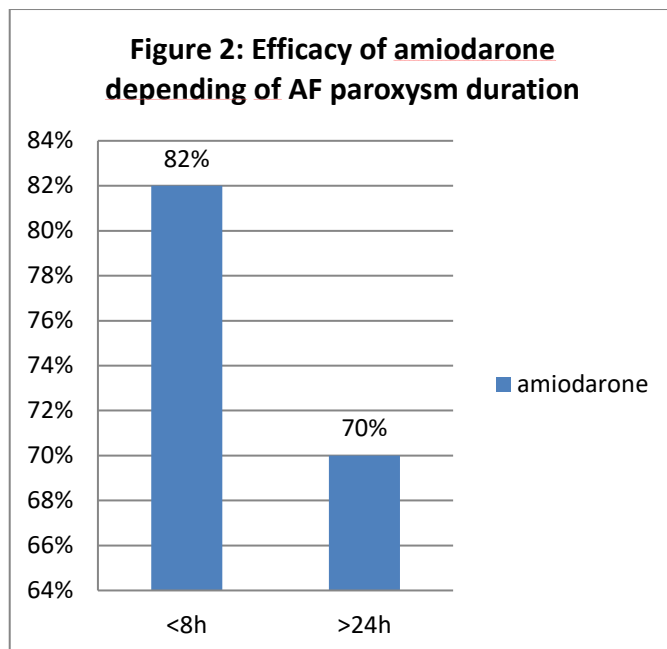
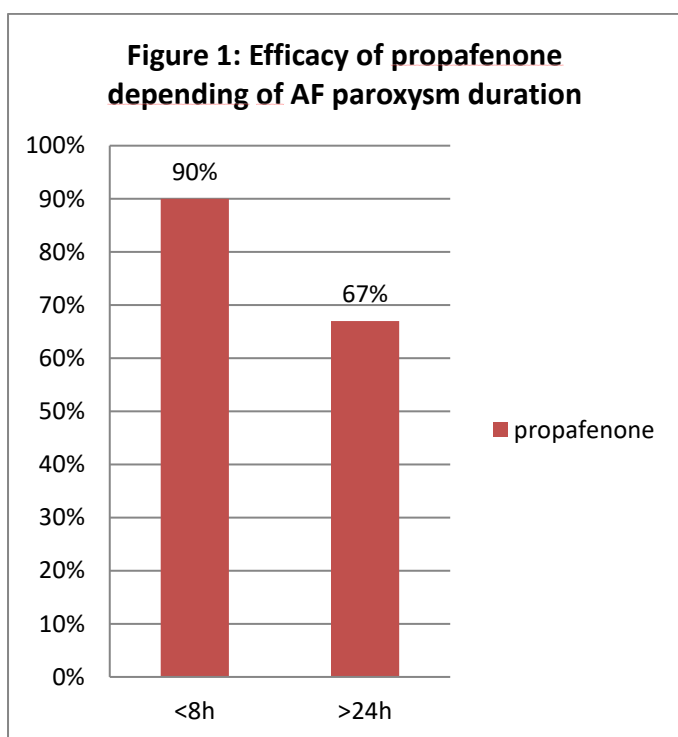
The retrospective analysis was performed on 127 patients (73 men, median age 62, range 37-75, and 54 women, median age 60, range 42-78) (Table 1). duration of atrial fibrillation 48 hours or less (averaged $23,5 \pm 0,8$ h). The patients were divided into three groups – I group of patients were treated by amiodarone i/v (69 patients -54.3%), II group of patients were treated by propafenone i/v (33 patients -26.0%), and for III group electrical cardioversion was applied (25 patients -19.7%). Since the beginning of therapy was repeated ECG registration with measurement of the duration of the complexes and intervals. Measurement of blood pressure and pulse was performed during each hour till conversion of atrial fibrillation to sinus rhythm or within 24 hours. Exclusion Criteria was atrial fibrillation duration of greater than 48 hours, taking antiarrhythmic drugs in the last 24 hours, thyroid disease, patients with heart failure classifications NYHA Class III-IV, congenital or acquired QT elongation syndrome, acute MI or unstable angina [4].

Table 1: Age and gender distribution, (n=127)

Variable	Number (%)
Age ranges (years)	
30-40	14 (11%)
41-50	19 (15%)
51-60	17 (13%)
61-70	29 (23%)
>70	48 (38%)
Gender	
Male	73 (57%)
Female	54 (43%)

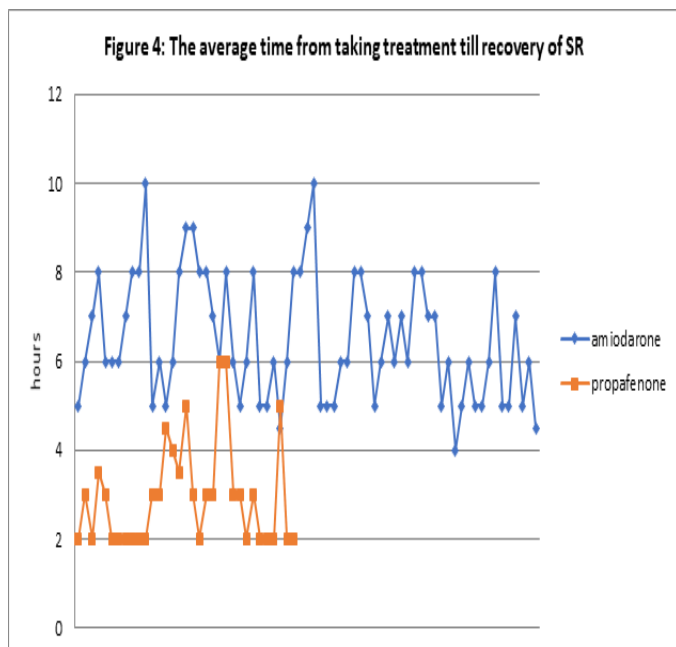
Results and Discussion

Efficiency of amiodarone i/v converting atrial fibrillation to sinus rhythm detected in 56 of 69 patients (81.2%). The average time from taking amiodarone till recovery of sinus rhythm was a 6.5 ± 1.4 hour, the average dose of amiodarone i/v 800 ± 200 mg. ($p=0.03$ compared to propafenone). Efficiency of propafenone i/v converting atrial fibrillation to sinus rhythm detected in 26 of 33 patients (78.8%). The average time from taking propafenone till recovery of sinus rhythm was 2.9 ± 1.2 hours, the average dose of propafenone i/v 90 ± 22 mg. ($p=0.01$ compared to amiodarone). Efficiency of electrical cardioversion was pronounced in 24 of 25 patients (96.0%). ($p<0.001$ compared to both amiodarone and propafenone). In case if atrial fibrillation duration is less than 8h propafenone is more effective (Figure 1) and for atrial fibrillation with duration over 24h more effective is amiodarone (Figure 2). Efficacy of amiodarone and propafenone in converting atrial fibrillation paroxysm to sinus rhythm was almost the same (Figure 3) [3, 15]. The effect of amiodarone was slightly superior that of propafenone [10]. Electrical cardioversion in atrial fibrillation paroxysm is an effective with a high success rate [5, 9, 12]. Corresponded to the population mean values in the treatment of paroxysms of atrial fibrillation [1, 7, 14].



Discussion

The efficacy of amiodarone was 81.2%, propafenone 78.8%, and electrical cardioversion a high 96.0%. It should be noted that the effect of amiodarone was slightly higher than that of propafenone, but the difference between them was not significant. Both drugs can be considered acceptable options for the treatment of atrial fibrillation to restore sinus rhythm [3, 10]. Very interesting was the finding that propafenone had a faster sinus rhythm recovery time (2.9 ± 1.2 hours) compared to amiodarone (6.5 ± 1.4 hours) (Figure 4). This allows us to consider propafenone as a faster-acting drug. In addition, it is worth noting that propafenone was more effective in cases where the duration of atrial fibrillation was less than 8 hours, while amiodarone was more effective when the duration of atrial fibrillation was more than 24 hours [3, 5, 10]. This highlights the importance of taking into account the duration of an atrial fibrillation episode when choosing the optimal treatment.



Electrical cardioversion, in turn, has shown high efficiency in converting atrial fibrillation paroxysms into sinus rhythm. With results showing a success rate of 96.0%, electrical cardioversion has been shown to be reliable and has a high success rate [5, 12]. However, it should be remembered that this method requires special equipment, more detailed preparation of the patient for sedation and qualified personnel.

Based on the results of the study, we draw attention to the importance of taking into account the duration of atrial fibrillation when choosing a method of treatment in emergency care. Clinicians should be aware that for short episodes of atrial fibrillation, propafenone may be the preferred option, while amiodarone may be more effective for long episodes. At the same time, electrical cardioversion remains an effective method in the treatment of atrial fibrillation paroxysms and can be considered as the optimal choice in certain cases [13].

Conclusion

In conclusion, our study helps to better understand the effectiveness of various medications and treatments for paroxysmal atrial fibrillation in the emergency room setting. Amiodarone, propafenone, and electrical cardioversion all three options provide physicians with effective tools to restore sinus rhythm in patients with atrial fibrillation. However, the choice of method should be consistent with the duration of the atrial fibrillation episode, as well as the availability and experience of medical personnel. We hope that this study will provide useful guidance to clinicians making decisions about the management of patients with atrial fibrillation in the emergency setting. Atrial fibrillation duration should be taken into account more often to choose an appropriate treatment in emergency department.

Ethics approval and consent to participate

The study was authorized and approved by the ethical committee of Paula Stradins University Hospital on 23.04.2020. Order No. 2-3/217

All patients whose data were processed previously gave their

consent in written form

Data Availability
As per the requirement for a data availability statement, we confirm that all data underlying the findings of our research article/clinical trial are available. The data is stored securely with the author and adheres to the ethical guidelines set by the research committee. Non-confidential data is accessible through tables and lists utilized for this specific study. For interested readers, we provide where the data is deposited, along with any applicable deposition codes to access the data. We are committed to transparency and reproducibility in our research, and this data availability statement ensures that others can verify and build upon our findings.

Conflicts of Interest

Authors declare no conflict of interest.

Funding Statement

None.

Authors' contributions

M.Tracevskis -analyzed and interpreted the patient data regarding the patients in emergency department with atrial fibrillation and they treatment and was a major contributor in writing the manuscript.

I.Pupkeviča -recommendations for the use of literature and scientific articles for the research of this work

O.Kalējs -scientific consultant in the development of the article
All authors read and approved the final manuscript.

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