Iranian Journal of Emergency Medicine . 2023; 10(1): e8

CASE REPORT

Amiodarone can still be a drug of choice at emergency departments for pre-excited atrial fibrillation even in the face of guidelines prohibition

Babak Payami[1]*, Afshin Zarrin[1], Mofid Hosseinzadeh[2] Habib Haybar[1] Sepideh Khodamoradi[1]

1 Department of Cardiovascular Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

2 Department of Emergency Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Received: February 2023; Accepted: March 2023; Published online: 2 May 2023

Abstract: Electrical cardioversion or intravenous ibutilide are currently recommended as the acute treatment for pre-excited atrial fibrillation. Recent guidelines for this circumstance forbid intravenous amiodarone despite its effectiveness in blocking the accessory pathway and atrioventricular node due to the possibility of ventricular fibrillation. But as our presented case, some physicians continued to favor intravenous amiodarone successfully in a suitable setting.

Keywords: Amiodarone, Pre-excitation, Atrial fibrillation,Wolf-Parkinson-white syndrome

Cite this article as: Payami B, Zarrin A, Hosseinzadeh M, Haybar H, Khodamoradi S. Amiodarone can still be a drug of choice at emergency departments for pre-excited atrial fibrillation even in the face of guidelines prohibition. Iranian Jour Emerg Med. 2023; 10(1): e8. https://doi.org/10.22037/ijem.v10i1.40732.

1. Introduction

Atrial fibrillation (AF) in pre-excitation can lead to fast heart rate, ventricular fibrillation, and cardiac arrest (1). Recent guidelines for this disease when hemodynamic is stable recommend drugs acting on accessory pathway such as ibutilide , procainamide or a class 1C antiarrhythmic agent and forbid IV amiodarone due to the possibility of degenerating the rhythm to ventricular fibrillation, despite the fact that it was previously the drug of choice and the chosen urgent treatment (2, 3). In this report, we show a case of pre-excited AF that, although being in a high risk group, was successfully treated with IV amiodarone in the emergency department (ED).

2. Case Report

A 34-year-old male presented to the emergency department with palpitations starting 1 hour before presentation and on-off retrosternal pain.

The patient had a one-year history of Wolf-Parkinson-White syndrome. Family history was negative for cardiac disease, and habitual history was also negative. On physical examination, the findings were as follows: blood pressure was 120/80 mmHg, pulse rate was 250 / min with irregularly irregular rhythm, the lungs were clear. Complete blood count and electrolytes were at normal range and Electrocardiogram at presentation is shown in Figure 1:

With diagnosis of hemodynamically stable pre-excited atrial fibrillation, 150 mg intravenous amiodarone was infused over 10 minutes, and then, supplemental infusions of 150 mg over another 10-minute period repeated because of no response to first loading dose. The ECG 20 minutes after starting amiodarone infusion is shown in Figure 2:

Forty minutes after amiodarone administration, a sinus rhythm was observed, and the patient became symptom-free. The results of the electrocardiogram are shown in Figure 3:

Amiodarone infusion continued as maintenance dose (1mg/min over 8 hours and then 0.5 mg/min over 18 hours). The patient was discharged in sinus rhythm on the next day and electrophysiological study and manifest right posteroseptal accessory pathway ablation performed after few days successfully.

*Corresponding Author: Babak Payami; Department of Cardiovascular Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. Email: BabakPayami@yahoo.com, ORCID: https://orcid.org/0000-0002-4953-0980.

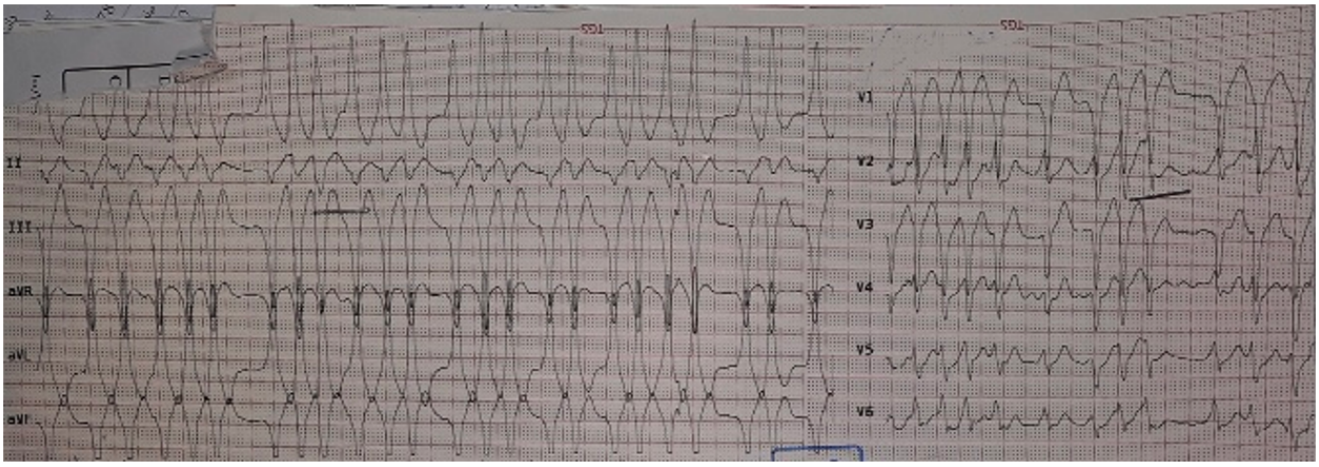

Figure 1: 12-lead ECG showed rapid ventricular response atrial fibrillation and pre-excited wide QRS complexes

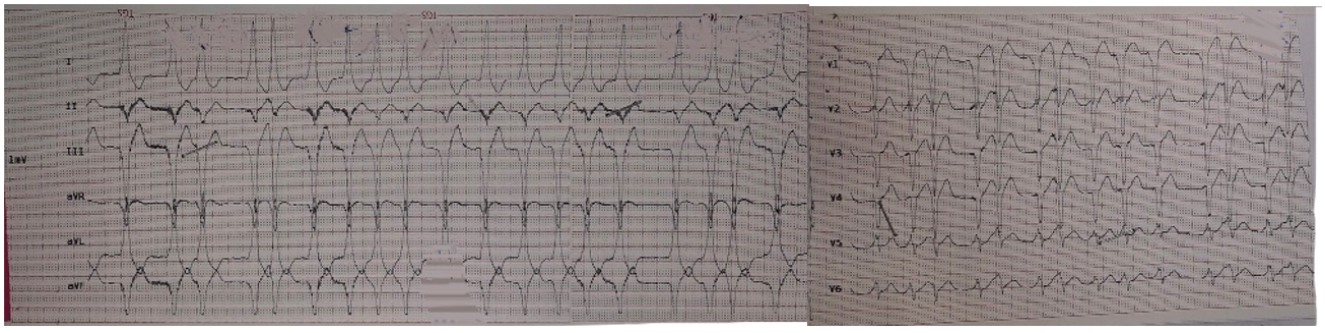

Figure 2: 12-lead electrocardiogram showed pre-excited atrial fibrillation Forty minutes after amiodarone administration, a sinus rhythm was observed, and the

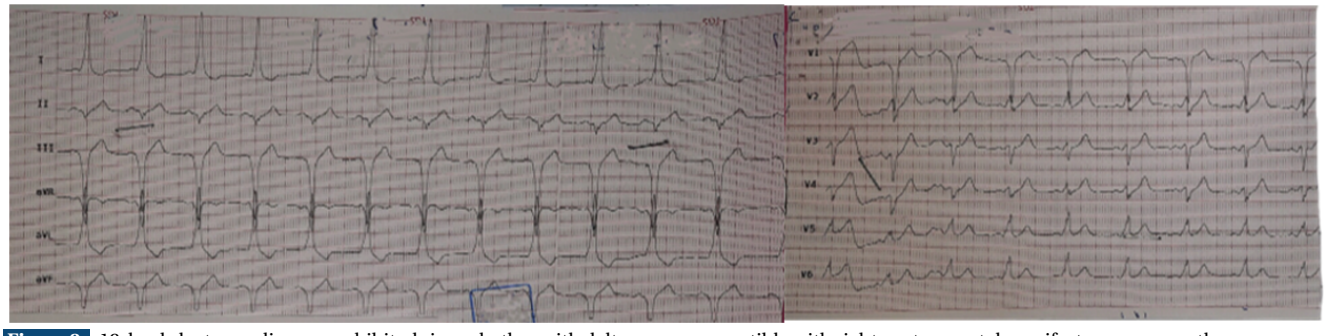

Figure 3: 12-lead electrocardiogram exhibited sinus rhythm with delta waves compatible with right posteroseptal manifest accessory pathway

3. Discussion

Wolff Parkinson White (WPW) patients are more likely than those without organic cardiac disease to have paroxysmal atrial fibrillation (4). Some possibilities, such as the effect of accessory pathways on atrial electrical architecture and enhanced atrial muscle vulnerability, explain the high incidence of paroxysmal atrial fibrillation in WPW syndrome (5). Pre-excited atrial fibrillation can occur in anterogradely conducting accessory pathways in patients with sinus rhythm and resting ECG with pre-excitation. AF's fast ventricular rate (up to 300/min) can worsen hemodynamics and lead to mortality. Accessory pathways can conduct more atrial depolarizations to ventricles than the atrioventricular node due to their short refractory time. Accessory pathways with anterograde effective refractory periods under 250 millisecond may cause harmful fast ventricular response during atrial fibrillation paroxysm (6). Class III antiarrhythmic amiodarone in-

teracts with various ion channels to selectively increase cardiac tissue action potential duration and reduces dispersion of refractoriness. Thus, it stops atrial fibrillation by blocking many micro reentrant circuits in atrial tissue. Also, amiodarone slows AF ventricular response by acting on the atrioventricular node. In hemodynamically stable patients with pre-excited AF, intravenous ibutilide and procainamide disrupt accessory pathway conduction rather than AV node conduction (7). IV amiodarone, which blocks the AV node and accessory pathway, was also indicated for this situation. Due to VF in a few individuals after taking this medication, current guidelines advise against its use (3). However, some researchers believe that VF induction following amiodarone injection depends on accessory pathway ERP and that those with short AP anterograde ERP are at risk (8). They prescribe IV amiodarone for pre-excited AF only if the shortest RR is more than 250 milliseconds. Our patient experienced RVR AF and pre-excitation with the shortest RR of about 220 ms, making him ineligible for IV amiodarone according to current guidelines. However, due to the emergency medicine specialist's preference because of stability of the patient hemodynamics and also availability of amiodarone other than other suitable intravenous drugs, the patient received the IV amiodarone, which was successful in converting the rhythm.

4. Conclusions

This instance suggests that pre-excited atrial fibrillation patients may benefit from intra-venous amiodarone if cardiac resuscitation equipment and trained personals are available.

5. Declarations

5.1. Acknowledgments

Thanks to Dr. Shirin Azizidoost for editing the manuscript

5.2. Authors' contributions

Babak Payami: writing the manuscript and proof outline, Afshin Zarrin: supervised the case follow up, Mofid Hosseinzade: Planned the case emergency department treatment, Habib Haybar: provided critical feedback, Sepideh Khodamoradi: supervised the case treatment.

5.3. Funding and supports

By Ahvaz Judishapur University of Medical Sciences

5.4. Conflict of interest

Authors had no conflict of interest.

5.5. Ethical consideration and patients consent

According to regular consensus of patients admitted at emergency departments.

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