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Letter to the Editor

Amiodarone or lidocaine, that is the question - Pharmacological therapy of refractory ventricular fibrillation associated with Brugada syndrome



To the Editor,

I have with great interest read the latest European Resuscitation Council (ERC) guidelines.¹ Of our particular focus is pharmacological management of refractory ventricular fibrillation (VF) in patients with Brugada syndrome (BrS). In the new 2021 guidelines, it is recommended to use either amiodarone or lidocaine if the former is unavailable. A simultaneous use of both of these medications is not preferred.

Brugada syndrome is a genetic disorder which is inherited in an autosomal dominant pattern with incomplete penetration and mainly affects cardiac sodium channels.^{2,3} This leads to an abnormal cardiac conductivity that in turn may lead to dysrhythmias and sudden cardiac death. Furthermore, Brugada syndrome predisposes to VF which may also be refractory.⁴

While the literature on this particular subject is sparse, I would like to share my experience related to the pharmacological therapy of refractory VF associated with Brugada syndrome. With a higher prevalence of BrS in the area that is covered by my institution, I recorded 15 cases of refractory VF attributable to Brugada syndrome which were systematically collected over a 10-year period. Patients' characteristics are presented in Table 1. A routine ERC protocol for cardiopulmonary resuscitation (CPR) was followed in all cases. A standard dose of amiodarone was administered as a treatment of refractory VF. Such an approach was unsuccessful in all but one case. In the remaining cases a senior clinical decision was made to administer additionally 100 mg lidocaine IV. This resulted in a return of spontaneous circulation (ROSC) within one cycle of CPR in the remaining 14 cases. Of the 15 patients, there were thirteen survivors. There were no major neurological sequelae among the survivors and minor ones resolved during hospitalisation. In one case of a peri-operative cardiac arrest, ROSC was achieved after 68 minutes of continuous refractory VF. This patient fully recovered with no neurological deficit and was later managed in the acute cardiology/haemodynamic unit with an implantation of an ICD (Implantable Cardioverter-Defibrillator) device.

All cases of BrS were confirmed in line with the second Brugada consensus statement.⁵ The vast majority of cases (eleven patients) were diagnosed after the event i.e. VF. Four of the patients were known to have Brugada syndrome prior to cardiac arrest.

The properties and mechanisms of action of the two medications used have been relatively well described. Lidocaine is a class Ib antiarrhythmic and blocks the fast voltage-gated sodium channels.

Amiodarone is primarily a class III antiarrhythmic. Its other properties include blocking beta-adrenergic receptors, calcium channels as well as sodium channels.

Brugada syndrome is predominantly a sodium channel-related pathology. I assume that given the nature of BrS and possible pharmacological treatment options of the Brugada syndrome-associated refractory VF, lidocaine alone or in combination with amiodarone would be a better choice that potentially could improve outcome. There are certain limitations of my observations which include a small sample size and difficulty in confirmation of BrS when ECG is used as many clinical conditions may mimic the BrS ECG patterns.^{6,7}

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Table 1 – The general characteristics of the study population.

Patients' Characteristics	Value
Number	15
Age (years) range, mean ± SD	27–52, 38.1 ± 6.9
Gender (F/M)	4/11
Family history	6
Initial (baseline) ECG:	
Type 1	11
Type 2	4
Pharmacological therapy and ROSC:	
Amiodarone	1
Amiodarone followed by lidocaine	14
Survivors	13
ICD implantation	13

SD - Standard Deviation, ICD - Implantable Cardioverter-Defibrillator, ROSC - Return of Spontaneous Circulation.

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