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Special Article

Safety and Effectiveness of Oral Quinidine in Cardioversion of Persistent Atrial Fibrillation

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Abstract

Objectives. The effectiveness of oral quinidine for conversion of atrial fibrillation to sinus rhythm was evaluated in 49 patients with persistent atrial fibrillation on anticoagulation therapy. Atrial fibrillation was considered as persistent when the duration was longer than 3 days but less than 6 months.

Methods. Patients received orally one to 7 doses of 150 mg hydroquinidine hydrochloride every one hour until restoration of sinus rhythm, or to a maximum of 7 tablets. Patients who were not converted underwent elective electrical cardioversion.

Results. Thirty-nine of 49 patients(79.6%)were converted with quinidine and only one of the remaining 10 was converted with electrical cardioversion. Quinidine had no significant effect on blood pressure or unexpected changes on the QRS duration and the QT interval. Four patients developed gastrointestinal symptoms(8.1%).

Conclusions. Oral quinidine was safe and effective in the conversion of persistent atrial fibrillation to sinus rhythm.

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Key Words

■**Atrial fibrillation** ■**Antiarrhythmia agents(quinidine)** ■**Anticoagulants**

INTRODUCTION

Atrial fibrillation has emerged as the most common cardiac arrhythmia requiring therapy[1].

Many pharmacological agents have been used for the conversion of persistent atrial fibrillation to sinus rhythm with variable rates of success[2]. It appears, however, that not a single pharmacologic agent is clearly superior to any other for this purpose. Quinidine has been reported to have a wide range of success rates from 30% to 90% in heterogenous populations[3,4].

The present study was undertaken to define the efficacy and safety of oral quinidine for the conversion of persistent atrial fibrillation to sinus rhythm. For the purpose of this study persistent atrial fibrillation was defined when its duration was greater than 3 days but shorter than 6 months.

METHODS

Forty-nine consecutive patients(24 men and 25 women)admitted in the Division of Cardiology of the Second Idrima Kinonikon Asfaliseon Hospital, Thessaloniki, Greece, with persistent atrial fibrillation were studied prospectively(**Table 1**). Onset of atrial fibrillation was considered at the time when

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Table 1 Clinical characteristics of patients studied

Mean age (yr)	63.42 (range 45 to 78)
Mean duration of persistent atrial fibrillation (days)	69.94±58.25
Mean left atrial size (mm)	43.41±4.44
Mean systolic blood pressure (mmHg)	137.1±16.15

Values are mean ±SD.

patients became symptomatic and started to complain of palpitations. Atrial fibrillation was documented by 12-lead electrocardiogram on the day of admission in all patients. Patients with valvular heart disease were excluded prior to entry into the study. Serum potassium, sodium, and thyroid function tests were within normal limits on the day of admission in all patients. Twenty-one of the patients had a history of arterial hypertension, 7 had coronary artery disease, and 6 had diabetes mellitus. Patients did not receive any antiarrhythmic therapy prior to admission in the hospital and all were on chronic anticoagulation therapy (>4 weeks) with an international normalized ratio (INR) 2.5−3 times above normal control.

Two-dimensional, M-mode echocardiography, and Doppler echocardiography were performed in all patients with Acuson 128 XP echocardiographic machine with a 2.5 MHz transducer using standard techniques as recommended by the American Society of Echocardiography[5]. Five consecutive cardiac cycles were used for analysis and the values were averaged. Left atrial and ventricular diameters were measured by two-dimensional directed M-mode echocardiography. None of the patients had mitral stenosis, or significant mitral regurgitation (greater than +1) as defined by Doppler echocardiography.

Electrocardiographic monitoring was maintained during the entire study. A 12-lead electrocardiogram was recorded every 30 min for the analysis of QRS and QT intervals. The duration of QT interval of 10 successive beats was measured and the results were averaged. The QT interval was corrected as described previously by Boudoulas *et al.*[6] and the QT index (QTI) was obtained. Brachial artery pressure was measured every 15 min by sphygmomanometry.

Hydroquinidine hydrochloride, 150 mg tablet, was given orally every one hour until restoration of sinus rhythm or to a maximum amount of 7 tablets (1,050 mg). Patients who were not converted after 7 oral doses of quinidine underwent elective electrical cardioversion.

Patients who restored sinus rhythm received on discharge 150 mg of propafenone three times a day and continued anticoagulation therapy for a minimum of 4 weeks.

Statistical evaluation was performed using the Student *t*-test and chi-square analysis.

RESULTS

Conversion to sinus rhythm was obtained in 39 patients (79.6%). The mean conversion dose of quinidine was 4.7 tablets (705 mg) in 4.7 hours.
The 10 patients who remained in atrial fibrillation after administration of 7 tablets of quinidine hydrochloride underwent synchronized electrical cardioversion; only one of them converted to sinus rhythm.

The conversion to sinus rhythm was not related to the duration of atrial fibrillation, left atrial size or the coexisting cardiac diseases (**Table 2**).

Quinidine had no significant effect on blood pressure or unexpected effects on the QRS duration and the QT interval (**Table 3**).

Four patients developed gastrointestinal symptoms (8.1%); in only one of them was the treatment discontinued because of side effects.

DISCUSSION

This study demonstrated that a high rate of conversion to sinus rhythm occurred with quinidine in a group of patients with persistent atrial fibrillation.

Quinidine is a sodium channel blocking class Ia antiarrhythmic agent which has been used extensively in the treatment of atrial and ventricular arrhythmias, especially in patients with atrial fibrillation or atrial flutter, often in combination with verapamil or digoxin[7−9].

Other pharmacologic agents also have been used for conversion of atrial fibrillation with variable rates of success. Amiodarone, a class III drug, has been reported to be effective in restoring sinus rhythm in 48% to 81% of patients with atrial fibrillation[10,11]. It was usually administered as a high oral dose and occasionally intravenously. Amiodarone and quinidine plus verapamil had similar rates of success, 60% and 55% respectively, in terminating persistent atrial fibrillation (4 weeks to 2 years duration)[12]. Amiodarone was also effective in restoring sinus rhythm in approximately 50% of the patients with persistent atrial fibrillation refrac-

Table 2 Characteristics of patients converted

	Conversion to sinus rhythm (n=39)	No conversion to sinus rhythm (n=10)	p value
Mean duration of atrial fibrillation (days)	68.7	73.6	NS
Mean left atrium size (mm)	43.45	43.25	NS
History of arterial hypertension (% patients)	43	40	NS
History of coronary artery disease (% patients)	13	20	NS

Table 3 Systolic blood pressure, QRS duration, and QT index in patients treated with quinidine

	Systolic blood pressure (mmHg)	QRS duration (msec)	QT index (msec)
Baseline values	137.1±16.5	72.6±6.65	388.5±24.74
Quinidine	129.2±12.5	73.2±6.62	402.1±25.15*

Values are mean ±SD. *p<0.001.

tory to therapy with quinidine[13].

Propafenone, a class Ic pharmacologic agent has been used in different doses orally or intravenously, for conversion of atrial fibrillation to sinus rhythm with success rates from 55% to 81%[14,15]. There is still no agreement about the optimal doses of propafenone for conversion of atrial fibrillation to sinus rhythm. One oral dose of 600 mg is considered to be effective for this purpose.

Studies also have shown that quinidine was more effective than sotalol in conversion of paroxysmal atrial fibrillation to sinus rhythm (86% vs 52%)[16,17]. Quinidine was also more effective than sotalol in conversion of persistent atrial fibrillation (mean duration of 45 days) to sinus rhythm with rates of success 60% vs 20%[18].

We found that left atrial size and arrhythmia duration did not influence the therapeutic response in this selective population. In previous studies, however, where propafenone or amiodarone were used, the duration of atrial fibrillation was longer, and the left atrial size was greater in those patients in whom atrial fibrillation was not converted to sinus rhythm[19–22]. In the present study, the duration of arrhythmia was less than 6 months and the atrial size was not markedly large.

Minor side effects related to therapy with quinidine were seen, however, only in one patient discontinuation of therapy was necessary. It is important to emphasize that patients who were refractory to therapy with quinidine were also refractory to electrical cardioversion.

CONCLUSIONS

Our study, although performed in a rather small number of patients, suggests that oral quinidine can be used for the conversion of persistent atrial fibrillation to sinus rhythm, because it is effective and safe.

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