Treatment of Chronic Atrial Fibrillation with Cardioverter

KOHEI AZUMA

ALTHOUGH quinidine has been widely used for treatment of chronic atrial fibrillation, more advantageous measure for defibrillation has been desired because this drug has unfavorable side effects.

In 1962 LOWN described the use of synchronized direct current countershock ("cardioversion") for elimination of ventricular fibrillation, and this method was proved to be effective in a series of various arrhythmias, especially atrial fibrillation, showing very excellent results. Since then cardioversion has been widely employed, occupying an important place in treatment of atrial fibrillation and other tachycardiac ectopic arrhythmias. This method has following advantages: 1) instantaneous effect of conversion, 2) relative safety, 3) high rate of success, 4) absence of severe discomfort of patients and 5) avoidance of possible toxic effects of the drugs.

METHODS

After quinidine sulfate was given in a dose of 0.3 g, 3 times daily for two days, cardioversion was carried out on the hospitalized patients in the recovery room for surgery. Anticoagulants were also medicated. Digitalis, if used before cardioversion, was given up 24 hours prior to the procedure. Anesthesia for a short time was induced with intravenous thiopental sodium. During con-

version blood pressure was measured frequently and electrocardiogram was used as a monitor to check the ventricular rate or other abnormalities. The electrodes for countershock were placed in antero-lateral position. The countershock was begun at 200 watt-sec as a rule, and, if ineffective, was raised up stepwise to 400 watt-sec until regular sinus rhythm was obtained. After observing about half an hour, the patient returned to the ward to keep bed rest for three hours, and was discharged after two to ten days.

The materials and the results of our study are summarized in Table I and the results of follow-

TABLE I

Total	71 patients
males	49
females	22
Age	18-77 yrs. (average of age 51.5 yrs.)
Diseases	
Valvular disease	24 patients
Hypertension	17 patients
Arteriosclerosis	21 patients
Hyperthyroidism	2 patients
Idiopathic cardiomegaly and others	7 patients
DC shock	Total 126 episodes
success	64 (90.1%)
failure	7

TABLE II

Duration of atrial fibrillation before treatment	Patients	Recurrence to atrial fibrillation				Maintenance of sinus rhythm
		within 7 days	8-30	31-180	over 181 days	
≤1 year	19	6	1	3	2	5
1-5 years	27	11	3	5	1	5
5-10 years	12	7	1	0	1	2
over 10 years	13	5	4	0	0	2
Total	71	29 (58%)	9 (18%)	8 (16%)	4 (8%)	14

Department of Internal Medicine, Tokyo Medical College, Tokyo

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up study (recurrence of atrial fibrillation or maintenance of sinus rhythm) are shown in Table II and Fig. 1.

Fig. 1.

INDICATION FOR CARDIOVERSION

It has been generally accepted that atrial fibrillation of long duration (over 5 years), or associated with marked cardiac decompensation or severe valvular disease (especially mitral), are hard to be converted to sinus rhythm by antiarrhythmic drugs. However, even such cases were successfully converted by DC countershock, with maintenance of sinus rhythm thereafter. Whether

the nature of the cardiac disease is rheumatic, ischemic or hypertensive, did not seem to have significant relationship to the conversion to or maintenance of sinus rhythm. Age and sex also had no relationship. However, in the cases of marked dilated right auricle or marked enlarged heart exceeding cardiothoracic ratio of 55%, sinus rhythm was difficult to be maintained, suggesting that these states are not indicative of cardioversion.

USE OF QUINIDINE AFTER CARDIOVERSION

Although the excellent results of cardioversion was obtained, as shown in Fig. 1, atrial fibrillation recurred in not a few cases, especially within the first week after conversion. It probably means that predisposition of atrial muscle for fibrillation ("Flimmerbereitschaft") remains unchanged even after restoration of sinus rhythm.

The duration of maintained sinus rhythm was varied in wide range from one day to over six months in successful cases. However, recurrence of atrial fibrillation was observed to be diminished in proportion to the length of maintenance of sinus rhythm. This suggests that the predisposition for fibrillation becomes less distinct with continuation of sinus rhythm. Therefore, it seems reasonable that, up to the end of first week after cardioversion, a relatively high dose of quinidine (0.2 to 0.3 g of quinidine sulfate, 4 times daily) is given for protection against atrial fibrillation, and in cases in which sinus rhythm is maintained over one month, dose of quinidine can be reduced and at last discontinued. However, the most adequate dose and the proper duration of quinidine medication cannot be determined, since plasma level of quinidine and its amount accumulated in myocardium are not always proportional to the given dose.