Transvenous low energy internal cardioversion for atrial fibrillation refractory to external cardioversion: do non-obese patients benefit?

D Pavin, H Legrand, C Leclercq, C Crocq, P Mabo, J C Daubert

RESULTS

Fifty nine consecutive patients with AF refractory to EEC (50 men; age 62 (10) years) underwent internal cardioversion. Body weight was 91 (19) kg (57-140 kg). The median duration of the current AF episode was four months (eight days to 108 months). AF was idiopathic in 18 patients (31%), mainly hypertension (n = 25). Left ventricular ejection fraction (LVEF) was 0.48 (0.11) and left atrial diameter was 49 (8) mm.

Sinus rhythm was restored by LEIC in 45 patients (76%) with a mean energy of 7.3 (3.1) J. There were no significant differences between the patients in whom internal cardioversion was successful or unsuccessful regarding sex, age, weight, duration of AF, structural heart disease, LVEF or left atrial diameter.

The mean follow up duration of the 45 patients whose sinus rhythm was restored by LEIC was 18 (3) months (2–34 months). Antiarrhythmic drugs prescribed after cardioversion (physician’s preference) included amiodarone in 23 patients (51%), flecainide in 9 patients (20%), sotalol in 8 patients (18%), and no treatment in 5 patients (11%). AF recurred in 23 patients (51%). The proportion of patients without AF recurrence was 55 (7%) after one year, 49 (8%) after two years, and 39 (11%) after three years. No predictors of subsequent AF recurrence could be determined in a multivariate analysis of clinical (sex, age, weight, duration of AF, New York Heart Association functional class, structural heart disease, amiodarone treatment) or echocardiographic variables (LVEF, left atrial diameter).

DISCUSSION

Successful cardioversion depends on the nature of the underlying heart disease and the current density delivered to the atrial myocardium. The latter, in turn, depends on...

Abbreviations: AF, atrial fibrillation; EEC, external electrical cardioversion; LEIC, low energy internal cardioversion; LVEF, left ventricular ejection fraction.
transthoracic impedance which is correlated to the increase in thoracic diameter and body size. Thus, body weight has been recognised as a factor of external shock failure. Obese patients are considered as good candidates for internal cardioversion because the failure of external cardioversion is merely linked to an “extrinsic” technical factor—that is, the low current density delivered to atrial tissue. Furthermore, it is generally thought that external cardioversion failure in non-obese patients is mainly related to “intrinsic” factors, which are more dependent on the electrophysiological substrate or underlying heart disease, as well as on episode duration or atrial size. Those factors should be associated with more AF recurrences provided sinus rhythm can be restored first.

In this study, we did not find any significant difference between obese and non-obese subjects admitted for internal cardioversion. If the immediate success of internal cardioversion appeared greater in obese patients (83%), the difference with non-obese patients, whose sinus rhythm was restored in two thirds of cases, was not significant (p = 0.15). Lastly, we did not find any significant difference in AF recurrence risk between obese and non-obese patients. So, on the basis of our study, the effectiveness of internal cardioversion appears not to be closely related to body weight and therefore should not be reserved for obese people.

A monophasic shock waveform was used for external cardioversion in the study. Use of a biphasic waveform would likely necessitate internal cardioversion less frequently and the effectiveness of LEIC will undoubtedly need to be reassessed in such a context.

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