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Electrical cardioversion for supraventricular arrhythmias in octagenarians

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Atrial fibrillation (AF) is the most common arrhythmia in the elderly and its incidence increases with aging.[1] Electrical cardioversion is used as a strategy for rhythm control in patients with supraventricular arrhythmias. In octagenarians, there are challenges associated with the indication for electrical cardioversion, such as the use of appropriate sedation and anticoagulant agents. Most decisions in clinical practice for these patients derive from observational data and personal experience, since octagenarians represent a minority of patients included in randomized clinical trials. Little evidence is available regarding the clinical context of electrical cardioversion in this vulnerable population. Therefore, we aimed to describe the clinical profile of octagenarians undergoing electrical cardioversion in a cardiology reference center from 2014 to 2018.

We included consecutive patients aged > 80 years who underwent electrical cardioversion for supraventricular arrhythmias in the emergency department of the Samaritano Paulista Hospital, which is a cardiology reference center, from 2014 to 2018. We performed a retrospective data collection, which included details on patient characteristics, indication for the procedure, ecocardiography data, sedation, use of anticoagulants, hospitalization duration, and vital status in 30 days. The institutional ethics committee approved this study, and written informed consent was waived since the data collection was done retrospectively and patient identity was hidden.

A total of 45 patients were included. Among them, six underwent more than one electrical cardioversion. Of these, four underwent a second procedure less than one year after the first. Mean age was 84.1 ± 3.5 years and 52.8% were female sex. The mean CHA_2DS_2-VASc score was 3.9. Among the 51 cardioversion procedures in the study period, AF or flutter were the pre-cardioversion rhythm in 92.2% of the cases, and atrial tachycardia was present in the remaining. A total of 27.5% (n = 14) were hospitalized when electrical cardioversion was needed. Most patients (80.4%) had symptoms for more than 48 hours and a transesophageal echocardiogram was performed in 94.1% of the cases. Median left atrium size was of 48 mm and ejection fraction 54.5%. Valvular disease was present in 27.5% of patients.

Chronic anticoagulation before electrical cardioversion was used in 60.8% (n = 31). Among those, non-vitamin K antagonists were used in 90.3%, and warfarin in the others. Propofol was the most utilized anesthetic agent (86.3%, n = 44), in a mean dose of 31 mg or 0.47 mg/kg. Etomidate and fentalyl were also utilized (11.8% and 7.8%, respectively). Amiodarone was used in 37.3% (n = 19). More than one shock was applied in 17.7% (n = 9). A total of three patients did not present reversion for sinus rhythm immediately post-cardioversion. Median in-hospital stay for outpatients was 1.7 days. Among outpatients, only one needed to be hospitalized after electrical cardioversion. Pacemaker implantation was not needed for any of the patients included. Anticoagulants were prescribed after electrical cardioversion in 49 (96.1%) cases: 44 used non-vitamin K antagonist oral anticoagulants and 5 used warfarin. Anti-arrhythmic drugs were prescribed in 35 (68.6%) patients. All patients included were alive at 30 days after electrical cardioversion.

Our study describes the clinical profile of octagenarians undergoing electric cardioversion in a cardiology reference center in a 4-year period. First, we observed that most patients had symptoms for more than 48 hours and a transesophageal echocardiogram was performed in almost all cases. Propofol was the most commonly used anesthetic agent. Few patients did not present reversion for sinus rhythm and only one outpatient needed hospitalization after electric cardioversion. Oral anticoagulation was prescribed for al-

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most all patients after electrical cardioversion, and most of them received non-vitamin K antagonist oral anticoagulants. Importantly, median in-hospital stay for outpatients was less than two days and all patients were alive at 30 days.

Current guidelines recommend treatment with oral anticoagulants for three weeks before electrical cardioversion or the use of transesophageal echocardiogram to exclude the presence of left atrial thrombus.[2] We observed that most patients in this study had symptoms for more than 48 hours and a transesophageal echocardiogram was performed in almost all of them. This could be partially explained by the fact that 27.5% of patients were hospitalized when electrical cardioversion was needed and this imaging method is easily available in our institution. Propofol was frequently chosen for sedation before electrical cardioversion. The recommended dose for induction of anesthesia in the elderly is between 1.0 mg/kg and 1.5 mg/kg since this population is particularly vulnerable to side effects such as hypotension.[3,4] The mean dose used for sedation in our study was 0.47 mg/kg, which suggests that octagenarians may need low doses of propofol for electrical cardioversion since the duration of the procedure is short.

Our patient population had a high risk for thromboembolic events since the mean CHA_2DS_2-VASc score was 3.9. Approximately 60% of patients were using anticoagulants before the electrical cardioversion procedure, which shows the underuse of this agents in octagenarians and probably reflects the fear for bleeding in this population. The non-vitamin K oral anticoagulants have been shown to be safer than warfarin regarding hemorrhagic events. The ARISTOTLE trial compared apixaban with warfarin in 18201 patients with AF and at least one risk factor for stroke.[5] A third of patients included were aged > 75 years and 13% were older than 80 years. It was shown that the benefits of apixaban over warfarin in preventing embolic events and bleeding were consistent regardless of age.[6] Importantly, one of the criteria for using the reduced dose of apixaban (2.5 mg twice daily) is age > 80 years. The other main clinical trials which compared dabigatran,[7] rivaroxaban,[8] and edoxaban[9] with vitamin K antagonists in this context showed consistent results irrespective of age. We indeed observed that most patients received anticoagulants after electrical cardioversion and were treated with non-vitamin K antagonist oral anticoagulants, which highlights the increasing use of these agents in the elderly.

A prior study included 31 patients with AF admitted to a day-hospital for this procedure with a mean age of 78 years.[10] It was shown that the procedure was effective in 90.3% of the cases, and half of them were in sinus rhythm six months later. In our study, only three patients did not present reversion for sinus rhythm immediately post-cardioversion. Importantly, median in-hospital stay for outpatients was less than two days and all patients were alive at 30 days. These findings suggest that, although there are challenges related to anticoagulant therapy and sedation, electrical cardioversion is a safe procedure in octagenarians when correctly indicated and carefully performed.

In conclusion, the experience of a cardiology reference center showed a short in-hospital stay and a high rate of reversion for sinus rhythm after electrical cardioversion for supraventricular arrhythmias in octagenarians. Managing supraventricular arrhythmias in the elderly is a challenge and this vulnerable population is frequently present in emergency rooms. Therefore, further studies are needed to generate high quality evidence to guide treatment decisions in this population.

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