

Emergency Medicine Journal Club: Eastern Virginia Medical School

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CITATION: Cardioversion of acute atrial fibrillation in the emergency department: a prospective randomized trial; Bellone A, Etteri M, Vettorello M, et al. Emergency Medicine Journal (Mar 2011)

Clinical Scenario: You are working in an ED when an otherwise healthy Urology resident shows up...

P: In stable patients presenting to the ED with new onset AF

I: Is electrical cardioversion more effective

C: compared to pharmacological cardioversion

O: in terms of conversion of AF to sinus rhythm

I. WHAT IS BEING STUDIED?	Efficacy and safety of electrical cardioversion compared to IV propafenone in otherwise healthy ED patients with new onset AF.
1. Study Objective	To determine, in an adequately powered trial, whether EC would improve the rate of success in converting AF to sinus rhythm.
2. Study Design	Prospective, single center, randomized trial, conducted over 2 year period at community hospital with 47K volume in Italy. Pts randomized to receive either PC or EC. All underwent bedside echo to rule out L atrial abnormalities or valvular disease
3. Inclusion Criteria	>18 years old, presenting with AF lasting less than 48 hours.
4. Exclusion Criteria	AF lasting more than 48 hours, hemodynamic instability (SBP less than 90 or DBP less than 50, any valvular disease on echo, acute onset of AF due to ACS, electrolyte disturbances, sepsis, fever, hypothermia, untreated hyperthyroidism, daily home therapy with antiarrhythmic drugs, CHADS2 score 2 or greater (CHF, HTN, age >75, DM, previous TIA or

	CVA). Unclear duration of symptoms assumed to be >48hrs in duration
5. Interventions Compared	Electrical cardioversion (synchronized biphasic sequential shock 100-150-200J PRN) compared to IV propafenone (2mg/kg over 10 minutes)
6. Outcomes Evaluated	<p>Primary endpoint: successful cardioversion (return to SR within 6h from beginning of PC demonstrated by EKG and subsequent d/c)</p> <p>Secondary endpoints: adverse events (hypotension, O2 sats less than 90%, arrhythmia, syncope, QT prolongation, recurrence of AF during 2 months of f/u, time spent in ED)</p>
II. Are the results of the study valid?	
1. Was the assignment of patients randomized?	Yes, according to an algorithm, however they do not discuss this randomization algorithm <i>at all</i> . Randomization via sealed envelope (age, sex, weight, comorbidities, medications) though this seems to be open to compromise (deliberately selecting envelopes out of order, postponing recruitment until desired patient presents, even seeing through envelopes, etc.)
2. Were all patients who entered the trial properly accounted for and attributed at its conclusions?	Yes, including adverse events, no patients dropped out of study. They did not discuss, however, how many patients declined to enter the trial due to the potential for being shocked
3. Was follow-up complete?	This was a limitation of this study- 41% of PC and 25% of EC patients lost to follow-up! Como area evidently high vacationing population living in 2 nd homes. Repeat EKG 60 days post-randomization to assess for SR evidently difficult in this population.
4. Were patients, health workers and study personnel “blind” to treatment?	Would be impossible to blind patients given nature of treatment No other blinding occurred which they admit “can be significantly influenced by

	investigator bias.” This seems to be a weakness that could be improved upon for further studies. This is especially problematic as they were out to prove from the beginning that EC was superior. Could have possible used an arm comparing rate control to propafenone? Perhaps at least blinding the assessors would have been useful.
5. Were study groups similar at the start of the trial?	Yes, very similar- randomized according to an algorithm that accounted for factors such as age, sex, weight, comorbidities, medications, clinically no differences between the two groups- 247 pts in all. They <i>do not</i> specify what this algorithm entailed.
6. Aside from the experimental intervention, were the groups treated equally	Yes.
III. What were the results?	
1. How large was the treatment effect? (difference between treatment and control group).	Success in converting to SR occurred in 89.3% EC group, 73.8% in PC group
2. What was the estimated treatment effect at a 95% confidence interval?	HR 0.34; 95% CI 0.17 to 0.68; p=0.02 The hazard ratio describes the relative risk of the complication based on comparison of event rates. Hazard ratios have been used to describe the outcome of therapeutic trials where the question is to what extent treatment can shorten the duration of the illness. Hazard ratio>1= there is a difference between the 2 groups, and that it is a causative effect. Hazard ratio<1= there is a difference between the 2 groups, but it's a protective effect. HR=1 no difference Perhaps this could have been more clearly illustrated with relative risk reduction (of persistent AF) instead of in HR format.
IV. Will the results help me in caring for my patients? (applicable?)	Possibly, shows EC as a safe and viable option when compared to PC (using this specific drug) to restore sinus rhythm and as a means to reduce time spent in ED. The methodological flaws however are significant.
1. Were all clinically important outcomes considered?	Yes. primary outcomes of successful conversion to sinus rhythm and then secondary outcomes including adverse effects (no statistically significant though

	higher in PC group), time spent in ED (median 180min in EC group vs 420 min in PC group)
2. Are treatment outcomes worth the potential harms?	Yes, adverse events were uncommon and included hypoxia, flutter, hypotension, lower in EC group, but this was not statistically significant.

Clinical Bottom Line:

Controversy remains regarding the optimal strategy for cardioversion in the stable patient population with early atrial fibrillation. This is the first study to randomly compare electrical and pharmacological cardioversion as first line treatments for early atrial fibrillation in the ED. Though it does suffer from limitations regarding blinding and poor follow-up, this study suggests electrical cardioversion may be a more effective first line therapy and may be considered in discussion with patients. Compared to the pharmacological option offered in this study, electrical cardioversion appeared to be safe, showed similar rates of maintenance of sinus rhythm at follow up interval, and as a secondary outcome appears to be reduce time spent in the ED by these patients. This study is a good starting point, but further randomized controlled studies should be performed in this area with improved follow-up, blinding, and comparison of different pharmacologic agents to electrical therapy are needed to support the use of electrical cardioversion as first line therapy in the otherwise stable patient who presents to the ED in early atrial fibrillation.