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Brief Reports

Performance of an expedited rhythm control method for recent onset atrial fibrillation in a community hospital☆,☆☆,★

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ABSTRACT

Background: A standard approach to recent onset atrial fibrillation (AF) in the emergency department (ED) in the United States has not been established.
Purpose: The purpose of this prospective clinical trial was to determine how an ED protocol emphasizing rhythm control for recent onset AF compared similar patients receiving standard therapy in the same facility.
Methods: We enrolled consecutive patients presenting to our community hospital with recent onset AF into a protocol, which called for rhythm control with procainamide and if unsuccessful electrical cardioversion and discharge home. We compared this prospective cohort with matched historical controls. Primary outcome was admission rate. We also compared ED conversion rates and lengths of stay (LOS). We reported 30-day data on the study group including ED recidivism, recurrent AF, outpatient follow-up, and any important adverse events.
Results: Fifty-four patients were enrolled in the study group with 4 being admitted compared with 30 of 50 in the historical control group. Ninety-four percent of the study group converted compared with 28% in the historical control. Both hospital and ED LOS were significantly shorter for the study group. Six patients had recurrent AF, and 4 of those returned to the ED.
Conclusion: An ED protocol that uses rhythm control decreased hospital admission and LOS, and there were no adverse events at 30 days.

1. Introduction

1.1. Background

Standard approach in the Unites States to patients with atrial fibrillation (AF) differs from that of many other countries. Patients are often admitted to the hospital and treated with rate control, anticoagulation, and inpatient cardioversion. Outside the Unites States, there is usually a very different approach to the patient with recent onset AF, defined as AF less than 48 hours' duration [1]. This typically involves an emergency department (ED) protocol that incorporates early rhythm control with a pharmacologic agent and/or synchronized electrical cardioversion (EC) and discharge home from the ED without anticoagulation [2].

1.2. Importance

The burden of AF on the health care system is substantial and is expected to grow [3]. Although the literature is often unclear as to whether symptomatic rapid AF was the proximate cause of the ED visit, it is estimated that 64% of visits to the ED for AF result in admission to the hospital and that 21% of patients presenting have recent onset AF [1,3]. Health care resources and dollars are therefore spent on patients who are otherwise low risk for serious complications, including stroke, who could potentially be discharged from the ED [3]. Other investigators, both in the Unites States and abroad, have safely implemented a rhythm control method, discharging a large percentage of patients presenting to the ED with recent onset AF [4,5]. There has been a trend toward ED observation units managing such patients; however, the emphasis remains on rate control [6]. Protocols emphasizing an ED rhythm control strategy have not been adopted in the United States to date, but with the recent emphasis on cost-efficient management of common problems in cardiology, particularly, the time for examination of such an approach appears propitious.

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1.3. Purpose of this study

The purpose of this prospective trial was to compare an expedited rhythm control strategy in select patients with recent onset AF compared with a recent historical control at our own institution. Our main comparator was admission rates. We also looked at conversion rates, ED length of stay (LOS), and total LOS. Our prospective cohort was also followed up 30 days later and assessed for ED recidivism, adverse events such as stroke, and patient satisfaction. Emergency physicians enrolling patients were also polled on their subjective experience.

2. Materials and methods

2.1. Outline of study design

We conducted a prospective, observational study of consecutive patients with AF (including 1 with atrial flutter) duration less than 48 hours who presented to the ED from May 1, 2013 to April 30, 2014 who met inclusion criteria. We compared this prospective group with historical controls, consecutive patients with recent onset AF who presented to the ED from January to September 2011 and met inclusion criteria for the protocol. This period was chosen specifically because it represented the most pure time before initiation of the protocol. During this specific period, the treatment of recent onset AF was mainly cardiology consultation, admission, and rate control. This timeframe was chosen, as it was just before any rollout or pilot of the rhythm control method. The protocol was developed in collaboration with all 19 cardiologists at our institution in conjunction with the emergency medicine physicians. The rollout took approximately 2 years, including educating all 12 emergency physicians and nurses on study design and specific inclusion criteria. Meetings, e-mails, and posters in the ED accomplished this. The group of ED physicians consisted of all board-certified ED physicians, and each physician enrolled at least 1 patient during the study period; many had never performed ED cardioversion for stable AF before this protocol.

2.2. Development of AF protocol

A specific order set for the protocol was developed in the computer order entry system to ensure standardization and safety. This was also used as a way to track all patients enrolled in the protocol in case a data collection sheet was not filled out. While we began enrolling patients during the pilot period, these patients were not ultimately included in the final study cohort. This pilot period spanned the 2 years before the start of the study. The historical control group was obtained by chart review by the primary and co-investigators. The chart review period was only 9 months because an a priori sample size was calculated at 46 patients, and we obtained 50 within that timeframe. Research ethics board approval was granted by the institutional hospital institutional review board with a decision to waive the need for informed consent, as this was considered one standard of care.

2.3. Study population and demographics

The ED is part of a nonteaching community hospital with an average ED annual census of 60 000. All emergency physicians were board certified, but only 1 had performed cardioversion for stable AF before initiation of this protocol.

2.4. Inclusion and exclusion criteria

If patients met inclusion criteria, the emergency physician rendering care enrolled them in the study. We included consecutive patients presenting to the ED with AF less than 48 hours who did not have any of our specific exclusion criteria. The determination of recent onset AF was left to the provider's discretion; however, if there was any doubt, the patient was excluded. Other exclusion criteria were known ejection fraction (EF) less than 35%, prior coronary artery disease, obvious ischemia on electrocardiogram (ECG), evidence of Wolf Parkinson White syndrome (WPW), unknown duration of symptoms, primary diagnosis not AF, other reason to observe/admit patient, prior cerebrovascular accident (CVA) not on oral anticoagulation, febrile, any antiarrhythmic in the past 72 hours, concurrent QT-prolonging medications (left to discretion of treating provider), known QTc prolongation of 460 milliseconds, and any hospitalizations within the prior 3 months. Prior AF was not an exclusion criterion.

Standard consent for procedural sedation and direct current cardioversion was obtained per hospital protocol. Cardiology consultation was not required, as this protocol was specifically designed to be ED driven. All discharged patients were ensured prompt outpatient cardiology follow-up. The protocol was in keeping with the current at the time American Heart Association (AHA)/American College of Cardiology guidelines from 2010 for the management of AF [7,8].

2.5. Specific study protocol

All enrolled patients were given 1 g of procainamide intravenous over 1 hour as a standard infusion. Nurses were instructed to stop the infusion if the patient developed symptomatic hypotension that did not respond to a 500 mL bolus of normal saline or if the QRS widened more than 50% of baseline. The nurses obtained vital signs every 15 minutes and rhythm strips during the protocol. Once sinus rhythm was restored, the infusion was stopped, and they were discharged home. Patients who did not convert with procainamide alone were observed for 1-hour postinfusion and then offered ED synchronized cardioversion. The ED physician performed the procedural sedation and cardioversion, and propofol sedation was used. Standard postprocedural sedation protocol was followed, and patients were discharged home after successful cardioversion. If the patient did not convert either with procainamide or EC, the ED physician consulted cardiology for further management. No new medications were prescribed.

2.6. Follow-up methods for prospective cohort

A 30-day phone call was made to each enrolled patient in the protocol to assess recurrent AF, adverse events, patient satisfaction, and promptness of outpatient cardiology follow-up. This phone call was made by one of the investigators and followed a standardized data collection form that was created a priori. There were 3 attempts to contact each patient via phone and e-mail. If this was unsuccessful, we then obtained some of the follow-up data from their chart, specifically their cardiology appointment after the ED visit.

In addition, a standardized satisfaction survey was given to the 8 emergency physicians after study completion to assess their experience with adoption of the protocol.

2.7. Data collection for historical cohort

This was compared with a pure historical control group. The rollout of this protocol took close to 2 years with various pilots that were started and stopped, while the protocol was revised. This explains the "pure" historical control group—how the ED was handling recent onset AF before any talk of ED cardioversion and thus was remote from the prospective cohort. The historical controls were consecutive patients abstracted from the charts who presented with recent onset AF (<48 hours) to our ED. If timing of AF was unclear from the records, then patients were excluded from the protocol. Patients were included in the historical cohort if they met all of the study criteria, although the retrospective chart review methods for identifying historical controls could not identify every exclusionary criterion in every case.

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