Brief Report

Initial Experience With Antiarrhythmic Medication Monitoring by Clinical Pharmacists in an Outpatient Setting: A Retrospective Review

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ABSTRACT

Background: Antiarrhythmic medications may be used chronically to prevent recurrences of cardiac arrhythmias. Vaughan Williams class I and class III antiarrhythmic drugs have the potential for serious adverse effects, some of which can result in significant morbidity or mortality. To provide early detection and prevention of adverse events, appropriate therapeutic monitoring has been suggested during amiodarone therapy.

Objective: The objective of this study was to monitor antiarrhythmic drug therapy to improve the continuity and consistency of care for patients receiving class I or class III antiarrhythmic drugs.

Methods: Patients receiving antiarrhythmic medications, including amiodarone, sotalol, dofetilide, and propafenone, were referred to an antiarrhythmic medications clinic (at an academic university), Columbus, Ohio, either at the time of hospital discharge or during an outpatient appointment with a cardiologist, for monitoring. A retrospective chart review was conducted in consecutive outpatients attending the clinic between July 2007 and April 2008. Antiarrhythmic medication monitoring protocols were developed for a pharmacy-based outpatient clinic by a collaborative effort between pharmacists, physicians, and nurses. Adherence to monitoring protocols was assessed, and the type and frequency of pharmacist-identified events and interventions were determined. Continuum of care for patients was facilitated by coordination of referral to specialty clinics (n = 11) or pharmacist contact with physicians (n = 40).

Results: In all, 134 patients were included and were receiving amiodarone (n = 58), sotalol (n = 40), dofetilide (n = 28), or propafenone (n = 8). At enrollment, 59.0% of patients had completed all recommended laboratory and objective testing compared with 98.5% after the initial visit. Adherence to monitoring protocols was improved in patients receiving amiodarone, dofetilide, or propafenone, but not sotalol. Fifty-four patients had a return visit, and after follow-up visits, 100% of patients were current with testing. Pharmacist-identified events or interventions occurred during 38% of visits, including unrecognized adverse event detection (ie, pulmonary function decline, QT prolongation, laboratory abnormality) and clinically significant drug interaction identification. Amiodarone was associated with the highest rate of detected adverse events (23% of patient visits). A change in the antiarrhythmic medication regimen was recommended for 9 patients that later resulted in the discontinuation of therapy in 3 patients.

Conclusion: Pharmacist monitoring of outpatient antiarrhythmic medication therapy appeared to improve patient adherence to recommended testing protocols and to help identify adverse events and clinically significant drug interactions. (*Clin Ther.* 2009;31: 1209–1218) © 2009 Excerpta Medica Inc.

Key words: pharmacotherapy, antiarrhythmic drug, monitoring, adverse effects, drug interactions.

INTRODUCTION

Antiarrhythmic medications may be used chronically to prevent recurrences of cardiac arrhythmias.[1–3]

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Vaughan Williams class I and class III antiarrhythmic drugs are known to have the potential for serious adverse effects, some of which can result in significant morbidity or mortality.[1,3,4] To provide early detection and prevention of adverse events, appropriate therapeutic monitoring during amiodarone therapy has been suggested.[4] Dofetilide therapy is monitored in the United States based on guidelines from the US Food and Drug Administration.[5] While there are recommended monitoring parameters for other antiarrhythmic medications, there are no formal guidelines for monitoring responses to these drugs.

Previous studies that have examined adherence to recommended monitoring guidelines in patients receiving amiodarone have found that with standard care, patient monitoring is often not conducted in compliance with the recommended guidelines.[6–10] To provide consistent monitoring of amiodarone therapy, an approach based on consensus, conducted in a multidisciplinary clinic, has previously been reported to be effective in improving compliance with monitoring guidelines.[10]

In an effort to improve the continuity and consistency of care for patients receiving chronic antiarrhythmic therapy, a therapeutic monitoring program was implemented at the request of 10 electrophysiologists at The Ohio State University Medical Center (OSUMC), Columbus, Ohio.

PATIENTS AND METHODS

Inclusion Criteria

Patients receiving antiarrhythmic medications, including amiodarone, sotalol, dofetilide, and propafenone, were eligible for the study. Patients were referred to an antiarrhythmic medications clinic at the OSUMC Ross Heart Hospital, Ambulatory Care Center either at the time of hospital discharge or during an outpatient appointment with a cardiologist, for monitoring.

Study Design

The present retrospective review included consecutive outpatients enrolled in the Antiarrhythmic Medications Clinic between July 2007 and April 2008. Standardized monitoring protocols for efficacy and adverse events, including clinical thresholds for contacting the supervising electrophysiologist, were developed based on established guidelines for amiodarone[4,11] and dofetilide,[5] while protocols for sotalol and propafenone were developed based on their respective manufacturer recommendations, review of the literature regarding the drugs' adverse effects, and consensus among the electrophysiologists at OSUMC and the pharmacists at the Antiarrhythmic Medications Clinic (**Table I**).

The study period consisted of 2 weekly 4-hour sessions (each 4-hour session was allotted for 8 new patients, 16 returning patients, or a combination of new and returning patients). Frequency of patient visits was set by protocol based on patient medication. On site for each clinic session were a clinical pharmacist (PharmD) who conducted actual assessments, a nurse or medical assistant who helped the clinical pharmacist and conducted vital sign monitoring, and an office associate who handled administrative and clerical tasks.

During the initial visit, patients were assessed by a clinical pharmacist who obtained their medical history and also determined necessary objective testing (eg, laboratory tests, pulmonary function tests [PFTs], electrocardiograms [ECGs], chest x-ray). A supervising electrophysiologist was on-site in the event that a patient required acute cardiac evaluation.

After the initial clinical assessment, an electronic medical chart was created, which included a comprehensive medical history (including comorbidity diagnoses); past and present antiarrhythmic therapies; and baseline and subsequent objective testing results and laboratory values. All testing was performed during the patient visit, with the exception of ophthalmologic examinations, which were recommended for patients receiving amiodarone who had not had an eye exam in the preceding year. PFTs were adjusted for hemoglobin, when available. For patients receiving sotalol, propafenone, or dofetilide, creatinine clearance was estimated using the Cockcroft-Gault method,[12] and for patients >30% over the estimated ideal weight, adjusted weight was used for creatinine clearance estimation.[13,14]

Patient Interview and Education Protocols

At each visit, patients were interviewed by the clinical pharmacist regarding arrhythmia assessment or adverse effects related to the antiarrhythmic medications (**Table II**). A complete medication history, including nonprescription and herbal or nutritional supplements, was obtained. If necessary, the patient's medication list was reconciled (eg, in the event of inappropriate maintenance of a loading dose of amiodarone beyond the scheduled load duration). Based on