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Marwah Dabaja

Tara Jellison PharmD, MBA, FASHP
Parkview Health, tara.jellison@parkview.com

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Evaluating the Effects of Pre-Treatment with Diltiazem Bolus in Acute Atrial Fibrillation

Marwah H. Dabaja, PharmD Candidate; Tara K. Jellison, PharmD, MBA, FASHP
Parkview Regional Medical Center; Fort Wayne, Indiana

OBJECTIVE

- Evaluate the impact of administering a diltiazem bolus for the initial treatment of atrial fibrillation at Parkview Regional Medical Center (PRMC)

BACKGROUND

- Atrial fibrillation is the most common sustained cardiac tachyarrhythmia with a main goal of controlling ventricular rate and rhythm
  - Ventricular rate control in atrial fibrillation is typically achieved by the use of a beta-blocker, non-DHP calcium channel blocker, digoxin, or amiodarone
- Parkview Health most commonly utilizes diltiazem for the treatment of acute atrial fibrillation that requires hospitalization
  - The 2014 treatment guidelines recommend the administration of a bolus dose followed by a continuous infusion when using injectable non-dihydropyridine calcium channel blockers (non-DHP) to treat acute atrial fibrillation
  - Not all patients are receiving a bolus when being treated for actue episodes of atrial fibrillation
  - Not administering a diltiazem bolus may influence patients' success of reaching goals
- Literature looking at the effects of non-DHP calcium channel blocker administration is limited
- This study was designed as a quality improvement project to evaluate patient outcomes

DESIGN & METHODS

Study Design

- Retrospective chart review
- Timeline: August 2018 – July 2019
- Patients who received a diltiazem bolus before the continuous infusion (bolus plus CI) were compared to those who only received a diltiazem continuous infusion (only CI)

Inclusion Criteria

- Coded diagnosis for atrial fibrillation
- Admitted to PRMC or affiliate hospitals
- Received a continuous infusion of diltiazem

Exclusion Criteria

- Patients receiving only a diltiazem bolus
- Did not reach HR < 100 bpm within the first 24 hours after initial administration of diltiazem

DESIGN & METHODS (continued)

Primary Endpoint

- Duration of time to achieve and sustain a heart rate < 100 bpm

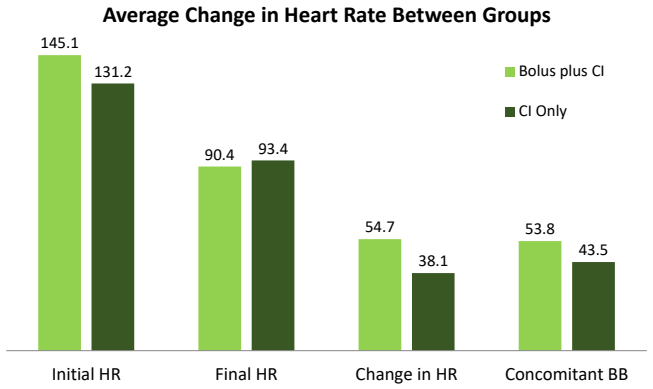
Secondary Endpoints

- Overall change in heart rate
- Duration of time to achieve goal while on concomitant beta-blocker

Baseline Characteristics

Characteristics	CI Only n = 42	Bolus plus CI n = 68
Age, years (mean ± SD)	75.2 ± 14	67.9 ± 16
Male, n (%)	13 (31%)	40 (59%)
Weight, kg (mean ± SD)	81.8 ± 25	93.8 ± 35
Baseline Labs, (mean ± SD)		
Potassium	4.1 ± 0.5	4.1 ± 0.5
Calcium	8.9 ± 0.7	9.2 ± 0.7
Magnesium	1.9 ± 0.3	1.9 ± 0.3
Home Therapy, n (%)		
Beta -Blocker	23 (54.8%)	24 (35.3%)
Non-DHP Calcium channel blocker	10 (23.8%)	9 (13.2%)
Amiodarone	3 (7.1%)	6 (8.8%)
Digoxin	–	2 (2.9%)

RESULTS



RESULTS (continued)

	Bolus plus CI	CI only	P-Value
Mean duration of time to achieve HR goal	230 minutes	285 minutes	p = 0.367
Mean drop in HR	55 bpm	38 bpm	**p < 0.001**
Mean duration of time to achieve HR goal with concomitant BB	278 minutes	319 minutes	–
Mean drop in HR with Concomitant BB	54 bpm	44 bpm	–

DISCUSSION & CONCLUSIONS

- The pre-treatment with a diltiazem bolus in the management of acute atrial fibrillation exacerbations has not shown to have an impact on how quickly patients reach goal heart rate
- However, it did prove to be beneficial in dropping patients' heart rates considerably lower than without pre-treatment

Limitations

- Retrospective, chart review nature
- Small sample size
- Did not evaluate the dose patients were receiving to correlate to their outcomes

Implications of Results

- Further studies are warranted to evaluate the impact of these findings on clinical outcomes including adverse effects, hospital length of stay, and readmission rates.

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DISCLOSURE

Neither author has any conflicts of interests to disclose. This project was approved by the Parkview Health Institutional Review Board

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