



Pharmacists Enhancing the Time to Cardiac Catheterization Laboratory and Patient Safety during Acute Myocardial Infarction Presentation to the Emergency Department

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The authors have nothing to disclose.

Introduction

- Pharmacists as members of multi-disciplinary patient care teams have been shown to reduce the number of adverse drug events
- Emergency Pharmacist (EPH) services were implemented in 2000 to enhance patient safety in the Emergency Department (ED)
- Our institution is a regional cardiac catheterization center that services over 100 acute myocardial infarctions (AMI) patients undergoing primary percutaneous coronary intervention per year
- Based on ACC/AHA guidelines for the management of patients presenting with ST-segment elevation myocardial infarction (STEMI), door-to-balloon time of 90 minutes or less is recommended
- Complex medication regimen requirements for the management of AMI may contribute to delays in patient transfer to the cardiac catheterization laboratory (CCL)
- It is hypothesized that the EPH, as a member of the AMI team, will improve patient management

Description of the Program

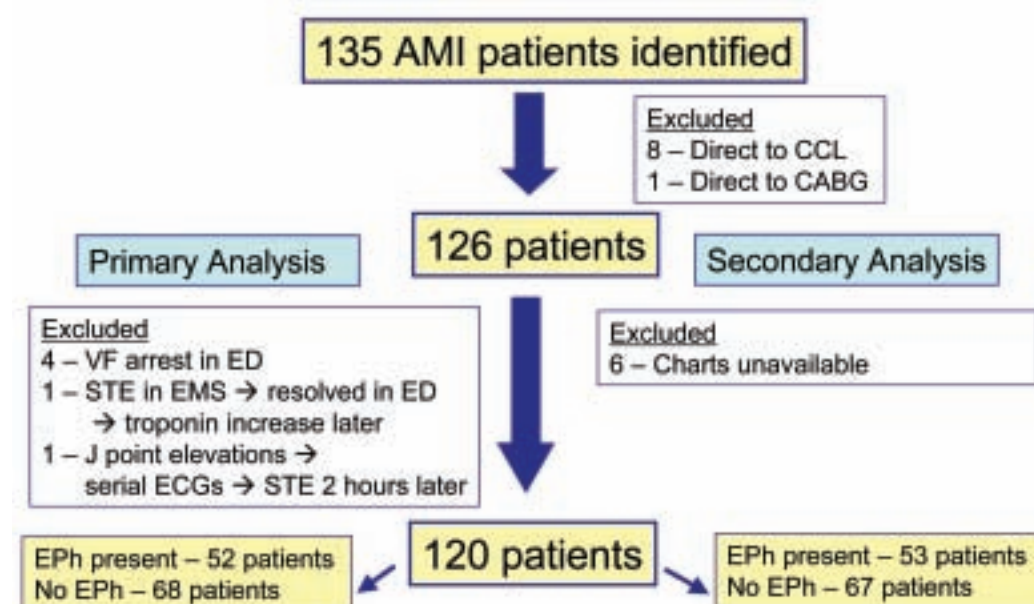
Goals of the EPH as a member of the AMI team

- Facilitate timely medication preparation and administration
- Reduce medication errors through prospective screening and intervention
- Assure safe and appropriate medication therapy for patients

Specific duties of the EPH during AMI patient presentation

- Gather patient specific information
- Evaluate appropriate medications and medication doses
- Facilitate medication administration by
 - Obtaining medication from the automated dispensing cabinet and/or central pharmacy
 - Programming medication infusion pumps
- Prevent adverse drug events and potential adverse drug events (ADE/PADEs)

Results



- CCL staff presence versus on-call staff and arrival to the ED by emergency medical services versus self were identified as potential confounders

Experience with the Program

Objectives

- Primary – determine the effect of EPH presence on door-to-CCL time and door-to-balloon time
- Secondary – determine the effect of EPH presence on the incidence of ADE/PADEs, medication errors, and problem drug orders

Methods

- Chart review and analysis of an existing database
 - Patients who presented to the ED from August 15, 2005-06
 - AMI team was called for patient evaluation
 - Subsequent urgent cardiac catheterization was necessary
- Data collection included
 - Baseline demographics
 - Detailed medication administration history
 - Timing of arrival to the ED, diagnostic electrocardiogram (ECG), arrival to the CCL, balloon angioplasty
- Patients were separated into two groups following blinded data collection
 - EPH present
 - EPH not present
- Door/ECG time was developed to accurately capture the time the EPH would be involved in care
 - For patients in whom the STEMI was identified prior to presentation to the ED, the adjusted door/ECG time was the time that the patient entered the ED
 - For patients in whom the STEMI was identified in the ED, the adjusted door/ECG time was the time of diagnostic ECG
- Groups were compared utilizing both univariate and multivariate analyses to detect differences in the door-to-balloon, adjusted door/ECG-to-balloon, and adjusted door/ECG-to-CCL times
- Chi-square analysis was used to detect differences in secondary outcomes

Results (continued)

EPH presence was independently associated with:			
	Time Difference (min)	95% Confidence Interval	p-value
Door-to-Balloon Time	14.4	1.7, 27.1	0.03
Adjusted Door/ECG-to-Balloon Time	11.2	1.3, 21.2	0.03
Adjusted Door/ECG-to-CCL Time	11.4	3.3, 19.5	0.006

*General Estimating Equation (GENMOD Procedure)

EPH presence was independently associated with:			
	Odds Ratio	95% Confidence Interval	p-value
Adjusted Door/ECG-to-Balloon Time ≤ 90 minutes	3.8	1.2, 11.9	0.02
Adjusted Door/ECG-to-CCL Time ≤ 30 minutes	3.1	1.3, 7.8	0.01
Adjusted Door/ECG-to-CCL Time ≤ 45 minutes	2.9	1.0, 8.5	0.05

*Multivariate Logistic Regression Model (LOGISTIC Procedure)

- Secondary analysis determined that the presence of the EPH was associated with a decrease in all medication related events (ADE/PADEs, medication errors, and problem drug orders), p=0.002

Conclusion

- The EPH as a member of the AMI team
 - Decreased door-to-balloon, adjusted door/ECG-to-balloon, and adjusted door/ECG-to-CCL times
 - Decreased ADE/PADEs, medication errors, and problem drug orders
- Based on the success of this program, we would like to expand our program to incorporate the in-patient pharmacy providers into the AMI alert response team in the ED when an EPH is not present so that we will be able to provide 24-hour pharmacy services to all AMI patients

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