

Mode of Transport Does Not Affect Door-to-Balloon Time in STEMI in Southwest Oklahoma

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Objectives

- Examine the effect of mode of transport on door-to-balloon time in STEMI patients transferred to the regional PCI facility in Southwest Oklahoma
- Compare transport times of air versus ground EMS transport in patients with time-sensitive medical condition

Background

In Southwest Oklahoma, ST-segment myocardial infarction (STEMI) patients often present to facilities that do not have the capability of performing percutaneous coronary intervention (PCI). In these scenarios, patients require transfer to PCI-capable hospitals for definitive care. The American Heart Association (AHA) currently recommends that PCI be achieved within 120 minutes of arrival at the initial, non-PCI facility, therefore requiring emergent and rapid transfer for definitive care.

Helicopter emergency medical services (HEMS) is often utilized when the transport distance is greater than 30 miles, however, it is uncertain if it is any better than ground transport in reducing time to PCI. The southwest Oklahoma region's STEMI network utilizes Comanche County Memorial Hospital (CCMH) as the primary receiving PCI facility. Other facilities in the region are located between 5 and 70 miles from CCMH, therefore close facilities never utilize air transport while distant facilities solely use air transport. Each facility makes an independent decision on whether to utilize ground or air transport, and not all facilities used both transport methods.

This study is focused on the comparison of two facilities that utilized both air and ground EMS transport of STEMI patients that were being transferred to CCMH for definitive care (PCI). Facility A is located 34 miles from CCMH and facility B is located at a distance of 54 miles.

The purpose of this study was to evaluate if HEMS transport to the regional PCI hospital in southwest Oklahoma is superior to ground transport in achieving PCI within 120 minutes.

Methods

The project was approved by the Institutional Review Board prior to data collection and analysis. The STEMI registry was reviewed to gather data on patients transferred to Comanche County Memorial Hospital between January 2015 and June 2016 with a diagnosis of STEMI. Of all STEMI patients transferred to CCMH during that time, there were 39 patients that were transferred from facilities that used both air and ground transport. Two data sets were incomplete, and therefore excluded from data analysis. Other exclusion criteria included unstable patients that could not undergo PCI. Retrospective data was analyzed in compliance with HIPAA as well as institutional policies.

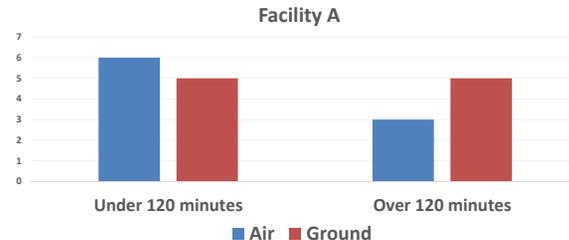
Study inclusion criteria included patients age 18 years or older, diagnosis of STEMI, and transfer from a non-PCI facility to CCMH. There were 37 complete data sets analyzed. The initial time triaged at the non-PCI facility was considered "door" time and was recorded by the STEMI coordinator in the registry. The time of PCI was considered the "balloon" time and was recorded in the STEMI registry.

The primary outcome measure in this study was how the mode of transport affects the AHA goal of door-to-balloon time within 120 minutes. Of the 37 patients, 65.4% transferred by ground EMS achieved PCI within 120 minutes, while only 54.5% of patients transferred by HEMS achieved the goal ($p=0.53$).

Results



Overall analysis of patients transferred to CCMH from either of two facilities in southwest Oklahoma met the AHA goal in 65.4% (17/26) of cases transferred by ground EMS, and 54.5% (6/11) of cases transferred by HEMS. Data were analyzed using chi-square, $p=0.53$, leading to results that are not statistically significant at $p<0.05$.



Individual facility data were also analyzed. Facility A, located 34 miles from CCMH, achieved AHA goal with ground EMS transfers 50% (5/10) of the time, and met goal 66.7% (6/9) of the time when using HEMS. These results are not statistically significant, $p=0.46$.



Facility B, located 54 miles from CCMH, achieved transfer to PCI within 120 minutes 75% (12/16) of the time when using ground EMS. However, 0% (0/2) of HEMS transfers met the AHA goal. These results are statistically significant, $p=0.03$.

Conclusion

Ground transport of STEMI patients to the regional PCI hospital in southwest Oklahoma was as effective as HEMS in achieving PCI within 120 minutes as is recommended by the American Heart Association. This study suggests that HEMS transport does not greatly improve door-to-balloon time when compared with ground EMS. In this study, a greater proportion of patients transferred by ground EMS achieved PCI within 120 minutes, however this was not statistically significant. Helicopter and ground ambulance availability, weather conditions, personnel requirements, and provider preference/experience must all be considered by the transferring provider. The transferring provider should use a first-available, most-appropriate transport method for STEMI patients when they require transfer to definitive care.

Limitations

- Helipad located 0.5 miles from hospital campus
- Only two facilities in the regional STEMI network utilized both air and ground EMS transport methods
- More patient transfers were performed using ground EMS
- This study did not scrutinize the specific time intervals and events that can affect total time to PCI

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Use of Short Term Topical Tetracaine for Corneal Abrasions

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INTRODUCTION

Acute corneal abrasions are a frequent complaint in the emergency department. Current emergency department management of acute corneal abrasions generally discourages prescribing topical ophthalmic anesthetics due to theories of delayed epithelial healing. Previous studies have shown promise that short-term topical anesthetics are safe but additional research is necessary to change current practice.

OBJECTIVES

This study intends to evaluate if patients can be safely discharged home with topical 0.5% tetracaine for simple corneal abrasions for improved pain control versus placebo eye drops, without the increased risk of delayed corneal healing.

As a secondary outcome, this study is interested in showing a reduction of narcotic pain medication.

METHODS

This study was a prospective, double-blind randomized controlled trial conducted in an urban community emergency department with affiliated emergency medicine residency.

Study Group

- Tetracaine 0.5% - one drop q30 mins prn
- Polymyxin B/trimethoprim ophthalmic
- Hydrocodone/APAP 7.5/325mg – 12 tablets

Placebo Group

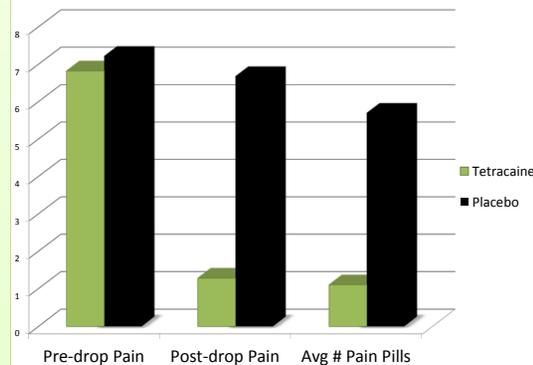
- Systane artificial tear solution
- Polymyxin B/trimethoprim ophthalmic
- Hydrocodone/APAP 7.5/325mg – 12 tablets

Both Groups

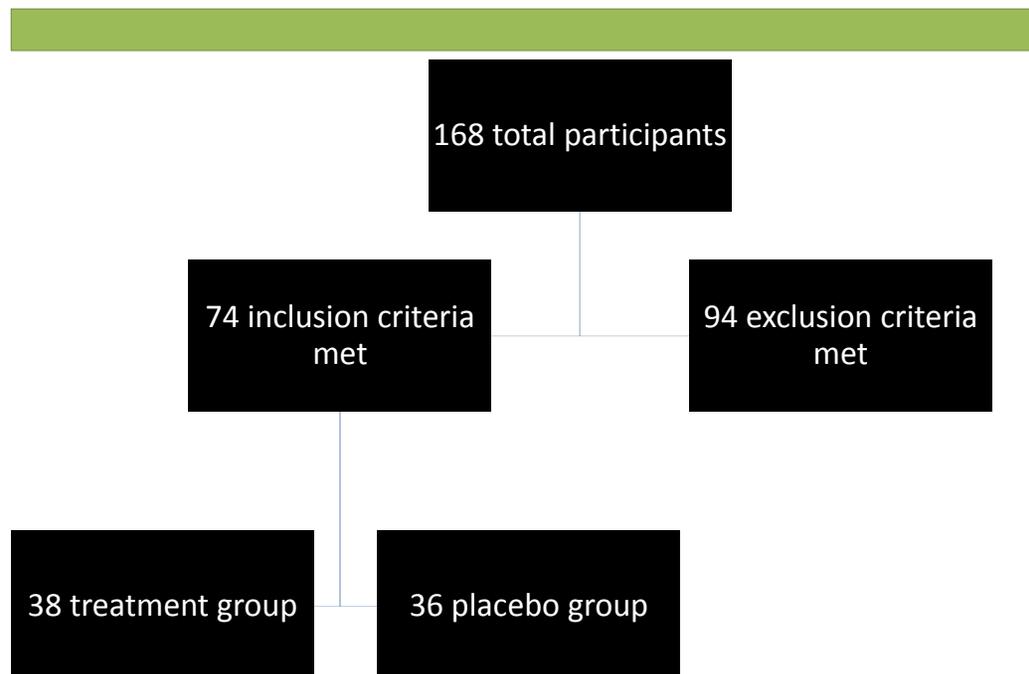
- Instructed to use one drop of study medicine in affected eye every 30 minutes as needed for 24 hours and record pre and post pain scores

RESULTS

Mean Pain Score



Inclusion Criteria	Exclusion Criteria
1) Age 18-80 years old	1) Penetrating Eye Injury
2) Corneal Abrasion	2) Previous Corneal Surgery
3) Obtained Informed Consent	3) Pregnancy
	4) Contact Lens Use
	5) Retained Foreign Body
	6) Immunosuppression
	7) Allergy to Study Medication
	8) Injury > 36 hours old



DISCUSSION

There is limited research on topical anesthetic use in the treatment of pain associated with acute corneal injuries in the emergency department. The initial data written about corneal abrasions involved case studies of human subjects with unsupervised, prolonged anesthetic use, many with concomitant steroid use. More recent literature has shown no ocular complications or signs of delayed wound healing. This study found significant reduction in pain scores and hydrocodone use without evidence for complications.

CONCLUSION

Topical tetracaine, when used for uncomplicated corneal abrasions less than 36 hours old significantly decrease pain scores and may be safe for short-term use. A secondary outcome suggests this may also decrease the use of hydrocodone/APAP.

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Initiating a Community-Based Blood Pressure Monitoring Program in Community Health Patients



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Background

Heart disease is the number one killer of Oklahomans, accounting for 1 in 4 deaths. Hypertension is one of the leading risk factors for stroke and heart attack. Heartland OK is a community-based BP monitoring program available through the local health departments across Oklahoma that was initiated by the state to aid in reducing morbidity and mortality due to hypertension. This program provides BP monitoring, diet and disease process education, and counseling on medication compliance through biweekly appointments with an RN.

Purpose

In 2014, Lawton Community Health Center (LCHC) performed below the state and national average for blood pressure control. Based on this data, the researchers partnered with Comanche County Health Department to utilize Heartland OK to improve blood pressure control in our patient population, thereby reducing the morbidity and mortality of the community and state.

Methods

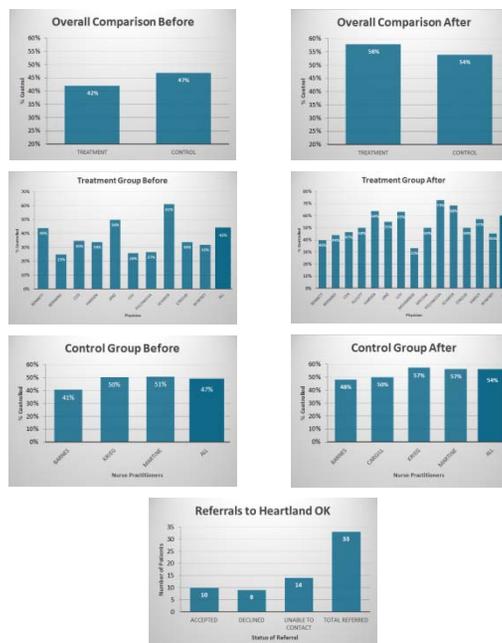
Hypertensive adult patients at the LCHC who are not pregnant or on dialysis were included. Patients of the Residency Clinic at LCHC comprised the treatment group while the control group was comprised of the Nurse Practitioner Clinic at LCHC. Blood pressure control between the treatment and control groups was calculated using the HEDIS Dashboard associated with eClinical Works EHR based on a 12 month period prior to implementing the project. Patients in the treatment group with uncontrolled HTN were referred to Heartland OK. BP control was then compared between the groups after 7 months of the program. The health department provided weekly reports to the researchers regarding program participation. This data was reviewed to analyze the number of patients that were enrolled in the program, that declined the program and that were unable to be contacted by the health department.

Hypothesis

Initiating a community-based blood pressure monitoring program will improve the percentage of adult patients with adequate BP control (<140/90) at LCHC.

Results

The improvement in BP control in the treatment group was 15.7% whereas the improvement in the control group was 7%.



Confounding Factors

The data analyzing software was unable to control for comorbidities or exclude new diagnoses of HTN. Four providers in the treatment group and one in the control group were not included in the "before" data as they were not yet employed at the clinic. Medical experience has increased as the residents have progressed, likely improving BP control.

Conclusions

After initiating a policy of referring uncontrolled hypertensives to Heartland OK, the percentage of patients meeting BP control (<140/90) in the treatment group increased over the project duration, and had greater improvement than the control group, supporting our hypothesis. We also saw our percentage of control increase to above the national average. Support for the hypothesis was weakened by the length of follow-up time being too short to evaluate for sustained changes and by confounding factors.

Recommendations

Continue referring to Heartland OK. As data continues to be collected through ongoing follow-up, analyze the percent change in control and the absolute change in BP between those who accepted and declined the program. Develop ways the physician and staff can foster compliance with the monitoring program, potentially through novel methods. Develop methods of data collection and analysis that better control for comorbidities, include appropriately different blood pressure goals for different age groups, and other confounding factors. Continue to focus on ways to improve blood pressure control in our community.

References

8th Joint National Committee Guidelines; 2014 State of the State's Health, Oklahoma State Department of Health; Heartland OK at Comanche County Health Department; American Heart Association Guidelines

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