

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: Treating STEMI in the pre-hospital setting with a thrombolytic vs fibrinolytic drug

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Clinical Scenario:

A 56 year old male develops chest pain while at work. Patient explains it to be a heavy feeling in the center of the chest and it radiates down the arm. The patient is feeling nauseous and short of breath. Paramedics do a 12-lead and the ECG reveals a STEMI. Would the administration of a thrombolytic vs fibrinolytic drug decrease mortality?

PICO (Population-Intervention-Comparison-Outcome) Question:

In management of prehospital ST-elevation myocardial infarction patients, would the administration/addition of a thrombolytic vs fibrinolytic drug to prehospital standards, compared to standard cardiac ischemia standards reduce overall patient mortality?

Search Strategy:

See Appendix 1 and 2 for search results and search strategy.

Search Outcome:

The search for thrombolytic drugs yielded 45 papers. 1 paper was considered relevant to this PICO question (See Appendix 1). The search for fibrinolytic drugs yielded 38 results. 1 paper was considered relevant to this PICO question (See Appendix 2)

Relevant Papers: There were 2 relevant papers to the CAT

AUTHOR, DATE	Population: SAMPLE CHARACTERISTICS	DESIGN	OUTCOMES	RESULTS	STRENGTHS/WEAKNESSES
Solhpour, Chang, Balan, Cai, Sdringola, Denktas, Smalling and Anderson Oct 2014	Prehospital administration of reduced-dose fibrinolytic agents coupled with urgent percutaneous coronary intervention (FAST-PCI) in patients 75 years or older presenting with ST-segment elevation myocardial infarctions (STEMI). Data from 120 patients treated with the FAST-PCI strategy and 94 were just treated with PCI strategy at the hospital. This was determined by if the paramedics were equipped with the fibrinolytic agent or not.	The study was a retrospective cohort study.	Mortality rate at 30 days. Stroke, reinfarction, and major bleeding were also compared.	At 30 days, mortality was lower with the patients that were delivered the fibrinolytic than just PCI. (4.2 % vs 18%, p<0.01). Rates of stroke, reinfarction, and major bleeding were similar in the two groups (4% vs 2%). The patients who received the fibrinolytic agent had lower rates of cardiogenic shock on hospital arrival (15% vs 26%, p=0.05) and completely occluded infarct arteries (35% vs 61%, p<0.01). In conclusion, patients 75 and older who received the agent were associated with reduced 30-day mortality, earlier infarct artery patency, and lower incidence of cardiogenic shock at arrival compared with just PCI, without bleeding, stroke, or reinfarction penalties.	<u>Strengths:</u> Compare d baseline characteristics and hospital course of all patients Considered multiple outcomes other than just mortality. <u>Weaknesses:</u> Small sample size. Selection bias with age. Not all crews were equipped with fibrinolytic agents.
McCaul, Lourens, And Kredon Sept 2014	It is a randomised controlled trial of pre-hospital versus in-hospital thrombolysis in adults with ST-elevation myocardial infarction diagnosed by a healthcare	Randomised Controlled Trial.	All-cause hospital mortality. Patients were followed from 15 days – 1 month.	The study found there to be low quality evidence indicating uncertainty whether pre-hospital thrombolysis reduces all-cause mortality in individuals with STEMI compared to in-hospital thrombolysis. (Risk ratio 0.73, 95% confidence	<u>Strengths:</u> Randomized control trail. <u>Weaknesses:</u> Low sample size.

	provider. There were three trails done involving 538 participants.			interval 0.37 to 1.41). There was high evidence that pre-hospital thrombolysis reduced the time to receipt of thrombolytic treatment compared with in-hospital thrombolysis. There was moderate-quality evidence that bleeding events was similar between participants receiving in-hospital or pre-hospital thrombolysis.	States that the included studies had an overall unclear/high risk of bias. Only followed patients for 30 days.
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Comments:

The research shows that fibrinolytic drugs can reduce the mortality when administered in the pre-hospital setting, while thrombolytic has no clear evidence. This is something that should have further research done on it to look at the longer-term impacts on patients, and to gain a better sample size to prove that this should be implemented in the field. Thrombolytic drugs have low evidence shown that it can help reduce mortality. If this were to continue to get researched, this could greatly benefit patients and reduce mortality when it comes to patients suffering from heart attacks.

Clinical Bottom Line:

The research have shown that using thrombolytic vs fibrinolytic drugs in the pre-hospital setting could help reduce mortality rates if it is used in the pre-hospital environment. This clinical finding should help make paramedic services look into implementing a pre-hospital thrombolytic or a fibrinolytic standard for STEMI patients after further research is done. Further research would help specify the positives and risks of the drugs in the pre-hospital environment.

References:

Mccaul,M., Lourens, A., & Kredo,T. (2014). Pre-hospital versus in-hospital thrombolysis for St-elevation myocardial infarction. *Cochrane Database of Systematic Reviews*. Doi: 10.1002/14651858.pub2

Solphour,A., Chang, K., Balan, P., Cai, C., Sdringola, S., Denktas, A. E, Anderson, H.V. (2014) Comparison of Outcomes for Patients 75 Years of Age Treated With Pre-Hospital Reduced-Dose Fibrinolysis Followed by Percutaneous Coronary Intervention Versus Percutaneous Coronary Intervention Alone for Treatment of ST-Elevation Myocardial Infarction. *The American Journal of Cardiology*, 113(1), 60-63. Doi: 10.1016/j.amjcard.2013.09.017

Appendix 1: (Thrombolytics)


 Searching: MEDLINE, CINAHL Show Less | Choose Databases
 All Resources eBooks Books Journal Articles
 S19 AND S20 AND S21 AND S22


[Basic Search](#) [Advanced Search](#) [Search History](#)

Search History/Alerts

[Print Search History](#) [Retrieve Searches](#) [Retrieve Alerts](#) [Save Searches / Alerts](#)

<input type="checkbox"/> Select / deselect all <input type="button" value="Search with AND"/> <input type="button" value="Search with OR"/> <input type="button" value="Delete Searches"/> <input type="button" value="Refresh Search Results"/>			
Search ID#	Search Terms	Search Options	Actions
<input type="checkbox"/> S23	S19 AND S20 AND S21 AND S22	Limiters - Published Date: 20120101-20170331; English Language Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (45)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S22	S15 OR S16 OR S17 OR S18	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (59,810)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S21	S11 OR S12 OR S13 OR S14	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (252,537)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S20	S7 OR S8 OR S9 OR S10	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (128,737)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S19	S1 OR S2 OR S3 OR S4 OR S5 OR S6	Expanders - Apply related words	<input type="button" value="View Results (253,771)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S18	thrombolytic agents	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (13,337)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S17	thrombolytic therapy	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (57,123)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S16	thrombolytics	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (6,394)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S15	thrombolytic therapy for acute myocardial infarction	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (7,538)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S14	st elevation myocardial infarction	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (21,095)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S13	myocardial infarction	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (249,999)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S12	heart attack	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (248,132)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S11	stemi	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (8,689)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S10	emt	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (14,570)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S9	emergency medical services	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (98,426)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S8	ems	Expanders - Apply related words	<input type="button" value="View Results (24,145)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S7	paramedic	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (6,736)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S6	out of hospital care	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (57,862)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S5	out of hospital	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (231,686)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S4	prehospital	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (21,316)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S3	prehospital emergency care	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (12,004)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S2	prehospital care	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (16,397)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>
<input type="checkbox"/> S1	pre-hospital	Expanders - Apply related words Search modes - Find all my search terms	<input type="button" value="View Results (4,109)"/> <input type="button" value="View Details"/> <input type="button" value="Edit"/>

Appendix 2: (Fibrinolytics)

#	Query	Limiters/Expanders	Last Run Via	Results
S23	S18 AND S19 AND S20 AND S21 AND S22	Limiters - English Language Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	38
S22	S15 OR S16 OR S17	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	36,985
S21	S11 OR S12 OR S13 OR S14	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	252,537
S20	S7 OR S8 OR S9 OR S10	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	128,737
S19	S1 OR S2 OR S3 OR S4 OR S5 OR S6	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	253,771
S18	mortality rate	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	394,443
S17	fibrinolytic agents	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	32,505
S16	fibrinolytic therapy	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	29,110
S15	fibrinolytics	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	4,932
S14	st elevation myocardial infarction	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	21,095
S13	myocardial infarction	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	249,999
S12	heart attack	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	248,132
S11	STEMI	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search	8,689
S10	emt	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	14,570
S9	emergency medical services	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	98,426
S8	ems	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	24,145
S7	paramedic	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	6,736
S6	out of hospital care	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	57,862
S5	out of hospital	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	231,686
S4	prehospital	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	21,316
S3	prehospital emergency care	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	12,004
S2	prehospital care	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	16,397
S1	pre-hospital	Expanders - Apply related words Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE,CINAHL	4,109