

Paramedic - Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: Pre-Hospital use of therapeutic beta-blocker in ACS patients

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Clinical Scenario: You're on scene with a patient experiencing chest pain and showing all the signs of an MI. After a thorough assessment you determine they are eligible for PCI but you do have a bit of a distance to travel. Would it not be nice to have additional tools available to help lower the patient's heart rate and lessen the potential damage to their heart.

PICO (Population – Intervention – Comparison – Outcome) Question

Population – ACS patients

Intervention – Prehospital use of beta blockers

Comparison –

Outcome – Improved mortality

Search Strategy:

((("acute coronary syndrome"or"ACS patients"or"prehospital"or"out of hospital"or"paramedic"or"emergency medical *"or"EMS") AND "beta blockers"or"beta adernergic"or "class II anti arrhythmic"))

Search Outcome:

10,723 results



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Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Park, K.L., ETAL 2014	13,110 adults (> 18 years suffering from ACS registered in the Global Registry of Acute Coronary Events	This was a level II retrospective study of people treated for ACS with STEMI in 126 hospitals globally.	The use of early beta blockers associated with a decreased risk of cardiogenic shock, ventricular arrhythmias and acute heart failure.	4.8% cardiogenic shock in early (<24 hrs) IV beta blocker (p value < .001) vs 3.0% cardiogenic shock in early (<24 hrs) oral beta blockers (p value < .001) vs 6.2% cardiogenic shock vs delayed (>24hrs) beta blockers (p value .038) 15% Heart Failure in early IV beta blockers (p value .15) vs 14% heart failure in early oral beta blockers (p value <.001) vs 19% heart failure in delayed beta blockers (p value < .001) 11% VF/VT in early IV beta blockers (p value <.001) vs 6.7% VF/VT in early oral beta blockers (p value <.001) vs 9.5% VF/VT in delayed beta blockers (p value .27)	There were some flaws involved. It was a large retrospective study involving 126 hospitals. The population was not randomized, and protocols may have varied with each hospital. Other medications might have compounded the situations and not one specific beta blocker was used.
Borja, I., ETAL 2013	270 patients experiencing > 2mm elevation in lead V1-V5	This was a single blind (to evaluators only) randomized study with 2 groups. 1 receiving IV metoprolol prior to	The early use of IV metoprolol in conjunction with PCI treatment reduces the infarct size and adverse affects	Group 1 IV metoprolol (n=140) Major acute cardiac event >24hrs 7.1% vs Control (n=130) Major acute cardiac event 12.3%	This study was randomized and single blind study. The acceptance criteria were narrow. The specific requirements



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		PCI and 1 not receiving IV metoprolol		Group 1 Death 0% vs Control 0.8% Group 1 Malignant VF/VT 3.6% vs control 7.7% Group 1 Advanced AV Block 0.7% vs control 1.5% Group 1 cardiogenic shock 4.3% vs Control 0%	of precordial lead elevation gave precision. Also that one medication was administered added to the strength.
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Comments: With the retrospective study done with the GRACE, the authors did note that there was an increased in-hospital death rate that coincided with early administration of early IV beta blockers, but it is hard to tell how acutely ill the patients at that time were (early IV at 4.9% vs early oral at 3.8% vs delayed beta blockers at 2.9%).

Consider: I believe a little more evidence is required before changing paramedic practice. I would like to see a North American trial done with a blind component to it. The study done in Spain does so promise that IV metoprolol could prove beneficial when given early.

Clinical Bottom Line: There is some evidence that pre-hospital IV beta blockers can improve patient outcome when in conjunction with PCI

References: Park, K.L. & ETAL, 2014, American Journal of Medicine, Vol 127, pg 505 – 511
 Borja, I. MD & ETAL, 2013, Centro Nacional de Investigaciones Cardiovasculares, Oct 1 2013, pg 1495-1505

