

Paramedic - Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: *IV Beta-Blocker use in STEMI*

Report By: Adam Melbourne

2nd Party Appraiser: *Jen Greene*

Clinical Scenario:

Paramedics are dispatched to a Pt. complaining of chest pain. After a full assessment and 12 lead EKG they confirm that the Pt is having a STEMI. They are able to transport the Pt. to a hospital that is able to perform PCI in less than 60mins.

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

In prehospital STEMI pts does the use of Beta-blockers reduce mortality?

Search Strategy:

(Prehospital OR "out-of-hospital" OR ambulance OR paramedic OR EMS OR EMT) AND ("Beta-Blocker" OR "beta blocker" OR Metoprolol OR Labetalol) AND ("STEMI" OR "MI" OR "AMI" OR "ST-Elevation MI" OR Myocardial Infarction" OR "Inferior MI" OR "Acute MI"

Search Outcome:

I'm sorry to say that I was unable to recreate the search because I forgot to save my search



Paramedic - Evidence Based Medicine (P-EBP) Program

Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Sterling, L. 2016	1149 adults having STEMI receiving PCI	Meta-analysis, retrospective of 4 different RCT's LOE 1	The role of IV Beta-blockers in conjunction with PCI for STEMI	Improved LVEF with IV Metoprolol 0-2wks(95% CI: -0.7%, 4.5%), 4-6wks(95% CI: -3.1%, 5.9%) post-infarct, at 24wks(95% CI: .0.6%, 4.6%) Ventricular arrhythmia(95% CI: 0.33, 1.29), any arrhythmia(95% CI: 0.36, 1.27), cardiogenic shock(95% CI: 0.31, 1.95)	Big sample size, good use of 4 RCT, but needs to be carried on longer to see the long term effects.
Pizarro, G. 2014	202 adult Pt's (101 per group) having an STEMI receiving PCI	The METOCARD-CNIC (Effect of Metoprolol in Cardioprotection During an Acute Myocardial Infarction) trial, RCT LOE 1	The long-term benefit of IV Metoprolol of early pre-reperfusion in AMI	MRI showing At 6mts Higher LVEF 48.7% with IV Metoprolol vs. 45% Control (CI-95%, p=0.025) Depressed LVEF ($\leq 35\%$) lower in pt's treated with metoprolol vs. control (11% vs. 27%, p=0.006) ICD lower with IV Metoprolol than control (7% vs. 20%, p=0.012) 2yr follow-up of death, heart failure, reinfarction, malignant arrhythmias lower in IV metoprolol vs. control (10.8 vs. 18.3%, 95%CI, p=0.065) heart	Small sample size, good RCT, with results for 2yrs.



Paramedic - Evidence Based Medicine (P-EBP) Program

				failure admission lower with iv metoprolol vs. control(95% CI, p=0.046)	
Ibanez, B. 2013	RCT of 270 Pt's having an STEMI with 220 Pt.(106Pt. IV metoprolol, 114 Pt. control) being followed up.	Effect of Early Metoprolol on Infarct Size in ST-Segment-Elevation Myocardial Infarction Patients Undergoing Primary Percutaneous Coronary Intervention (METOCARD-CNIC) Trial LOE 1	Effect of Early Metoprolol on Infarct Size in ST-Segment-Elevation Myocardial Infarction Patients Undergoing Primary Percutaneous Coronary Intervention	Using MRI Infarct size smaller with IV Metoprolol vs. control (25.6±15.3g vs. 32 ±22.2g, 95% CI: -11.39 to -1.78, p=0.012) Pre-PCI thrombolysis in MI grade 0-1 flow adjusted treatment difference in infarct size -8.13(95% CI: -13.10 to -3.16, p=0.0024) LVEF higher in IV Metoprolol (95% CI: 0.09-5.21, p=0.045) Death, malignant ventricular arrhythmia, cardiogenic shock, AV block and reinfarction at 24hrs, IV metoprolol vs. control (7.1% vs. 12.3%, p=0.21)	Small sample size, only studied for the 24hrs after administration and PCI, but showed positive results.

Comments:

All 3 studies followed very similar methods and inclusion criteria like: Killip class II or less, STEMI within 6-12hrs of symptoms, undergoing PCI. They all used and MRI to monitor pt. results (LVEF and infarct size). They didn't specify the dose of metoprolol administered.

Consider:



Paramedic - Evidence Based Medicine (P-EBP) Program

Unsure of the long-term effects, further study would need to be done before practice can change.

Clinical Bottom Line:

Although all the studies showed positive results with the use on IV metoprolol with PCI, further study and follow-up of the pt's would be needed. The longest study was 2 years.

References:

Gonzalo Pizarro, MD,*y Leticia Fernández-Friera, MD, PHD,*z Valentin Fuster, MD, PHD,*x Rodrigo Fernández-Jiménez, MD,*k José M. García-Ruiz, MD,*{ Ana García-Álvarez, MD, PHD,*# Alonso Mateos, MD,** María V. Barreiro, MD,yy Noemí Escalera, BPT,* Maite D. Rodriguez, RN,* Antonio de Miguel, MD,zz Inés García-Lunar, MD,*yxx Juan J. Parra-Fuertes, MD,kk Javier Sánchez-González, PHD,*{{ Luis Pardillos, MD,** Beatriz Nieto, MD,zz Adriana Jiménez, MD,## Raquel Abejón, RN,** Teresa Bastante, MD,*** Vicente Martínez de Vega, MD,y José A. Cabrera, MD, PHD,y Beatriz López-Melgar, MD,*kk Gabriela Guzman, MD, PHD,*yyy Jaime García-Prieto, BSC,* Jesús G. Mirelis, MD, PHD,*xx José Luis Zamorano, MD, PHD,k Agustín Albarrán, MD, PHD,kk Javier Goicolea, MD, PHD,xx Javier Escaned, MD, PHD,*k Stuart Pocock, PHD,*zzz Andrés Iñiguez, MD, PHD,zz Antonio Fernández-Ortiz, MD, PHD,*k Vicente Sánchez-Brunete, MD,** Carlos Macaya, MD, PHD,k Borja Ibanez, MD, PHD*k Madrid, Oviedo, Barcelona, Galicia, Pontevedra, and León, Spain; New York, New York; and London, United Kingdom 2014

Lee H. Sterling a,b , Kristian B. Fillion a,b,c,1 , Renee Atallah a , Pauline Reynier a , Mark J. Eisenberg a,b,c,d, □ a Division of Clinical Epidemiology, Lady Davis Institute, Jewish General Hospital/McGill University, Montreal, QC, Canada b Faculty of Medicine, McGill University, Montreal, QC, Canada c Department of Epidemiology, Biostatistics and Occupational Health, McGill University, Montreal, QC, Canada d Division of Cardiology, Jewish General Hospital/McGill University, Montreal, QC, Canada 2016



Paramedic - Evidence Based Medicine (P-EBP) Program

Borja Ibanez, MD, PhD; Carlos Macaya, MD, PhD; Vicente Sánchez-Brunete, MD; Gonzalo Pizarro, MD; Leticia Fernández-Friera, MD, PhD; Alonso Mateos, MD; Antonio Fernández-Ortiz, MD, PhD; José M. García-Ruiz, MD; Ana García-Álvarez, MD, PhD; Andrés Iñiguez, MD, PhD; Jesús Jiménez-Borreguero, MD; Pedro López-Romero, PhD; Rodrigo Fernández-Jiménez, MD; Javier Goicolea, MD, PhD; Borja Ruiz-Mateos, MD; Teresa Bastante, MD; Mercedes Arias, MD, PhD; José A. Iglesias-Vázquez, MD; Maite D. Rodriguez, RN; Noemí Escalera, BPT; Carlos Acebal, MD; José A. Cabrera, MD, PhD; Juan Valenciano, MD; Armando Pérez de Prado, MD, PhD; María J. Fernández-Campos, MD; Isabel Casado, MD; Juan C. García-Rubira, MD, PhD; Jaime García-Prieto, BSc; David Sanz-Rosa, PhD; Carlos Cuellas, MD, PhD; Rosana Hernández-Antolín, MD, PhD; Agustín Albarrán, MD, PhD; Felipe Fernández-Vázquez, MD, PhD; José M. de la Torre-Hernández, MD, PhD; Stuart Pocock, PhD; Ginés Sanz, MD, PhD; Valentin Fuster, MD, PhD 2013

