DE-MSING EMS: WHY I’D GET RID OF MORPHINE SULFATE

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PREHOSPITAL PAIN MANAGEMENT

- Morphine
- Fentanyl
- Hydromorphone
- Ketamine
- Ketorolac
- Tylenol
- Ibuprofen
- Lidocaine
- Whiskey
- Marijuana
MORPHINE IN HEART FAILURE

- Rationale
  - 1960s
    - Vasodilatory properties
      - Decreased venous tone
      - Increased venous pooling
        - Decreased cardiac filling pressures
    - Anxiolytic effects
      - Reducing sympathetic nervous system activity
        - Lowering preload and afterload
MORPHINE IN CHEST PAIN

• Rationale
  • Reduction of
    • Sympathetic stress
    • Catecholamine release
HIGHLY VARIABLE

- Metabolism
  - Enzyme UGT2B7
    - UDP-Glucuronosyltransferase-2B7
    - 2 active metabolites
  - Genetic polymorphisms in UGT
    - Darbari et al
      - Amer J Hematol 2008
  - Fentanyl/hydromorphone
    - CYP3A4
MORPHINE HARM

- Nausea/vomiting
  - 1/5 to 1/3
    - Smith et al
      - Eur J Pharmacol, 2014
- Hypotension
  - Weldon et al
    - Prehosp Emerg Care 2016
MORPHINE HARM

- Histamine release
  - Barke et al
    - Life Sci, 1993
  - Shapiro et al
    - Crit Care Med 1995
MORPHINE HARM

- Attenuated platelet inhibition
  - Clopidogrel
  - Prasugrel
  - Ticagrelor
    - Kubica et al (IMPRESSION)
      - Eur Heart J, 2016
    - Montalescot et al (ATLANTIC)
MORPHINE HARM

• Morphine may impair the absorption of anti-platelet and other oral drugs by inhibiting normal gastric activity
• 5-fold increased likelihood of high platelet reactivity
  • Parodi, et al
  • Circ Cardiov Interv, 2015
MORPHINE HARM

- Depressed myocardium
  - Riggs et al
    - Circ Shock, 2016
- Respiratory depression
  - Radke et al
    - Clin Rev Allergy Immunol, 2014
MORPHINE HARM

- ACS
  - Increased infarct size
  - Increased mortality
    - Meine et al (CRUSADE)
      - Am Heart J, 2005
MORPHINE IN HEART FAILURE

- Morphine increased the 30 day mortality when used in acute heart failure patients in the ED
  - At every time point
    - Miro et al, Chest 2017
FENTANYL

- Highly lipophilic
  - Crosses blood-brain barrier rapidly
    - Onset is around 30 seconds
    - Off in 20 minutes
- Less side effects
  - Fleischman et al
  - Prehospital Emerg Care, 2010
FENTANYL VERSUS MORPHINE FOR CHEST PAIN

- Fentanyl
- Comparable to morphine in providing analgesic effect
- Less nausea and 1/2 emesis
- Hypotension seen with morphine but not fentanyl
- Safe and effective alternative to morphine
- Weldon et al
- Prehospital Emerg Care 2016

COMPARISON OF FENTANYL AND MORPHINE IN THE PREHOSPITAL TREATMENT OF ISCHEMIC TYPE CHEST PAIN

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INTRODUCTION

Ischemic-type chest pain is the most common chief complaint resulting in transport to hospital. Currently, both fentanyl and/or morphine may be ordered by ALS providers with morphine being descriptively used to treat suspected ischemic-type chest pain. Given the large patient volume, there are operational and patient-safety-related advantages of utilizing a single-medicament agent.

In acute coronary syndromes (ACSs), sympathetic and adrenergic mechanisms are associated with myocardial ischemia, arrhythmia, and infantile death. As a result, anesthesia is an important therapeutic goal which is achieved with either fentanyl or morphine. Historically, morphine has been the analgesic of choice in ischemic cardiac pain. Morphine is endowed by the American Heart Association in 57 segment elevation myocardial infarction with a class 1 indication however, its use in acute coronary syndromes may be associated with increased mortality.

The modern era of cardiac care creates the demand for rapid diagnostic and treatment times involving all aspects of ACSs. First medical contact to treatment center time is typically limited to 30 minutes, while emergency transport time is important as this time is associated with improved outcomes. The drug of choice should be selected based on expected route of administration, allowing for more hemodynamic stability, infusion rates, and effectiveness of the drug before hospital setting.

The goal of this study was to evaluate the utility of fentanyl in a superior alternate first line analgesic for ischemic chest pain in the prehospital setting. We hypothesized that the administration of fentanyl in this setting would result in a lower incidence of hypotension compared with morphine.

METHODS

Case Identification

This was a prospective double-blind randomized controlled trial of morphine vs. fentanyl in the treatment of chest pain in the prehospital setting. Key words: chest pain, prehospital, morphine, fentanyl, acute pain.
TAKE HOME

• Morphine is unpredictable at best
• May cause harm
  • CHF
  • MI
    • Attenuating anti-platelet activity
• NSTEMI
TAKE HOME

• When you use opiates, switch to fentanyl if you have not already!
• If you need something longer acting, consider hydromorphone
EMS MUSEUM