Prehospital Opioid & Oxygen Administration to Acute Myocardial Infarction Patients: A Systematic Review

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Introduction
Opioids are routinely administered for analgesia to prehospital patients experiencing chest discomfort from acute myocardial infarction (AMI). We conducted a systematic review to determine if opioid administration impacts patient outcomes.

Methods
We conducted a systematic search using MeSH terms and keywords in Medline, Embase, Cochrane Database of Systematic Reviews, Cochrane Central and Clinicaltrials.gov for relevant randomized controlled trials and observational studies comparing opioid administration in AMI patients from 1990 to 2017. The outcomes of interest were: all-cause short-term mortality (≤30 days), major adverse cardiac events (MACE), platelet activity and aggregation, immediate adverse events, infarct size, and analgesia. Included studies were hand searched for additional citations. Risk of Bias assessments were performed and GRADE methodology was employed to assess quality and overall confidence in the effect estimate.

Results
Our search yielded 3001 citations of which 19 studies were reviewed as full texts and a total of 9 studies were included in the analysis. The studies predominantly reported on morphine as the opioid. Five studies reported on mortality (≤30 days), seven on MACE, four on platelet activity and aggregation, two on immediate adverse events, two on infarct size and none on analgesic effect. We found low quality evidence suggesting no benefit or harm in terms of mortality or MACE. However, low quality evidence indicates that opioids increase infarct size. Low-quality evidence also shows reduced serum P2Y12 (eg: clopidogrel and ticagrelor) active metabolite levels and increased platelet reactivity in the first several hours post administration following an increase in vomiting.

Conclusion
We find low and very low quality evidence that the administration of opioids in STEMI may be adversely related to vomiting and some surrogate outcomes including increased infarct size, reduced serum P2Y12 levels, and increased platelet activity. We found no clear benefit or harm on patient-oriented clinical outcomes including mortality.