Morphine sulphate analgesia did not affect diagnostic accuracy in undifferentiated abdominal pain


QUESTION: In patients with undifferentiated abdominal pain (UAP), does morphine sulphate (MS) analgesia affect physical examination and diagnostic accuracy?

Design
Randomised (allocation concealed)‡, blinded (patients, healthcare providers, data collectors, outcome assessors, data analysts)‡, controlled trial with intended follow up of 7 days after the study related emergency department (ED) visit.

Setting
A tertiary care centre in Boston, Massachusetts, USA.

Patients
74 patients who were ≥18 years (median age 39 y; 55% women), had severe abdominal pain of <72 hours duration, and were being seen in the ED. Patients were excluded if they were pregnant, hypotensive, or allergic to MS; if early opioid analgesia was clearly indicated; or if emergency interventions precluded study enrolment. Follow up was 100%.

Intervention
Patients were allocated to receive MS, 1 mg/ml (n = 36), or saline placebo (n = 36) for a 60 minute study period, during which the MS or placebo was titrated to a maximum of 15 mg at doses and frequencies determined by the treating physician. During the 60 minute study period, no other opioid analgesics were provided, but other medications were allowed (eg, antiemetics, H₂ blockers). Diagnostic and physical examinations assessments were recorded before and after the 60 minute study period.

Main outcome measures
Main outcomes were diagnostic accuracy and physical examination changes. Diagnostic accuracy was assessed as the proportion of patients having a post study (60 min) diagnostic list of up to 2 entities included in the “correct” diagnosis. The “correct” diagnosis was the ED discharge diagnosis for patients discharged from the ED, or the hospital discharge diagnosis for patients admitted to hospital.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>MS</th>
<th>Saline</th>
<th>RBR (95% CI)</th>
<th>NNH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall diagnostic accuracy</td>
<td>64%</td>
<td>67%</td>
<td>4% (–27 to 27)</td>
<td>Not significant</td>
</tr>
<tr>
<td>Change in diagnosis of tenderness</td>
<td>38%</td>
<td>31%</td>
<td>20% (–29 to 105)</td>
<td>Not significant</td>
</tr>
<tr>
<td>Change in location of pain</td>
<td>34%</td>
<td>41%</td>
<td>18% (–36 to 50)</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

‡RBR = relative benefit reduction. Other abbreviations defined in glossary; RBR, RRI, RRR, NNH, NNT, and CI calculated from data in article.

Main results
Analysis was by intention to treat. The MS group did not differ from the saline placebo group for overall diagnostic accuracy, any change occurring in the diagnostic list, overall likelihood of change in severity of tenderness, or change in location of pain (table).

Conclusion
In patients with undifferentiated abdominal pain, morphine sulphate analgesia does not affect physical examination or diagnostic accuracy.

*See glossary.
†Information provided by author.

COMMENTARY
Abdominal pain is the most common complaint seen in EDs in the US at 6.8 million visits in 2000. Although its outcome is rarely fatal, abdominal pain is responsible for a huge burden of suffering, a problem whose size far outweighs its level of research funding. The tradition of withholding opioid analgesics in patients with abdominal pain in order not to obscure the diagnosis has been challenged by several studies. The study by Thomas et al adds to an accumulating body of evidence that opioids neither increase nor decrease the likelihood of delayed diagnosis, while impressively confirming its analgesic benefit. This study is meticulous in its attention to certain trial methods. However, the systematic exclusion from this study of 91% of patients seen in the ED with abdominal pain is troubling. Although the exclusions do not favour 1 group over the other, many of the patients whose diagnoses are “missed” in the ED would have been excluded from this sample ("missed" cases being apical on average). Morphine use in such cases may obscure the examination more readily, leading to discharge from the ED and a greater chance for harm.

Safety was not an objective of this trial and, like other studies, this one is far too small to evaluate it. The 95% confidence bounds are consistent with a morphine induced reduction in “diagnostic accuracy” by as much as 27%. The prospect of increasing statistical power by combining similar studies exists, but dissimilarity of outcome measures will make this difficult. Also, according to the authors, “the aggregate number of patients in all relevant published studies falls below” the number necessary to detect a difference between groups should one exist.

Many more patients need to be studied before clinicians can make generalizable evidence-based decisions about analgesia. However, this study shows that in a select population of patients being seen in the ED with UAP, morphine does not appear to affect diagnostic accuracy.

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"Missed" appendicitis: common features discovered in cases after litigation