



Article Appraisal

Article: Chang et al., "Randomized Clinical Trial of Efficacy and Safety of a Single 2-mg Intravenous Dose of Hydromorphone Versus Usual Care in the Management of Acute Pain." AcadEmergMed (2013)

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Background and Study Objective(s)	Acute pain is often undertreated in the Emergency Department (ED). While close titration of analgesia is optimal for acute pain control, this is typically unrealistic in a busy ED. This study determined whether initial high dose hydromorphone (HM), (2mg IV) results in better pain control than usual care. The primary objective of the study was the difference in proportion of patients requesting additional analgesia at 30mins. Secondary outcomes: standard pain scores and safety outcomes.
Study Design	This was a single center prospective, randomized, unblinded clinical trial at an academic inner-city ED. It compared initial 2mg IV HM with a "usual care" analgesia. The study enrolled 350 patients aged 21-64 presenting to ED with pain deemed by the emergency physician (EP) to require parenteral opioids. Exclusion criteria included SBP <90, O2sat <95%, recent opioid use, chronic pain, and weight <150lbs (70 kg). Research associates consented and enrolled referred patients and collected data. Patients randomized to HM received 2mg at time zero, while "usual care" patients received analgesia as at the discretion of the treating EP. At 30mins patients were asked, "do you want more pain medication?". The difference between the two groups in response to this question was compared as the primary outcome. Secondary outcomes included numerical pain rating score change, Likert pain score change, and safety outcomes (naloxone use, desaturation <95%, systolic BP <90 mmHG, heart rate < 60/minute, nausea, vomiting, and pruritis.
Results	The two groups had similar baseline characteristics. The group receiving initial 2mg HM were less likely to request additional analgesia at 30 minutes by 11.6% (77.4% vs 65.8% CI 1.8-21%). The HM group also had improved numerical rating of their pain score, with an absolute reduction of 1.2 of 10 pts and had 14% more patients with a >50% pain score reduction, a score <4, or a Likert pain scale rating of either 'None' or 'Mild'. Safety outcomes were not significantly different between groups. There was a greater incidence of nausea and pruritis in the hydromorphone group, although only the difference in pruritis was statistically significant.
Validity of Results	It was felt that investigators did a good job of defining a clear question and comparing two groups with similar characteristics. The "omnibus" outcome of response to the question "do you want more pain medication", although intended to be a clinically relevant marker of real world efficacy, was felt to be problematic because the difference seen between groups might have arisen due to desire to avoid the side effects of hydromorphone (pruritis & nausea) rather than better analgesia. Furthermore, although the differences in pain score were statistically significant, their clinical significance was felt to be either minimal or questionable.
Generalizability of Results	The patient population was considered generalizable to many adult ED's although the high proportion of abdominal pain in the study cohort was felt to be unusual. Of note, all patients in HM group required continuous oxygen with 2L nasal prongs due to desaturations seen in a prior study; this was not deemed practical for most patients. Furthermore, significant concerns were raised about the willingness of nursing staff to routinely administer such high narcotic dosages due to safety concerns.
The Bottom Line	2mg IV Hydromorphone at time zero for acute pain, when administered with oxygen 2L by nasal prongs, is safe, but its modest pain reduction (possibly attributable to increased side effects), was not felt to justify its use as a one size fits all solution for acute pain in the ED.