

References and Literature Grading

Is There a Role for Intravenous Sub-Dissociative-Dose Ketamine Administered as an Adjunct to Opioids or as a Single Agent for Acute Pain Management in the ED? (9/6/2015)

1. Johansson P, Kongstad P, Johansson A. *The effect of combined treatment with morphine sulphate and low-dose ketamine in a prehospital setting.* Scand J Trauma Resusc Emerg Med. 2009 Nov 27;17:61.
2. Jennings PA, Cameron P, et al. *Morphine and ketamine is superior to morphine alone for out-of-hospital trauma analgesia: a randomized controlled trial.* Ann Emerg Med. 2012 Jun;59(6):497-503.
3. Jennings PA, Cameron P, Bernard S. *Ketamine as an analgesic in the pre-hospital setting: a systematic review.* Acta Anaesthesiol Scand. 2011 Jul;55(6):638-43
4. Galinski M, Dolveck F, et al. *Management of severe acute pain in emergency settings: ketamine reduces morphine consumption.* Am J Emerg Med. 2007 May;25(4):385-90
5. Ahern TL, Herring AA, Stone MB, Frazee BW. *Effective analgesia with low-dose ketamine and reduced dose hydromorphone in ED patients with severe pain.* Am J Emerg Med. 2013 May;31(5):847-51
6. Beaudoin FL, Lin C, Guan W, Merchant RC. *Low-dose ketamine improves pain relief in patients receiving intravenous opioids for acute pain in the emergency department: results of a randomized, double-blind, clinical trial.* Acad Emerg Med. 2014 Nov;21(11):1193-202
7. Miller JP, Schauer SG, Ganem VJ, Bebart VS. *Low-dose ketamine vs morphine for acute pain in the ED: a randomized controlled trial.* Am J Emerg Med. 2015 Jan 7. pii: S0735-6757 (14)00979-6. [Epub ahead of print]
8. Motov S, Rockoff B, et al. *Intravenous Subdissociative-Dose Ketamine Versus Morphine for Analgesia in the Emergency Department: A Randomized Controlled Trial.* Ann Emerg Med. 2015 Mar 26. pii: S0196-0644(15)00191-2. [Epub ahead of print]

Search: 2010-2015

Tier 1: 1 systematic review

Tier 2: 4 randomized controlled trials

Tier 3: 2 prospective observational studies

Reference and Associated Literature Grade	Grade	Quality	Comments
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<p>1. Johansson P, <u>Kongstad P</u>, <u>Johansson A</u>. <i>The effect of combined treatment with morphine sulphate and low-dose ketamine in a prehospital setting.</i> <u>Scand J Trauma Resusc Emerg Med.</u> 2009 Nov 27;17:61.</p>	C	Good	Prospective Clinical Cohort study-Supportive
<p>2. Jennings PA, <u>Cameron P</u>, et al. <i>Morphine and ketamine is superior to morphine alone for out-of-hospital trauma analgesia: a randomized controlled trial.</i> <u>Ann Emerg Med.</u> 2012 Jun;59(6):497-503.</p>	A	Outstanding	Randomized Controlled Trial-Supportive
<p>3. Jennings PA, <u>Cameron P</u>, <u>Bernard S</u>. <i>Ketamine as an analgesic in the pre-hospital setting: a systematic review.</i> <u>Acta Anaesthesiol Scand.</u> 2011 Jul;55(6):638-43</p>	D	Good	Systematic review-Supportive (Literature review with large exclusion criteria.) 6 articles included in review. No standardized approach for the 6 of them. Some had very small "N" (4 in one which limits its value.)
<p>4. Galinski M, <u>Dolveck F</u>, et al. <i>Management of severe acute pain in emergency settings: ketamine reduces morphine consumption.</i> <u>Am J Emerg Med.</u> 2007 May;25(4):385-90</p>	A	Good	Prospective, Multicenter, Randomized, Double-blind, Clinical trial. Supportive.
<p>5. Ahern TL, <u>Herring AA</u>, <u>Stone MB</u>, <u>Fraze BW</u>. <i>Effective analgesia with low-dose ketamine and reduced dose hydromorphone in ED patients with severe pain.</i> <u>Am J Emerg Med.</u> 2013 May;31(5):847-51</p>	C	Good	Prospective Observational study Supportive

<p>6. <u>Beaudoin FL, Lin C, Guan W, Merchant RC</u>. <i>Low-dose ketamine improves pain relief in patients receiving intravenous opioids for acute pain in the emergency department: results of a randomized, double-blind, clinical trial.</i> <u>Acad Emerg Med</u>. 2014 Nov;21(11):1193-202</p>	<p>A</p>	<p>Adequate</p>	<p>Randomized, Double-blind, Clinical trial- overall supportive Small sample size and authors' admitted "possible confounding..." issues with regard to the statement.</p>
<p>7. Miller JP, Schauer SG, Ganem VJ, Bebart VS. <i>Low-dose ketamine vs morphine for acute pain in the ED: a randomized controlled trial.</i> <u>Am J Emerg Med</u>. 2015 Jan 7. pii: S0735-6757 (14)00979-6. [Epub ahead of print]</p>	<p>A</p>	<p>Good</p>	<p>Prospective, Randomized, Double-blind, Clinical trial- Supportive small sample size Authors pointed out there were limitations.</p>
<p>8. Motov S, <u>Rockoff B</u>, et al. <i>Intravenous Subdissociative-Dose Ketamine Versus Morphine for Analgesia in the Emergency Department: A Randomized Controlled Trial.</i> <u>Ann Emerg Med</u>. 2015 Mar 26. pii: S0196-0644(15)00191-2. [Epub ahead of print]</p>	<p>A</p>	<p>Good</p>	<p>Prospective, , Randomized, Double-blind, Clinical trial – Supportive small sample size and "the potential for unblinding"</p>