
Abstract:

Abdominal pain is a common reason for emergency department visits in the United States. Failure to treat children's pain has long been considered substandard and unethical. Within the emergency department setting, pain has been repeatedly shown to be undertreated. Analgesic medications are suboptimally used for children with abdominal pain because of a wide variety of causes. To our knowledge, there is no standard of care for the treatment of such pain. As such, several recent studies have set out to determine the most appropriate methods to address this gap in knowledge. The proceeding article will attempt to review the literature as it pertains to severe acute abdominal pain, biliary colic, renal colic, and dysmenorrhea.

Keywords:

abdomen; pain; pediatrics; biliary colic; cholecystitis; renal colic; urolithiasis; dysmenorrhea

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Treating Abdominal Pain in Children: What Do We Know?

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Abdominal pain is one of the most common reasons for emergency department (ED) visits in the United States, accounting for 7.6 million visits in 2003.¹ Abdominal pain has a very large differential diagnosis. Although determining the etiology of a child's abdominal pain can be a complex task, it is essential not to lose sight of the fact that their chief complaint was just that: pain. Although every caregiver (and those children capable of comprehending) appreciates a well-explained definitive diagnosis, one would hazard a guess that they appreciate an evidence-based, well thought-out approach to treating their child's pain just as much, if not more.

Failure to treat pain has long been considered a substandard and unethical practice.² Concerns about inadequate treatment of pain in children have prompted policy statements and clinical reports by the American Academy of Pediatrics.^{3,4} There is no doubt that the pediatric community is now aware that children's pain deserves aggressive treatment for the purpose of relieving suffering. There have been significant improvements in pain assessment and management over the last decade. However, acute abdominal pain has remained somewhat off limits to analgesic treatment, primarily because of the concern by surgeons and others that pain is a crucial symptom of appendicitis and other acute abdominal processes.⁵ Even as recently as 2004, surgeons have voiced their concern that the use of analgesics may mask underlying conditions, leading to potential delays in appropriate surgical intervention.⁶

Unfortunately, current literature would suggest that emergency physicians (EPs) do not always treat pain as effectively as we

might aspire to. Within the ED setting, pain has been repeatedly shown to be undertreated.⁷⁻⁹ A recently conducted North American study assessed the current state of ED pain management and found that patients present with high levels of pain, analgesia is underused, and when used, there are significant delays in analgesia delivery.¹⁰ No standard of care exists for the management of acute abdominal pain in children. A 2003 retrospective medical record review of pathology-proven appendicitis in adults found that only 40% of patients received any analgesia in the ED.¹¹ Similarly, a Canadian pediatric ED study found that only half of children with a working diagnosis of appendicitis received analgesia.¹² In this study, 24% of those who received opioids were underdosed. The highest recorded rates of analgesia administration for abdominal pain were reported in an audit of 10 pediatric EDs across Australia and New Zealand; still, the rates only reached 62%, and the median time to parenteral medication administration was over 2 hours.¹³

The World Health Organization supports optimal pain treatment as a fundamental human right.^{14,15} Inadequate pain management during medical care, especially among children, can have longstanding detrimental effects. It can result in extended length of stay, slower healing, emotional trauma and suffering. Negative effects extend to adulthood and include fear of medical events or healthcare consultations and avoidance of subsequent medical care.¹⁶⁻¹⁸ Furthermore, inadequate analgesia in young children can reduce the effect of analgesia at a future point in time, whereas pain experiences in infants may alter future pain processing.¹⁹

Analgesic medications are suboptimally used for children with abdominal pain for a variety of reasons. Several recent studies have set out to determine the most appropriate methods to address this gap in knowledge. The proceeding sections of this article will attempt to review the literature because it pertains to severe acute abdominal pain, biliary colic, renal colic, and dysmenorrhea.

SEVERE ACUTE ABDOMINAL PAIN

Severe acute abdominal pain or the so-called suspected acute abdomen has long been a challenge for clinicians, both in terms of diagnosis and treatment. There has been great debate regarding the use of analgesics, particularly narcotics, before surgical assessment of the patient. This practice stems from the fear that treatment of the child's pain might "mask" the underlying problem, there-

by delaying definitive diagnosis and possibly resulting in morbidity. Despite advances in this area over the last 2 decades, current medical practice continues to favor the withholding of analgesia in patients with suspected appendicitis, a common cause of "acute abdomen" in children.^{20,21} Emergency physicians continue to be concerned about surgeon disapproval of their actions, despite mounting evidence to support the provision of analgesia to such patients.²⁰

A 2007 Cochrane review by Manterola et al²² included 6 randomized controlled trials of adults with acute abdominal pain. Their review supported the use of opioid analgesia in patients with acute abdominal pain to relieve discomfort; this practice did not retard the decision to treat. A recent JAMA article²³ reviewed the literature regarding opioid use in patients with acute abdominal pain. Both pooled adult (9 trials) and pediatric (3 trials) data showed statistically insignificant trends toward increased risks of altered findings on the abdominal examination after opiate administration, with risk ratios for changes in the clinical examination of 1.51 (95% confidence interval [CI], 0.85-2.69) and 2.11 (95% CI, 0.60-7.35), respectively.²³ Opiate administration had no significant association with management errors (0.3% absolute increase; 95% CI, -4.1% to +4.7%). Across studies with adequate analgesia (defined as those studies where receiving an active drug resulted in statistically lower pain scores than with placebo), opioid administration was associated with a nonsignificant absolute decrease in the risk of management errors (-0.2%; 95% CI, -4.0% to +3.6%). When focusing on the 3 pediatric trials, a nonsignificant absolute decrease in management errors (-0.8%; 95% CI, -8.6% to +6.9%) was still demonstrated.

Kim et al²⁴ studied 60 children, aged 5 to 18 years, who presented to an ED with less than 5 days of abdominal pain. They were randomized to receive either intravenous morphine (0.1 mg/kg) or placebo. Patients were examined by both pediatric ED attendings and surgical residents. This study noted no significant change in diagnostic accuracy or physical examination findings (eg, area of tenderness). Green et al²⁵ studied 108 Canadian children, aged 5 to 16 years, who presented to the ED with acute abdominal pain of less than 48 hours and required surgical consultation. The patients were randomized to receive either intravenous morphine (0.05 mg/kg) or nothing and were assessed by pediatric ED attending physicians. Morphine administration did not increase the rate of missed appendicitis, affect diagnostic accuracy, or increase the rate of perforated appendicitis. In addition,

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