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Weight of evidence favours ketamine for children having fracture reduction

Research question What is the best way to provide sedation and pain relief to children having a fracture reduced in the emergency department?

Answer It's hard to say for certain, but for systemic sedation and pain relief, ketamine plus midazolam seems safer and more effective than other combinations.

Why did the authors do the study? No consensus exists on the best way to provide children with sedation and pain relief during fracture reductions in the emergency department. These authors wanted to weigh up all the randomised evidence comparing different methods of sedation and pain relief to find out which was the safest and most effective.

What did they do? They systematically searched research databases including Medline, the Cochrane Collaboration and Clinical Trials Database, and CINAHL (Cumulative Index to Nursing and Allied Health Literature) for randomised controlled trials published in English. They also hand searched reference lists and made limited attempts to find relevant unpublished trials. They included all comparative trials that were adequately randomised, whether or not blinding had been attempted.

The authors found eight relevant trials, but they were too heterogeneous to combine in a meta-analysis. Instead, they extracted and compared data on pain reported by children after various forms of sedation and analgesia. They also looked for data on surrogate measures for pain, such as patient or parent satisfaction, and for data on complications such as apnoea and hypotension.

What did they find? Eight randomised controlled trials were included in this systematic review. The data on biers blocks (regional anaesthesia) and nitrous oxide were too limited to make useful comparisons.

Of the intravenous combinations, ketamine plus midazolam seemed to work best, providing better pain relief with fewer respiratory complications than midazolam plus fentanyl or propofol plus fentanyl. In the biggest trial (n=260), children given ketamine plus midazolam were less likely to have hypoxia (6% *v* 25%, $P<0.001$), had significantly lower pain scores, and significantly lower parental anxiety scores than children given midazolam plus fentanyl. But they took significantly longer to recover (127.6 (SD 56.2) minutes *v* 113.7 (36.9); $P=0.05$). Ketamine was not associated with an increased risk of agitation in this trial, but it did cause more vomiting than midazolam plus fentanyl. In a second, smaller trial (n=113) ketamine plus midazolam was associated with less distress, fewer respiratory problems, and a longer recovery time than propofol plus fentanyl.

What does it mean? Although the weight of evidence in this review favours the ketamine plus midazolam combination for these children, the overall body of research is too weak to be conclusive. The trials were generally small and used different, often unvalidated outcome scores. Few were adequately blinded, so it's hard to rule out bias. Ketamine, etomidate, propofol, and nitrous oxide all need further study, say the authors, preferably in big trials using standardised instruments such as the Children's Hospital of Eastern Ontario pain score.

Migita RT et al. Sedation and analgesia for pediatric fracture reduction in the emergency department: a systematic review. *Arch Pediatr Adolesc Med* 2006;160:46-51

Editor's choice

Trust and demand

Last week's Editor's Choice argued that health care was too important to be left to politicians and that Britain's National Health Service should be made independent of government. This week 900 British doctors have written to politicians to argue that the NHS is unsustainable and that it is time to look at new ways of delivering health care in the UK (p 813). What prompts this demand for new thinking is the service's financial crisis, which is seeing pay awards staged and jobs cut (p 813). Yet I wonder how apparent the crisis is to patients: several recent exposures to the NHS, through friends and family in different parts of the country, have shown exemplary service.

Nevertheless, the sense of crisis and of unstoppable demand persists. Doctors for Reform argue that the NHS is simply too monolithic, and that a mixed economy might better manage demand, improve choice, and allow professionals to "retain the essential bond of trust with their patients."

The same tension between trust and demand emerges in an examination of referral management centres by Myfanwy Davies and Glyn Elwyn (p 844). The concept arose in the mid 1990s in the US, when insurance companies introduced referral management to sanction (or otherwise) referrals from generalists for specialist care. In the UK referral management centres seem to have sprung up quickly—seemingly in response to the current financial crisis as primary care trusts try to curb their spending by questioning and delaying referrals. Davies and Elwyn examine the evidence for the effectiveness of referral management systems—and fail to find any. In her commentary on the article Iona Heath sees referral management as a further stage in the "relentless commodification of health care," weakening relationships of trust. She points out that any barrier to easy referral between generalists and specialists risks the safety of patients and the cost effectiveness of the generalist-specialist system. James Owen Drife agrees: "The reasons behind [this proposal] are desire for managerial control and ignorance of how efficient the system already is."

The sort of knowledge of patients that Heath talks about is also at the heart of Bassem Saab and Jumana Antoun's personal view (p 860). They ask doctors to be responsible for the consequences of their decisions on patients' healthcare costs and poverty—and not be influenced by the seductions of drug companies or new technologies. They want doctors to realise that the difference between a branded and a generic version of atenolol is 1.5 days' pay for a lowly paid Lebanese government worker and that they shouldn't suggest magnetic resonance imaging just because the technology is available. "As health professionals we may not have the power to change political regimes or put an end to wars and disease. But we can ensure that we are in charge of what we do." As William Blake said, "He who would do good to another, must do it in minute particulars."

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