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Perioperative dexmedetomidine for acute pain after abdominal surgery in adults.

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Abstract

BACKGROUND: Acute postoperative pain is still an issue in patients undergoing abdominal surgery. Postoperative pain and side effects of analgesic treatment, in particular those of opioids, need to be minimized. Opioid-sparing analgesics, possibly including dexmedetomidine, seem a promising avenue by which to improve postoperative outcomes.

OBJECTIVES: Our primary aim was to determine the analgesic efficacy and opioid-sparing effect of perioperative dexmedetomidine for acute pain after abdominal surgery in adults.Secondary aims were to establish effects of dexmedetomidine on postoperative nausea and vomiting (PONV), gastrointestinal function and mobilization, together with the side effect profile of dexmedetomidine.

SEARCH METHODS: We searched the following databases: Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, Institute for Scientific Information (ISI), Web of Science and Cumulative Index to Nursing and Allied Health Literature (CINAHL), and reference lists of articles to May 2014. We searched the Science Citation Index, ClinicalTrials.gov and Current Controlled Trials, and we contacted pharmaceutical companies to identify unpublished and ongoing studies. We applied no language restrictions. We reran the search in May 2015 and found nine studies of interest. We will deal with the studies of interest when we update the review.

SELECTION CRITERIA: We included randomized, controlled trials of perioperative dexmedetomidine versus placebo or other drug during abdominal surgery in adults. Trials included one of the following outcomes: amount of 'rescue' opioid, postoperative pain, time to 'rescue' analgesia, participants requiring 'rescue' analgesia, postoperative sedation, PONV, time to first passage of flatus and stool or time to first out-of-bed mobilization.

DATA COLLECTION AND ANALYSIS: Two review authors independently screened the titles and abstracts for eligibility. We retrieved full trial reports if necessary, and we extracted relevant data from the included studies using a data collection form and assessed risk of bias. We resolved disagreements by discussion with the third review author. We sought additional information of relevance for risk of bias assessment or extraction of data by contacting study authors or, if necessary, co-authors from present or former studies.

MAIN RESULTS: Our systematic review included seven studies with a total of 492 participants. We included 422 participants in our analysis. Thirteen studies are awaiting classification. For the comparison dexmedetomidine versus placebo (six studies, 402 participants), most studies found a reduction in 'rescue' opioid consumption in the first 24 hours after surgery, together with in general no clinically important differences in postoperative pain (visual analogue scale (VAS) 0 to 100 mm, where 0 = no pain and 100 = worst imaginable pain) in the first 24 hours after surgery - except for one study (80 participants) with a reduction in VAS pain at two hours after surgery in favour of dexmedetomidine, with a mean difference of -30.00 mm (95% confidence interval (CI) -38.25 to -21.75). As the result of substantial heterogeneity, pooling of data in statistical meta-analyses was not appropriate. The quality of evidence was very low for our primary outcomes because of imprecision of results and risk of bias. Regarding our secondary aims, evidence was too scant in general to allow robust conclusions, or the estimates too imprecise or of poor methodological quality. Regarding adverse effects, low quality data (one study, 80 participants) suggest that the proportion of participants with hypotension requiring intervention was slightly higher in the high-dose dexmedetomidine group with a risk ratio of 2.50 (95% CI 0.94 to 6.66), but lower doses of dexmedetomidine led to no differences compared with control. Evidence for the comparison dexmedetomidine versus fentanyl was insufficient to permit robust conclusions (one study, 20 participants).

AUTHORS' CONCLUSIONS: Dexmedetomidine, when administered perioperatively for acute pain after abdominal surgery in adults, seemed to have some opioid-sparing effect together with in general no important differences in postoperative pain when compared with placebo. However the quality of the evidence was very low as the result of imprecision, methodological limitations and substantial heterogeneity among the seven included studies. The clinical importance for patients is uncertain, in as much as the influence of dexmedetomidine on patient-important outcomes such as gastrointestinal function, mobilization and adverse effects could not be satisfactorily determined. All included studies were relatively small, and publication bias could not be ruled out. Applicability of evidence was limited to middle-aged participants who were relatively free of co-morbidity and were undergoing elective abdominal surgery. A potential bias was a considerable quantity of

unobtainable data from studies with mixed surgery. To detect and investigate patient-important outcomes, larger studies with longer periods of follow-up are needed.

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