

Alpha₂-agonists and Outcome

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Clonidine is a well-known alpha₂-adrenergic agonist with sedative and analgesic properties. It has been shown to reduce shivering, anaesthetic drug requirements for both volatile and intravenous anaesthetic agents, some adverse haemodynamic events, and improve pain control after surgery. The main drawback of clonidine is its long duration of action and variable dose-response, such that some patients have unwanted bradycardia and hypotension, as well as occasional residual postoperative sedation. Dexmedetomidine is a short-acting IV alpha₂-agonist. Its major benefit is its titratability. Dexmedetomidine is being used as a sedative for monitored anesthesia care because of its analgesia, cooperative sedation and lack of respiratory depression.

The surgical stress response may aggravate perioperative cardiac complications. Randomised trials have shown that clonidine can improve renal function, reduce myocardial ischaemia, and possibly myocardial infarction and early death. A Cochrane review and meta-analysis that included 31 trials (4578 patients) found that alpha₂-agonists reduced mortality (RR 0.66; 95% CI 0.44 - 0.98; P = 0.04) and myocardial ischaemia (RR 0.68; 95% CI 0.57 - 0.81; P <0.001). Another systematic review of the effects of dexmedetomidine on cardiac outcomes following noncardiac surgery identified 20 trials (840 patients). Dexmedetomidine was associated with a trend towards improved cardiac outcomes; all-cause mortality (OR 0.27; 95% CI 0.01-7.13, P = 0.44), MI (OR 0.26; 95% CI 0.04-1.60, P = 0.14), and myocardial ischaemia (OR 0.65; 95% CI 0.26-1.63, P = 0.36).

Dexmedetomidine is typically used for sedation. An RCT in 326 patients having monitored anaesthesia care (and regional block) found that a dexmedetomidine infusion at 0.2-1.0 µg/kg/h could reduce midazolam and fentanyl requirements. Patient satisfaction was higher with dexmedetomidine. Dexmedetomidine has also been evaluated in neurosurgical anaesthesia. Dexmedetomidine increased perioperative haemodynamic stability, and was associated with faster tracheal extubation and without respiratory depression when compared with fentanyl.

PJ Devereaux (of POISE beta-blocker fame) is leading a collaboration called POISE-2 to test the effectiveness of clonidine in non-cardiac surgery.

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