Cochrane Corner

Bispectral Index for Improving Anesthetic Delivery and Postoperative Recovery

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BACKGROUND: The use of clinical signs may not be reliable for measuring the hypnotic component of anesthesia. The use of bispectral index (BIS) to guide the dose of anesthetics may have certain advantages over clinical signs.
OBJECTIVES: Our objective in this review was to assess whether BIS reduced anesthetic use, recovery times, recall awareness, and cost.
SEARCH STRATEGY: We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2007, Issue 2), MEDLINE (1990 to May 2007), EMBASE (1990 to May 2007), and reference lists of articles.
SELECTION CRITERIA: We included randomized controlled trials comparing BIS with clinical signs in titrating anesthetics.
DATA COLLECTION AND ANALYSIS: Two authors independently assessed trial quality, extracted data, and analyzed the data. We contacted study authors for further details.
MAIN RESULTS: We included 20 studies with 4056 participants. Seven recent trials are still awaiting assessment. BIS-guided anesthesia reduced the requirement for propofol by 1.30 mg · kg^{-1} · h^{-1} [578 participants; 95% confidence interval (CI) −1.97 to −0.62] and for volatile anesthetics (desflurane, sevoflurane, and isoflurane) by 0.17 minimal alveolar concentration equivalents (689 participants; 95% CI: −0.27 to −0.07). Irrespective of the anesthetic, BIS reduced the recovery times: time for eye opening by 2.43 min (996 participants; 95% CI: −3.60 to −1.27), response to verbal command by 2.28 min (717 participants; 95% CI: −3.47 to −1.09), time to tracheal extubation by 3.05 min (1057 participants; 95% CI: −3.98 to −2.11), and orientation by 2.46 min (316 participants; 95% CI: −3.21 to −1.71). BIS shortened the duration of postanesthesia care unit stay by 6.83 min (584 participants; 95% CI: −12.08 to −1.58) but did not reduce time to home readiness (329 participants; 95% CI: −30.11 to 16.09). The BIS-guided anesthesia significantly reduced the incidence of intraoperative recall awareness in surgical patients with high risk of awareness (odds ratio, 0.20; 95% CI: 0.05–0.79).
AUTHORS' CONCLUSIONS: Anesthesia guided by BIS within the recommended range (40–60) could improve anesthetic delivery and postoperative recovery from relatively deep anesthesia. In addition, BIS-guided anesthesia has a significant impact on reduction of the incidence of intraoperative recall in surgical patients with a high risk of awareness.

The full review is available: Punjasawadwong Y, Boonjeungmonkol N, Phongchiewboon A. Bispectral index for improving anesthetic delivery and postoperative recovery. *Cochrane Database Syst Rev* 2007, Issue 4. Art. No.: CD003843. DOI: 10.1002/14651858.CD003843.pub2. Copyright © 2005 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd. Reproduced with permission.

Closed Tracheal Suction Systems Versus Open Tracheal Suction Systems for Mechanically Ventilated Adult Patients

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BACKGROUND: Ventilator-associated pneumonia is a common complication in ventilated patients. Endotracheal suctioning is a procedure that may constitute a risk factor for ventilator-associated pneumonia. It can be performed with an open system or with a closed system. In view of suggested advantages being reported for the closed system, a systematic review comparing both techniques was warranted.
OBJECTIVES: We compared the closed tracheal suction system and the open tracheal suction system in adults receiving mechanical ventilation for more than 24 h.
SEARCH STRATEGY: We searched CENTRAL (*The Cochrane Library* 2006, Issue 1) MEDLINE, CINAHL, EMBASE, and LILACS from their inception to July 2006. We hand-searched the bibliographies of relevant identified studies, and contacted authors and manufacturers.
SELECTION CRITERIA: The review included randomized controlled trials comparing closed and open tracheal suction systems in adult patients who were ventilated for more than 24 h.
DATA COLLECTION AND ANALYSIS: We included the relevant trials fitting the selection criteria. We assessed methodological quality using method of randomization, concealment of allocation, blinding of outcome assessment, and completeness of follow-up. Effect measures used for pooled analyses were relative risk (RR) for dichotomous data and weighted mean differences for continuous data. We assessed heterogeneity before meta-analysis.
MAIN RESULTS: Of the 51 potentially eligible references, the review included 16 trials (1684 patients), many with methodological weaknesses. The two tracheal suction systems showed no differences in risk of ventilator-associated pneumonia (11 trials; RR: 0.88; 95% CI: 0.70–1.12), mortality (5 trials; RR: 1.02; 95% CI: 0.84–1.23), or length of stay in intensive care units (2 trials; weighted mean differences, 0.44; 95% CI: −0.92 to 1.80). The closed tracheal suction system produced higher bacterial colonization rates (5 trials; RR: 1.49; 95% CI: 1.09–2.03).
AUTHORS' CONCLUSIONS: Results from 16 trials showed that suctioning with either closed or open tracheal suction systems did not have an effect on the risk of ventilator-associated pneumonia or mortality. More studies of high methodological quality are required, particularly to clarify the benefits and hazards of the closed tracheal suction system for different modes of ventilation and in different types of patients.

The full review is available: Subirana M, Solà I, Benito S. Closed tracheal suction systems versus open tracheal suction systems for mechanically ventilated adult patients. *Cochrane Database Syst Rev* 2007, Issue 4. Art. No.: CD004581. DOI: 10.1002/14651858.CD004581.pub2 Copyright © 2005 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd. Reproduced with permission.

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