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[Intervention Review]

Incentive spirometry for prevention of postoperative pulmonary complications in upper abdominal surgery

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Editorial group: Cochrane Anaesthesia Group.

Publication status and date: Edited (no change to conclusions), published in Issue 11, 2013.

Review content assessed as up-to-date: 14 July 2006.

Citation: Guimarães MMF, El Dib R, Smith AF, Matos D. Incentive spirometry for prevention of postoperative pulmonary complications in upper abdominal surgery. *Cochrane Database of Systematic Reviews* 2009, Issue 3. Art. No.: CD006058. DOI: 10.1002/14651858.CD006058.pub2.

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ABSTRACT

Background

Upper abdominal surgical procedures are associated with a high risk of postoperative pulmonary complications. The risk and severity of postoperative pulmonary complications can be reduced by the judicious use of therapeutic manoeuvres that increase lung volume. Our objective was to assess the effect of incentive spirometry (IS) compared to no therapy, or physiotherapy including coughing and deep breathing, on all-cause postoperative pulmonary complications and mortality in adult patients admitted for upper abdominal surgery.

Objectives

To assess the effects of incentive spirometry compared to no such therapy (or other therapy) on all-cause postoperative pulmonary complications (atelectasis, acute respiratory inadequacy) and mortality in adult patients admitted for upper abdominal surgery.

Search methods

We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2006, Issue 3), MEDLINE, EMBASE, and LILACS (from inception to July 2006). There were no language restrictions.

Selection criteria

We included randomized controlled trials of incentive spirometry in adult patients admitted for any type of upper abdominal surgery, including patients undergoing laparoscopic procedures.

Data collection and analysis

Two authors independently assessed trial quality and extracted data.

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Main results

We included 11 studies with a total of 1754 participants. Many trials were of only moderate methodological quality and did not report on compliance with the prescribed therapy. Data from only 1160 patients could be included in the meta-analysis. Three trials (120 patients) compared the effects of incentive spirometry with no respiratory treatment. Two trials (194 patients) compared incentive spirometry with deep breathing exercises. Two trials (946 patients) compared incentive spirometry with other chest physiotherapy. All showed no evidence of a statistically significant effect of incentive spirometry. There was no evidence that incentive spirometry is effective in the prevention of pulmonary complications.

Authors' conclusions

We found no evidence regarding the effectiveness of the use of incentive spirometry for prevention of postoperative pulmonary complications in upper abdominal surgery. This review underlines the urgent need to conduct well-designed trials in this field. There is a case for large randomized trials of high methodological rigour in order to define any benefit from the use of incentive spirometry regarding mortality.

PLAIN LANGUAGE SUMMARY

Incentive spirometry (IS) for prevention of postoperative pulmonary complications after upper abdominal surgery

Previous studies have suggested that between 17% and 88% of people having surgery to the upper abdomen will suffer complications that affect their lungs after the operation (postoperative pulmonary complications). These complications can be made less likely and less severe with the careful use of treatments designed to increase the volume of the lungs, as these volumes tend to fall after such surgery. These treatments encourage breathing in (inspiration). Incentive spirometers are mechanical devices developed to help people take long, deep, and slow breaths to increase lung inflation. This review included 11 studies with a total of 1754 participants. We found no evidence to support the use of incentive spirometry for prevention of postoperative pulmonary complications following upper abdominal surgery.