Propofol vs traditional sedative agents for endoscopic retrograde cholangiopancreatography: a meta-analysis

Bo LL, Bai Y, Bian JJ, Wen PS, Li JB, Deng XM

CRD summary
The review concluded that propofol sedation during endoscopic retrograde cholangiopancreatography led to shorter recovery time without an increase in cardiopulmonary side-effects. The review was generally well conducted. The authors’ conclusions are based on the evidence and appear reasonable. The call for further research on side-effects, notably hypotension, appears warranted.

Authors’ objectives
To investigate the efficacy and safety of propofol sedation for endoscopic retrograde cholangiopancreatography (ERCP).

Searching
PubMed, EMBASE and Cochrane Central Register of Controlled Trials (CENTRAL) were searched to October 2010 for articles in any language. Search terms were reported. Reference lists of retrieved articles were searched. Electronic searches of Google Scholar and Yahoo were conducted. Major conference proceedings were handsearched.

Study selection
Randomised controlled trials (RCTs) of propofol versus standard sedation (including meperidine, midazolam, scopolamine and pentazocine) in adult patients (>18 years) who underwent ERCP were eligible for inclusion. Trials had to report outcomes such as patient monitoring, complications, ERCP duration, sedation and recovery time. Trials that did not provide actual frequencies of complications were excluded. Trials of propofol in combination with other agents were excluded.

The included trials studied propofol versus meperidine plus scopolamine, midazolam, meperidine plus midazolam or midazolam plus pentazocine in patients who underwent ERCP. Study locations included Germany, Israel, China and Thailand. Most of the patients who required ERCP had biliary disease. Propofol was primarily administered by anaesthesiologists or intensive care unit physicians.

Two reviewers performed the study selection. Disagreements were resolved by consensus or discussion with a third reviewer.

Assessment of study quality
Trial quality was assessed with the Jadad scale of randomisation blinding, and full accounting of all patients to give a maximum score of 5.

Two reviewers performed quality assessment. Disagreements were resolved by consensus or discussion with a third reviewer.

Data extraction
Data were extracted on sedation-related outcomes and procedure-related outcomes. These were used to calculate odds ratios (OR) or mean differences, together with 95% confidence intervals (CIs). Trial authors were contacted for missing data.

Two reviewers performed data extraction. Disagreements were resolved by consensus or discussion with a third reviewer.

Methods of synthesis
Fixed-effect meta-analysis was used to calculate pooled weighted mean differences (WMD) and odds ratios, each with 95% CIs. Statistical heterogeneity was assessed using $I^2$ and $X^2$. Where statistical heterogeneity was detected ($p<0.1$)
random-effects meta-analysis was used. Sensitivity analysis was conducted on the basis of study quality where statistical heterogeneity was detected with random effect meta-analysis. Publication bias was assessed using funnel plots.

Results of the review

Six trials (663 participants, range 32 to 197) were included in the review. Three trials scored 5 on the Jadad scale, one trial scored 4 and two trials scored 2.

Compared with control, there was a statistically significantly decrease in recovery time with propofol (WMD -18.69 minutes, 95% CI -25.44 to -11.93, I²=91%; five RCTs). Sensitivity analysis excluding two poor quality trials did not significantly alter this result. There was no significant difference in the length of procedure time (three RCTs) or risk of hypotension (four RCTs) and hypoxia (four RCTs).

The funnel plot was asymmetric, which indicated publication bias.

Authors’ conclusions

Propofol sedation during ERCP led to shorter recovery time without an increase in cardiopulmonary side-effects.

CRD commentary

Inclusion criteria for the review were clearly defined. Several relevant data sources were searched. There were no language restrictions. Publication bias was assessed and detected, although the meaningfulness of this assessment with fewer than 10 trials was questionable. Attempts were made to reduce reviewer error and bias throughout the review process. Quality assessment indicated that most of the trials were of high quality and two were poor quality.

Trials were combined using standard statistical methods. Statistical heterogeneity was assessed. Some of the outcomes had high levels of statistical heterogeneity; this was explored in sensitivity analyses.

The review was generally well conducted. The authors’ conclusions are based on the evidence and appear reasonable. The authors’ call for further research on side-effects, notably hypotension, appears warranted.

Implications of the review for practice and research

The authors did not state any implications for practice.

Research: The authors stated a need for future studies with large numbers of patients were needed to determine the safety of propofol, especially with regards to hypotension. Study authors should aim to report outcomes in a uniform manner.

Funding

The Department of Anesthesiology and Intensive Care, Shanghai Hospital, Shanghai, China.

Bibliographic details


PubMedID

21941422

DOI

10.3748/wjg.v17.i30.3538

Original Paper URL

http://www.wjgnet.com/1007-9327/abstract/v17/i30/3538.htm

Indexing Status

Subject indexing assigned by NLM
MeSH
Cholangiopancreatography, Endoscopic Retrograde /methods; Clinical Trials as Topic; Databases, Factual; Humans; Hypnotics and Sedatives; Propofol

AccessionNumber
12011006021

Date bibliographic record published
26/01/2012

Date abstract record published
30/04/2012

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.