Prophylactic antibiotics for mesh inguinal hernioplasty: a meta-analysis
Sanabria A, Dominguez L C, Valdivieso E, Gomez G

CRD summary
This well-conducted review concluded that antibiotic prophylaxis reduces the rate of surgical site infection by almost half in patients undergoing mesh inguinal hernioplasty. The authors’ conclusions are likely to be reliable.

Authors’ objectives
To evaluate the effectiveness of antibiotic prophylaxis in patients undergoing mesh inguinal hernioplasty.

Searching
The Cochrane Library, EMBASE, MEDLINE, LILACS and a Hernia Trialists Collaboration database were searched for studies published after 1985; the search terms were reported. No language restrictions were applied.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) with an outcome follow-up of up to 1 year were eligible for inclusion. The duration of follow-up in the included studies ranged from no follow-up to 2 years.

Specific interventions included in the review
Studies that compared antibiotic prophylaxis with no antibiotics or placebo were eligible for inclusion. The included studies evaluated intravenous cefazolin (1 or 2 g), erythromycin (1 g where cefazolin allergy existed), ampicillin-sulbactam (1.5 g), amoxicillin plus clavulanic acid (2 g) and cefuroxime (1.5 g). Drugs were administered at anaesthetic induction or before surgical incision. Where reported, studies used a saline solution as the placebo control. Most hernias were repaired using polypropylene mesh and, where specified, the Lichtenstein technique was used.

Participants included in the review
Studies of adults undergoing elective mesh inguinal hernioplasty, including those without contraindications to antibiotics, were eligible for inclusion. Studies of patients who were immunosuppressed due to disease or medication were excluded. The participants in the included studies had inguinal or groin hernia; some studies excluded patients with bilateral hernias and other excluded recurrent hernias.

Outcomes assessed in the review
Studies that assessed surgical site infection (SSI) as defined by the Center for Disease Control were eligible for inclusion.

How were decisions on the relevance of primary studies made?
Two reviewers independently selected the studies and any disagreements were resolved by consensus.

Assessment of study quality
Validity was assessed using the following criteria described by the Cochrane Collaboration: randomisation, allocation concealment, blinded assessment of the outcomes, losses to follow-up, intention-to-treat analysis, description of statistical analysis, description of intervention, and clinical homogeneity.

Data extraction
Two reviewers independently extracted the data and any disagreements were resolved by consensus. For each study, the number of SSIs in the treatment and control groups were extracted.
Methods of synthesis

How were the studies combined?
A pooled odds ratio (OR) of SSIs with 95% confidence intervals (CIs) was calculated using the fixed-effect Mantel-Haenszel model. The number-needed-to-treat with 95% CI was calculated using the Cates method. Publication bias was assessed using a funnel plot and tested using Begg’s test.

How were differences between studies investigated?
Statistical heterogeneity was assessed using the Q statistic (significance threshold of p<0.1). A sensitivity analysis which excluded studies of low quality was performed.

Results of the review

Six RCTs (n=2,507) were included.

In relation to study quality, four studies reported allocation concealment, five reported blind assessment of the outcomes, five reported methods of statistical analysis, and three reported loss to follow-up ranging from 0 to 3.6%. All six studies reported intention-to-treat analysis, described the intervention and were clinically homogeneous.

The likelihood of an SSI was significantly reduced in patients receiving prophylactic antibiotics compared with control (OR 0.48, 95% CI: 0.27, 0.85). No evidence of significant heterogeneity was found (p=0.17). The corresponding number-needed-to-treat to prevent one SSI was 66 (95% CI: 38, 258).

The funnel plot suggested the absence of negative studies but Begg's test showed no evidence of publication bias (p=0.348). The authors extended the search but did not identify additional studies for inclusion.

Authors’ conclusions

Antibiotic prophylaxis reduces the rate of SSI by almost half in patients undergoing mesh inguinal hernioplasty.

CRD commentary

The review addressed a clear question that was defined in terms of the participants, intervention, outcomes and study design. Several relevant sources were searched and attempts were made to minimise language bias; use of a topic-specific trialist collaboration may have minimised publication bias. Publication bias was assessed and some evidence was found; however, the assessment was of limited value due to the small number of studies. Two reviewers independently selected the studies, assessed validity and extracted the data, thus reducing the potential for reviewer bias and errors. Study validity was assessed and the results were reported. The details presented on the included studies would suggest that it was appropriate to combine the studies using a meta-analysis. Statistical heterogeneity was assessed using appropriate methods. This was a well-conducted and reported review and the authors’ conclusions are likely to be reliable.

Implications of the review for practice and research

Practice: The authors stated that clinicians and hospitals should take local SSI rates into account when deciding whether or not to use prophylactic antibiotics in mesh inguinal hernioplasty. Where SSI rates are low (1%), the cost-effectiveness of antibiotic prophylaxis should be considered.

Research: The authors did not state any implications for further research.

Bibliographic details

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.