

## CAGS AND ACS EVIDENCE-BASED REVIEWS IN SURGERY. 30

**Prophylactic antibiotics for mesh inguinal hernioplasty**

Leigh Neumayer, MD

Jon Thompson, MD

Brock Vair, MD

for the members of the  
Evidence-Based Reviews  
in Surgery Group\*

\*The CAGS Evidence-Based Reviews in Surgery Group comprises Drs. N.N. Baxter, K.J. Brasel, C.J. Brown, P. Chaudhury, T.H. Cogbill, C.S. Cutter, E. Dixon, G.W.N. Fitzgerald, H.J.A. Henteleff, A.W. Kirkpatrick, S. Latosinsky, A. MacLean, T.M. Mastracci, R.S. McLeod, A. Morris, L.A. Neumayer, S. Smith, L.R. Temple and Ms. M.E. McKenzie.

**Correspondence to:**

Ms. Marg McKenzie, RN  
Administrative Coordinator, EBRS  
Mount Sinai Hospital, L3-010  
60 Murray St., PO Box 23  
Toronto ON M5T 3L9  
fax 416 586-5932  
mmckenzie@mtsinai.on.ca

The term “evidence-based medicine” was first coined by Sackett and colleagues as “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients.”<sup>1</sup> The key to practising evidence-based medicine is applying the best current knowledge to decisions in individual patients. Medical knowledge is continually and rapidly expanding. For clinicians to practise evidence-based medicine, they must have the skills to read and interpret the medical literature so that they can determine the validity, reliability, credibility and utility of individual articles. These skills are known as critical appraisal skills, and they require some knowledge of biostatistics, clinical epidemiology, decision analysis and economics, and clinical knowledge.

Evidence-Based Reviews in Surgery (EBRS) is a program jointly sponsored by the Canadian Association of General Surgeons (CAGS) and the American College of Surgeons (ACS) and is supported by an educational grant from ETHICON and ETHICON ENDO-SURGERY, both units of Johnson & Johnson Medical Products, a division of Johnson & Johnson and ETHICON Inc. and ETHICON ENDO-SURGERY Inc., divisions of Johnson & Johnson Inc. The primary objective of EBRS is to help practising surgeons improve their critical appraisal skills. During the academic year, 8 clinical articles are chosen for review and discussion. They are selected for their clinical relevance to general surgeons and because they cover a spectrum of issues important to surgeons, including causation or risk factors for disease, natural history or prognosis of disease, how to quantify disease, diagnostic tests, early diagnosis and the effectiveness of treatment. A methodological article guides the reader in critical appraisal of the clinical article. Methodological and clinical reviews of the article are performed by experts in the relevant areas and posted on the EBRS website, where they are archived indefinitely. In addition, a listserv allows participants to discuss the monthly article. Surgeons who participate in the monthly packages can obtain Royal College of Physicians and Surgeons of Canada Maintenance of Certification credits and/or continuing medical education credits for the current article only by reading the monthly articles, participating in the listserv discussion, reading the methodological and clinical reviews and completing the monthly online evaluation and multiple choice questions.

We hope readers will find EBRS useful in improving their critical appraisal skills and in keeping abreast of new developments in general surgery. Four reviews are published in condensed versions in the *Canadian Journal of Surgery* and 4 are published in the *Journal of the American College of Surgeons*. For further information about EBRS, please refer to the CAGS or ACS websites. Questions and comments can be directed to the program administrator, Marg McKenzie, at mmckenzie@mtsinai.on.ca.

**Reference**

1. Evidence-Based Medicine Working Group. Evidence-based medicine. *JAMA* 1992;268:2420-5.

## SELECTED ARTICLE

Sanabria A, Dominguez LC, Valdivieso E, et al. Prophylactic antibiotics for mesh inguinal hernioplasty. A meta-analysis. *Ann Surg* 2007;245:392–6.

## ABSTRACT

**Objective:** To assess the effectiveness of antibiotic prophylaxis in mesh hernioplasty. **Data source:** Studies were identified by searching databases of Cochrane Hernia Trialists Collaboration, Cochrane Collaboration, MEDLINE, EMBASE and LILACS. **Study selection:** Six randomized controlled trials that evaluated mesh inguinal hernia repair were included. All article selection and data extraction was completed independently by 2 researchers, and conflicts were resolved by consensus. **Outcome measure:** Surgical site infection (SSI). **Results:** A total of 2507 patients were analyzed. The SSI frequency was 1.3% in the antibiotic group compared with 2.89% in the control group (odds ratio 0.48, 95% confidence interval [CI] 0.27–0.85). Statistical heterogeneity was not identified; the number needed to treat was identified as 66 (95% CI 38–258). Sensitivity analysis by quality did not show differences in overall results. **Conclusion:** Antibiotic use in patients with mesh inguinal hernioplasty decreased the rate of SSI by almost 50%.

## COMMENTARY

The objective of this meta-analysis was to assess the effectiveness of antibiotic prophylaxis in mesh (inguinal) hernioplasty. The authors state this both in the abstract and in the introduction. Inguinal hernia repair is one of the most common operations performed in the world, and the use of mesh is currently recommended for repair of all inguinal hernias. Therefore, any change in practice could have an important impact on the overall health of the population as well as cost.

A meta-analysis requires an exhaustive search for relevant studies. The authors performed an exhaustive search of existing databases (e.g., PubMed) but did not mention searching other potential sources for trials such as experts, funding agencies, registration sites (such as clinicaltrials.gov), pharmaceutical companies, device manufacturers, personal files or registries (such as the Swedish hernia registry), nor did they mention whether they examined citation lists of retrieved articles. The authors did not specifically describe their inclusion and exclusion criteria; they only stated they were including studies published since 1985. They excluded 84 trials but did not give specific reasons for the exclusions.

The authors selected 6 randomized clinical trials from

which to perform their meta-analysis. Five of the 6 studies were reported to be blinded; 4 had concealment of the allocation schema from the investigators. The search and data extraction were performed independently by 2 researchers, and the adjudication process is well described. However, the authors did not report any statistic to measure the concurrence of the 2 extractors (e.g., a  $\kappa$  statistic or intraclass correlations).

The results of the individual trials were similar in regards to direction and magnitude in 5 of the 6 studies. The point estimates and confidence intervals (CIs) for the most part overlapped, and the  $Q$  test for heterogeneity as well as the  $I^2$  test for influence of heterogeneity on the odds ratios (ORs) were both nonsignificant. In addition, a sensitivity analysis excluding 1 study because of short follow-up and small sample size did not change the results.

The results show a benefit of antibiotic prophylaxis in lower-risk patients undergoing mesh inguinal hernioplasty. This benefit approaches a 50% relative risk reduction in surgical site infection (OR 0.48, 95% CI 0.27–0.85). The absolute risk reduction was 1.57%, meaning that the number needed to treat to avoid 1 infection is 66. The results are fairly precise even when 1 study was excluded.

The limitations of this meta-analysis are that the authors concentrated on comparing only the main outcome, surgical site infection (SSI), among the studies. They did not consider the other side of the coin, that is, the potential complications of a prophylactic dose of antibiotics. These complications could include allergic reactions and antibiotic-associated diarrhea. Also, the authors did not present any data on the short- or long-term consequences of SSI when undergoing inguinal hernioplasty, therefore one is limited in the ability to fully assess the risks and benefits.

Interestingly, the authors encourage surgeons to evaluate their own SSI rates because if the rate is exceedingly low and/or their patient population is low-risk (as were the patients included in 3 of the 6 studies analyzed), the benefit of prophylaxis may not be as great.

When using this information in an individual practice or patient, surgeons certainly must be aware of their own SSI rates in this procedure and of patient factors that may increase the risk of infection. Whereas a superficial wound infection can usually be treated with opening of the wound and local dressing changes, a deep wound infection requiring removal of mesh results in substantial potential risk for the patient who can end up in a worse condition than before their original repairs. For many surgeons, the risk of a mesh infection, although rare, is enough to subject all patients to 1 dose of prophylactic antibiotics.

**Competing interests:** None declared.