Preoperative steroid use and risk of postoperative complications in patients with inflammatory bowel disease undergoing abdominal surgery

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CRD summary
This review concluded that there was an increased risk of total as well as infectious complications after abdominal surgery with the use of steroids in patients with inflammatory bowel disease. This conclusion was based on the results of a reasonably well-conducted review of non-randomised studies and appears likely to be reliable.

Authors' objectives
To estimate the risk of postoperative complications in patients with inflammatory bowel disease who took corticosteroids at the time of abdominal surgery.

Searching
PubMed, EMBASE, CINAHL, Zetoc and IngentaConnect were searched for dates that ranged from 1965 to October 2006. Search terms were reported. References of selected articles were checked and authors were contacted. Only studies reported in full were eligible for inclusion.

Study selection
Studies that assessed either total or infectious postoperative complications in patients with inflammatory bowel disease who underwent abdominal surgery were eligible for inclusion. Eligible studies compared those treated preoperatively with steroids for at least a month prior to surgery with those not on steroids. Complications were defined as including at least wound infection, sepsis, peritonitis and abdominal abscess. Studies were required to report data sufficient to permit the calculation of an odds ratio (OR). Studies that examined only minimally invasive procedures such as strictureplasty were excluded from the review.

Included studies were conducted in the USA or Europe. Most studies had a retrospective design. Doses of steroids ranged from less than 20mg/day to over 40mg/day. Most studies assessed only patients with Crohn's disease; others assessed patients with ulcerative colitis or a mixed population. No further information on included patients was reported.

The authors stated neither how the papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
Studies were assessed for validity using the Newcastle-Ottawa scale for non-randomised studies. The authors did not state how many reviewers performed the assessment.

Data extraction
Two reviewers independently extracted the data. Disagreements were resolved through discussion. Unadjusted odds ratios with 95% confidence intervals (CI) were calculated. The degree of confounding by uncontrolled variables was estimated where possible with data from a paper that provided both adjusted and unadjusted odds ratios. Where possible, data were extracted on subgroups of patients who took different doses of corticosteroids.

Methods of synthesis
A Mantel-Haenszel fixed-effect model meta-analysis was used to calculate pooled odds ratios with 95% CIs for postoperative complications. Also, a random-effects analysis was performed. Statistical heterogeneity was assessed using Cochran's Q and the I² statistic. Sensitivity analyses were used to explore the effect of including only studies scoring at least 7 points on the validity assessment and of excluding each individual study from the analysis. Publication bias was assessed using Egger's regression test.
Results of the review
Eleven studies (n=at least 2,976) were included in the review: nine were retrospective (n=at least 2,778) and two were prospective (n=198). It was not possible to be certain of patient numbers as two studies reported the number of operations rather than number of patients. Newcastle-Ottawa scores ranged from 5 to 8 out of a possible 9. Follow-up was for 30 days postoperatively or for duration of hospital stay.

The total risk of postoperative complications was statistically significantly higher in patients taking corticosteroids (OR 1.41, 95% CI 1.07 to 1.87; seven studies), as was the risk of infectious postoperative complications (OR 1.68, 95% CI 1.24 to 2.28). The results were not significantly different when a random-effects model was used. An adjusted analysis that took into account the effect of confounding variables was performed for infectious complications. Adjustment by a factor of 0.9 gave an adjusted odds ratio of 1.79 (95% CI 1.32 to 2.43). There was no evidence of statistically significant heterogeneity for either analysis. Sensitivity analyses that included only studies that scored at least 7 points on the Newcastle-Ottawa scale did not materially alter the results.

There was no statistically significant difference between patients who took doses higher than 20mg/day and those who took lower doses for total complications (OR 1.35, 95% CI 0.93 to 1.97; three studies) or in infectious complications (OR 1.17, 95% CI 0.73 to 1.87; two studies). There was a statistically significantly higher rate of total complications in patients who took more than 40mg/day compared with those who took lower doses (OR 2.04, 95% CI 1.28 to 3.26; two studies); this difference was also apparent for infectious complications (OR 9.16, 95% CI 1.51 to 55.42; one study).

There was no evidence of publication bias.

Authors' conclusions
There was an increased risk of total and infectious complications after abdominal surgery with the use of steroids in patients with inflammatory bowel disease.

CRD commentary
The review question and inclusion criteria were clear. The authors searched a number of relevant databases and other sources; they excluded studies not published in full, which can increase the risk of publication bias, but this was assessed and no evidence for it was found. The authors reported that they used methods designed to reduce reviewer bias and error in the extraction of data, but not in the selection of studies or the assessment of validity. The validity assessment used an assessment scale appropriate to the non-randomised studies included in the review. Included studies were of reasonable quality, although only limited information was reported on the patient populations. The decision to employ meta-analysis appeared reasonable. Appropriate assessment and exploration of potential sources of heterogeneity were undertaken. The authors' conclusions accurately reflected the results of the review and, although based on non-randomised evidence, they appear likely to be reliable.

Implications of the review for practice and research
Practice: The authors stated that it may be prudent to stop corticosteroid treatment preoperatively where possible, or to taper doses to lower than 40mg/day.

Research: The authors stated that a prospective multicentre observational study of the impact of preoperative corticosteroid treatment on complications following abdominal surgery in patients with inflammatory bowel disease and that accounted for confounding factors would be valuable. More studies were also required to evaluate the risk of postoperative infectious complications associated with biologic agents.

Funding
National Post Doctoral Award from the Department of Health (UK).

Bibliographic details
PubMed ID
18616660

DOI
10.1111/j.1572-0241.2008.01942.x

Original Paper URL
http://www.nature.com/ajg/journal/v103/n9/abs/ajg2008473a.html

Indexing Status
Subject indexing assigned by NLM

MeSH
Abdomen /surgery; Humans; Inflammatory Bowel Diseases /complications /drug therapy; Postoperative Complications; Risk; Steroids /adverse effects

Accession Number
12009100795

Date bibliographic record published
31/03/2009

Date abstract record published
17/02/2010

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.