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Corticosteroids for the resolution of malignant bowel obstruction in advanced gynaecological and gastrointestinal cancer (Review)

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[Intervention Review]

Corticosteroids for the resolution of malignant bowel obstruction in advanced gynaecological and gastrointestinal cancer

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ABSTRACT

Background

This is an update of the review published in Issue 3, 1999. Gastrointestinal and ovarian cancers are common cancers. The incidence of associated malignant bowel obstruction in patients with advanced cancers of these types is not known, and the best management of these patients is controversial. Inappropriate management may result in uncontrolled (faeculent) vomiting, pain and distress. Management of the symptoms can include palliative surgery, nasogastric tube suction together with intravenous fluids, or pharmacological means, such as corticosteroids. There is uncertainty regarding both the efficacy and possible harmful effects of corticosteroids, and also the most effective type, dose/dosing regime, route and period of administration.

Objectives

To locate, appraise and summarise evidence from scientific studies on intestinal obstruction due to advanced gynaecological and gastrointestinal cancer, in order to assess efficacy of corticosteroids.

Search methods

A comprehensive list of all studies was provided by an extensive search of the electronic databases, relevant journals, reference lists, the grey literature, contact with investigators and other search strategies outlined in the methods. Date of last search conducted in February 2006.

Selection criteria

As the review concentrates on the 'best evidence' available of the role of corticosteroids in malignant bowel obstruction due to advanced gynaecological and gastrointestinal cancer the inclusion criteria were kept fairly broad so as to include all studies relevant to the question.

Data collection and analysis

Data extraction forms were used to collect data from the studies included in the review. The data was checked by a secondary searcher to reduce error.

A qualitative analysis was performed of the dichotomous data of resolution of obstruction and death at one month, obtained from the randomised controlled trials of corticosteroids versus placebo. Both fixed and random effect models were used. Number-needed-to-treat-to-benefit (NNT) was derived from the odds ratio. Kaplan-Meier survival curves from individual patient data were also analysed. Studies of lower methodological quality were assessed in a qualitative manner.

Main results

No new included or excluded trials were found for this update beyond the three unpublished, randomised, placebo, double blind controlled trials and seven published (prospective and retrospective) trials which were previously considered eligible.

Using only the randomised trials (89 patients), there is a trend, which is not statistically significant, for the resolution of bowel obstruction using corticosteroids. There is no statistically significant difference in mortality at one month, nor in the Kaplan-Meier curves, which describe the survival of patients on corticosteroids or placebo. Number needed to treat is six (three, infinity) i.e. six patients need to be treated with corticosteroids to resolve one episode of bowel obstruction. The results are robust to fixed and random effects models and to 'best' and 'worst case' scenarios on the missing data from patients. The morbidity associated with corticosteroids appears to be very low, though the quality of the data limits this conclusion. No other outcomes were available from the published data or from the authors.

Authors' conclusions

There is a trend for evidence that corticosteroids of dose range six to 16 mg dexamethasone given intravenously may bring about the resolution of bowel obstruction. Equally, the incidence of side effects in all the included studies is extremely low. Corticosteroids do not seem to affect the length of survival of these patients. Since the last version of this review, no new studies have been conducted. No new studies have been identified for this update and the conclusions are not altered.

PLAIN LANGUAGE SUMMARY

Corticosteroids for the resolution of malignant bowel obstruction in advanced gynaecological and gastrointestinal cancer

Corticosteroids may reduce bowel obstruction for people with advanced gastrointestinal or ovarian cancer. Malignant bowel obstruction is fairly common in people with gastrointestinal (gut) cancer or ovarian cancer. It can lead to pain, vomiting, nausea, or complete constipation. Corticosteroids may lower inflammation and so help to reduce the obstruction especially if surgery is not considered to be suitable. The review found that corticosteroids may reduce bowel obstruction for people with these cancers, with a low rate of adverse effects. The treatment does not appear to affect survival rates compared to the placebo.

BACKGROUND

This review is an update of the same previously published review in The Cochrane Database of Systematic Reviews (Issue 3, 1999). Gastrointestinal and ovarian cancers are common cancers with gastrointestinal being the most common overall (with an incidence of 112/100,000) and ovarian the fourth most common cancer in women (with an incidence of 17/100,000) within the United Kingdom. Up to 26,000 men and women and 4000 women a year respectively die from these diseases. Other gynaecological cancers cause the death of a further 2300 women each year (CRC 1995).

The incidence of malignant intestinal obstruction in these groups of patients is generally not known. Many retrospective studies have estimated that this can occur in five to 51% of patients with gynaecological malignancies (Rose 1978; Dvoretzky 1988a; Dvoretzky 1988b; Ripamonti 1993) and in ten to 28% of patients with gastrointestinal cancer (Ripamonti 1993). These figures, however, are in highly selected groups of patients, and different diagnostic criteria are often used. The true incidence may be even higher.

Management of bowel obstruction

Prior to a seminal paper by Baines 1985, treatment for bowel obstruction due to malignancy was either palliative surgery or, if surgery was not possible, nasogastric tube suction together with intravenous fluids. Both methods meant that the patient remained in hospital, often for prolonged periods of time, with their symptoms inadequately addressed. Baines *et al.* (Baines 1985) demonstrated, however, that the symptoms of bowel obstruction in those patients where surgery was not possible could be managed by pharmacological means. In such patients they demonstrated an improvement in generalised abdominal pain, colic, nausea and vomiting by using regular analgesics, anti-spasmodics, and anti-emetics. Since this study, others have produced similar results in different settings but often using different medication.

On admission to hospital initial management is to resuscitate the patient using intravenous fluids and electrolytes and keeping them 'nil by mouth' to reduce vomiting. Analgesics and antiemetics are used to a varying extent in the hospital setting but are used more widely within the hospice and palliative care population. Nasogastric intubation, occasionally with continuous suction, is commonly performed within hospital with the aim of decompressing the stomach and reducing the risk of vomiting (Butler 1991). This conservative management of 'resting the bowel' can continue for three to nine days, if not longer, depending on the institution and it is estimated that between 12 to 29% of symptoms may resolve. Unfortunately, it is thought that symptoms recur in 32 to 45% of patients (Butler 1991; Osteen 1980). The patients in whom symptoms are not managed, or inadequately addressed may deteriorate with uncontrolled (faeculent) vomiting, pain and distress and will eventually die in this most distressing fashion.

Role and use of corticosteroids

The possible role of corticosteroids in bowel obstruction is complex and not completely known. Corticosteroids act as both anti-emetics (Allan 1993) and co-analgesics (Twycross 1994) and so may be able to palliate the symptoms of nausea, vomiting and pain in bowel obstruction. It is also thought that, in addition, the anti-inflammatory activity of corticosteroids may reduce peri-tumour

inflammatory oedema associated with a malignant lesion thereby helping to resolve the obstruction and leading to consequent symptom relief (Ripamonti 1994).

Small groups of patients have been reported as benefiting from corticosteroids but these reports are not within the context of randomised controlled trials (Fainsinger 1993; Ripamonti 1994). The problem remains that bowel obstruction is a dynamic process, and symptoms may improve spontaneously over days. The decision to use corticosteroids will often reflect the personal preference of the physician and the institution in which they work.

Corticosteroids are often given for short periods of time especially when the patient first presents, often with an initial loading dose and then reduced in as short a period of time as possible to stop. This is done in order to limit the known side effects which include oral candidiasis, proximal weakness, cushingoid habitus (Hardy 1997), gastric irritation and predisposition to haemorrhage and perforation (Ellershaw 1994) (especially in an already-compromised bowel). The route of administration varies; many reports include oral, intravenous and subcutaneous as well as rectal administration.

Whatever the mechanism there remains no information in the literature within the context of a systematic review discussing whether corticosteroids are able to resolve intestinal obstruction and so improve the symptoms, and if so, the most effective type, dose or dosing regime, route of administration, or for what period of time these agents should be given.

Like many treatments for rare diseases, bowel obstruction is managed and treated empirically by offering an initial trial, sometimes with a loading dose, continuing treatment for as long as possible in those patients that seem to respond. The best management of this group of patients is controversial. There is uncertainty regarding both benefits and possible harmful effects of corticosteroids, and there are marked variations in clinical practice.

Rationale of a systematic review

In a patient with progressive cancer where there is no 'curative intent', the aim of all treatment is to improve the patient's quality of life, considering all available and appropriate means.

Currently, patients with bowel obstruction remain in hospital for long periods of time due to uncertainty in both the diagnosis and management strategies, especially so if the patient remains symptomatic. The cost of numerous trials of unsuccessful medications and increased medical and nursing input is significant, as is the emotional distress to the carers and family. If appropriate symptom management is instigated rapidly, a patient's symptoms can be controlled satisfactorily, and discharge home with appropriate care is facilitated. Provision of further palliative care services can then take place in the home or hospice environment.

The ability of individual clinicians to appraise all the available clinical evidence would mean potential cost benefits and efficiency gains with:

1. improved symptom control management and better quality of life for patients;
2. improved standard management;

3. shorter stay in hospital, with more appropriate use of resources.

OBJECTIVES

This was a re-visit of the literature and the original primary objective of this systematic review was to systematically evaluate all known trials of corticosteroids in any language, published or unpublished, to determine their efficacy in the treatment of bowel obstruction caused by gastrointestinal or gynaecological cancer. A secondary aim was to investigate the sources of heterogeneity which may influence the outcomes, and whether they are important in the interpretation of results and overall conclusions reached.

Potential causes of heterogeneity include previous treatments of chemotherapy and surgery, previous steroid use (including type and dose of steroids used) and whether the 'amount' of disease is important.

With regard to clinical efficacy of corticosteroids, the specific objectives were:

1. primary outcome - to assess the effects of corticosteroids on the clinical resolution of bowel obstruction within ten days of presentation of symptoms;
2. secondary outcomes:
 - a) to determine whether corticosteroids were effective in the resolution of symptoms of:
 - i. pain
 - ii. nausea
 - iii. vomiting
 - b) to determine whether corticosteroids reduce further episodes of bowel obstruction;
 - c) to determine whether corticosteroids increase or decrease mortality;
 - d) to determine whether corticosteroids increase or decrease morbidity;
 - e) to determine whether corticosteroids affect quality of life.

METHODS

Criteria for considering studies for this review

Types of studies

The systematic review included studies that met the following criteria:

- randomised controlled trials (RCTs). Randomisation was defined as studies which are described by the author(s) as randomised anywhere in the manuscript;
- cohort studies where the comparability of cohorts has been established or existing confounding factors adjusted for (these may be prospective with historical controls, or retrospective with concurrent controls);
- well designed case-control retrospective studies where evidence is shown that selection bias and confounding variables has been addressed or considered;
- longitudinal surveys or case histories;
- studies published in any language were included. All identified trials, published and unpublished, were eligible;
- conclusions from the non-randomised, non-controlled data were drawn if there was insufficient evidence from randomised

controlled trials, and the quality and validity of the study had been established.

Types of participants

All patients of any age with a clinical diagnosis of intestinal obstruction due to advanced gynaecological and gastrointestinal cancer. Both inpatients and outpatients were included, in any setting, e.g. home, hospice, district general hospital, oncology centre.

Types of interventions

Studies which included any trial of corticosteroids (at any dose, frequency, duration or method of administration) were considered. Although ideally randomised placebo controlled trials provide the most reliable evidence, all available trials, even without placebo, were considered as 'best evidence available'.

Types of outcome measures

Where these outcome measures were not included in the study under consideration, contact was made with the individual author(s) to establish whether there are data on these outcomes and if it could be supplied. Further information about the stage and type of disease, number of patients studied, drug type, dosing regime, study design, study duration and follow up, withdrawals and adverse effects (minor and major) were also taken from each report.

Outcome measures were not entry criteria for this review.

Primary outcomes

Clinical resolution of bowel obstruction within ten days of presentation of symptoms

Secondary outcomes

- a) time to resolution of symptoms of pain, nausea and vomiting,
- b) reduction in further episodes of bowel obstruction,
- c) mortality,
- d) morbidity,
- e) quality of life scores.

Search methods for identification of studies

Electronic searches

In order to be as comprehensive as possible the search strategies were employed to identify all relevant studies irrespective of language. Studies pre-dating 1966 were not searched for. Please see [Appendix 1](#) for the MEDLINE search strategy and [Appendix 2](#) for other search strategies. Attempts were made to obtain full text translations of all relevant non-English articles.

- a) MEDLINE - on Ovid (previous search used Silver platter). Searched from 1966 to 9 to February 2006.
- b) EMBASE - on Ovid Searched from 1980 to 12 to February 2006. Two overlapping searches were combined, as for MEDLINE, and the searches were developed as for MEDLINE - See [Appendix 2](#).
- c) CancerCD - on Silver Platter. Searched from 1980 to 12 to 1997. Two overlapping searches were combined as for Medline. The searches were developed using only free text terms.
- d) The Cochrane Database Controlled Trials Register (CENTRAL/CCTR *The Cochrane Library* 2006, Issue 1). This was searched using

only one subject, i.e. 'obstruction', using both MeSH terms and text terms. See additional tables for search used

e) Science Citation Index on BIDS ISI from 1991 to 12 to 1997. Two overlapping searches were combined as for MEDLINE and developed using only free text terms.

f) CINAHL - on Silver Platter. Searched from 1982 to 12 to 1997. Two overlapping searches were combined as for MEDLINE. The searches were developed as for MEDLINE.

Grey literature - Electronic searches

a) Dissertation Abstracts - on Silver Platter, 1961 to 11 to 1997. This was searched using only one subject, i.e. 'obstruction', using free text terms.

b) SIGLE - via Blaze Line British Library - 1997. This was searched as for Dissertation Abstracts.

c) Index to Scientific and Technical Proceedings - on BIDS ISI, from 1982 to 2 to 1998. This was searched as for Dissertation Abstracts.

d) Boston Spa Conferences - via Blaze Line British Library Current Edition. This was searched as for Dissertation Abstracts.

e) Inside Conferences - via Blaze Line British Library Current Edition 1996 to 1997. This was searched as for Dissertation Abstracts.

f) National Health Service National Research Registry - via CD-ROM August 1997. This was searched using MeSH terms and free text terms as for CENTRAL/CCTR.

Searching other resources

Hand searching

Using information from the above searches the journals most likely to include trials were identified, and after discussion with the content experts the following publications were searched:

a) Journals

- Palliative Medicine - from inception (January 1987) to 1997;
- Journal of Pain and Symptom Management - from inception (Winter 1986) to 1997;
- Gynecologic Oncology - from January 1993 (48,1) to 1997;
- The Hospice Journal - from inception (Spring 1985) to 1997;
- Journal of Palliative Care - from inception (September 1985) to 1997.

b) Bibliographic databases

- Progress in Palliative Care - from inception (October 1993) to 1997;
- Terminal Care Index- via the British Library Health Care Information Service from inception (July 1988) to December 1990 and then continued as Palliative Care Index from January 1991 to 1997.

c) Conference proceedings

The following conference proceedings were searched for relevant abstracts:

- European Congress on Palliative Care, Number IV and Number V;
- The American Society of Clinical Oncology (ASCO) 1990 to 1997;
- The European Cancer Conference (ECCO) 1990 to 1997.

d) Reference searching

Using chapters from standard textbooks on malignant bowel obstruction, reference lists were searched:

- The Oxford Textbook of Palliative Medicine (Baines 1998);
- Cancer. Principles and Practice of Oncology (Ozols 1997);
- Symptom Management in Advanced Cancer (Twycross 1997).

Further references were searched from the primary reports and any reviews found.

Science citation index

Each included study was also found on the Science Citation Index and followed up for future studies.

RCT registries and ongoing trials

The following organisations were contacted for information about ongoing trials:

- National Cancer Institute of America;
- United Kingdom Co-ordinating Committee on Cancer Research;
- The National Clinical Trials Registry of Australia: Cancer Trials;
- French Cancer Clinical Trials Registry.

Personal contact

a) Contact with every member of the Association for Palliative Medicine (651 members) was made by letter asking for information, particularly unpublished work or research in progress.

b) Contact by letter with 26 international associations of palliative medicine (obtained via the Hospice Information Centre at St Christopher's Hospice). A covering letter was sent asking them to mail-list their members using a standard letter which was also enclosed.

c) Contact with 12 acknowledged experts i.e. those authors who had previously published extensively in the palliative medicine literature or who are active in palliative care research.

d) Contact with the 18 major gynaecological oncology units as specified by the Royal College of Obstetricians and Gynaecologists.

e) Contact with the 30 members of the London Group of Medical Oncologists and Radiotherapists.

f) Contact with individual authors of the studies found.

g) Meeting with Dr Baines (author of seminal paper), discussing use of steroids, and in order to obtain unpublished data.

h) Letters published in Palliative Medicine and Progress in Palliative Medicine, explaining study and requesting information.

i) Contact with editor of Palliative Medicine to discuss if he was aware of any unpublished papers or reports.

j) Contact with Cochrane Review Groups: Colorectal Cancer Group and Gynaecological Cancer Group.

k) Contact and discussion with librarian at Halley Stewart Library at St Christopher's Hospice and use of in-house library database.

World wide web

The following Web sites were visited and searched using text words:

- Doctors' Guide to the Internet;
- Health on the Net Foundation;
- Cancer News on the Net;
- NCI Cancer Net Info.

Data collection and analysis

All records from each of the databases above was imported to the bibliographic package Reference Manager and merged into

one core database where all titles, keywords and abstracts were inspected for relevance. Full text was obtained of all relevant articles. Where it was not possible to classify an article and reject it with certainty the full text of the article was obtained for further evaluation. A final list of potentially relevant articles was therefore created in Reference Manager.

This group of studies was assessed independently by two review authors (to increase validity) (Chalmers 1987) to the above inclusion criteria to judge which articles were to be included in the review. The reports were masked to journal publication, date, authorship and institution so as to produce more consistent results. Where differences occurred they were resolved by consensus and, when necessary, in consultation with a third review author. Agreement on which studies to include was measured by the kappa statistic to analyse the extent of inter-reviewer agreement. Justification for excluding studies was documented at this stage.

Data abstraction

A data abstraction form was specifically designed for the review. The following data items were abstracted independently by the two review authors masked with respect to journal publication, date, authorship and institution (so as to produce more consistent scores) (Chalmers 1987; Jadad 1996).

1. Trial quality characteristics.
2. Participants: number of subjects at baseline, gender, mean age.
3. Interventions: Amount and type of corticosteroid and administration route.
4. Outcome data.
5. Potential confounding factors: any assessment of previous treatment.

The evaluation of methodological quality of the trials included is as described in the Cochrane Collaboration Handbook. Each randomised controlled trial was rated according to the quality of allocation concealment categories.

Category A: adequate concealment

Category B: uncertain, indication of adequate

Category C: inadequate concealment

Category D: not used

As this review concentrates on the 'best evidence', the quality of all the research found was graded using the criteria used by the NHS Executive in their Reviews on Commissioning Cancer Services (Mann 1996). Using the concept of a hierarchy of evidence, whereby some research methodologies are accepted as more robust than others, conclusions can be reached with more weight being given to well-conducted, controlled studies.

The quality of the research was graded using the following criteria:

Grade I (Strong evidence)

Randomised controlled trial (RCT) or review of randomised controlled trials

IA: calculation of sample size and accurate and standard definition of outcome variables,

IB: accurate and standard definition of outcome variables,

IC: none of the above.

Grade II (Fairly strong evidence)

Prospective study with a comparison group (non-randomised controlled trial or good observation study)

IIA: calculation of sample size and accurate, standard definition of outcome variables and adjustment for the effects of important confounding variables,

IIB: one of the above,

IIC: none of the above.

Grade III (Weak evidence)

Retrospective study

IIIA: comparison group, calculation of sample size and accurate and standard definition of outcome variables,

IIIB: two of the above criteria,

IIC: none of the above.

Grade IV (Weak evidence)

Cross-sectional study

These grades broadly correspond with the Clinical Outcomes of Group Categories of Evidence for use in clinical practice guidelines, where I = A, II or III = B, IV = C.

Differences in data extraction were resolved by referring back to the original article and utilizing consensus between the two review authors. Where necessary information was sought from the authors of the primary study for clarification or missing information.

Dichotomous data (i.e. resolution of bowel obstruction) was expressed as an odds ratio, and a common odds ratio was calculated with a number needed to treat being derived to help clarify the degree of benefit, and the uncertainty in each treatment was expressed using 95% confidence intervals. Continuous data (i.e. symptom scores) if present would have been converted to the weighted mean difference and an overall weighted mean difference would have been calculated and their standard errors.

Evidence of heterogeneity was sought between the relevant studies. If heterogeneity was demonstrated, the effect of differences in users, settings and primary and secondary outcome measures would have been explored. The Cochrane Review Manager software RevMan was used for estimation of overall treatment effects/meta-analysis of results. Both fixed and random effects models were used to calculate a weighted average of the treatment effects across the studies under review.

Sensitivity analyses as well as including study quality (quality of allocation concealment) would have included year of publication, type of outcome measure and random and fixed effects models if appropriate. Publication bias would have been tested for using funnel plots and by formal tests of heterogeneity if relevant.

RESULTS

Description of studies

This is an update of the review and no new trials were found beyond those already searched on the initial review.

Two unpublished reports containing three randomised, placebo, double blind controlled trials (a total of 89 patients) were obtained (Hardy 1997a; Hardy 1997b; Laval 1998) by personal contact via the Association of Palliative Medicine and International Organisations

of Palliative Medicines respectively. Seven retrospective and prospective reports were also located, (two reports via Medline, one report via Embase, two reports via hand searching and two reports via personal contact).

Details of these eligible reports are in the 'Characteristics of included studies'. Further information was requested from the authors of the unpublished randomised trials on the patients that dropped out or were lost to follow up and individual patient mortality data. Further data were obtained from both sets of authors.

Risk of bias in included studies

All the randomised trials were double-blind, placebo controlled with allocation concealment of A. The quality scores (from the NHS criteria) for all the individual trials are reported in the notes section of 'Characteristics of included studies' table.

There was full agreement after discussion between the two review authors as to the data extracted and the methodological quality of the papers. We found no need to involve a third review author.

Effects of interventions

This search for this review was updated in February 2006 and no new included or excluded trials were found, however, the results presented and identified in the original review still stand as follows:

There was full agreement after discussion between the two review authors as to the articles to be included, the data extracted and the methodological quality of the papers. We found no need to involve a third review author.

Heterogeneity: clinical aspects

The three unpublished randomised controlled trials had similar entry criteria in terms of population, intervention and outcome measures, and were able to be combined in a meta-analysis.

[Hardy 1997b](#) had slightly more liberal entry criteria in that the patients could already have been on intravenous fluids, and those patients with previous episodes of obstruction were also allowed entry. It was also the smallest study in terms of size. [Hardy \(Hardy 1997a; Hardy 1997b\)](#) stratified the patients into those who had recently received chemotherapy and those who had not. [Laval 1998](#) did not do this analysis. However, [Laval 1998](#) used two different doses of corticosteroids but the analysis was only carried out as corticosteroids (on any dose) versus placebo.

Methodological aspects

All the randomised trials were double-blind, placebo controlled with allocation concealment of A.

Statistical aspects

On inspection of the individual results, even though the point estimate of [Hardy 1997b](#) was to the right of the line of no effect, the 95% confidence interval was extremely wide and the overall point estimates combined crossed all three lines. Using a formal test of statistical heterogeneity and the random effects model, the chi-squared result is 2.32, with two degrees of freedom. This is not significant at a 10% significance level (4.61). It must be remembered, however, that this is a test of low power using only three trials, and it is still possible that important differences

between the studies are present. In view of the above, a random effects model was used to combine the results.

Due to the small number of trials, investigation of heterogeneity using meta-regression and subgroup analysis was not statistically appropriate. Equally, as all the randomised trials found were unpublished, it was not appropriate to perform a funnel plot.

Primary outcomes

The results of the meta-analysis for the three randomised controlled trials using the random effects model for the resolution of bowel obstruction using corticosteroids are demonstrated in meta-view. Using a random effects model, there is a point estimate of 0.51 (95% confidence intervals 0.19, 1.43). This is using all the available data which was extracted either from the papers or via the authors. Similar results are obtained in the same direction using a fixed effect model with similar 95% confidence intervals 0.49 (0.20, 1.25).

Secondary outcomes

The results of the random effects meta-analysis for the three trials demonstrated that there is no evidence that corticosteroids have any effect on mortality at one month. There is no statistically significant difference between the Kaplan-Meier survival curves that compare survival since obstruction for corticosteroids and placebo (available on request from authors).

There were no data available on the resolution of symptoms, or data concerning further episodes of bowel obstruction nor quality of life.

Sensitivity analysis

Sensitivity analysis was also carried out using the available data supplied, and then using the 'lost to follow up' or 'missing data' by assuming either the best possible or worst possible scenario. One patient from [Hardy 1997a](#) (1/25), one from [Hardy 1997b](#) (1/14) and six patients from [Laval 1998](#) (58 randomised, 52 results obtained) fitted this situation. There were six drop-outs/exclusions from the [Laval 1998](#) study and even though an explanation was supplied (three died, one had a nasogastric tube inserted whilst in the trial, one patient had a different amount of corticosteroid given and one patient was randomised having already entered into the trial seven months earlier) no data were received about eventual outcomes.

The sensitivity analysis using a random effects model showed similar point estimates, though with smaller confidence intervals (95%); best scenario 0.50 (0.21, 1.2) and worst scenario 0.60 (0.21, 1.75).

Number needed to treat

The number needed to treat (as derived from the odds ratio using all the available data) is six (95% confidence intervals: three, infinity) - that is, six patients need to be treated with corticosteroids to resolve one episode of bowel obstruction. Using different probabilities for the numbers that spontaneously resolve from 33 to 66% does not change the final answer.

Morbidity data

From the morbidity data described in [Hardy \(Hardy 1997a; Hardy 1997b\)](#) it was not possible to distinguish morbidity due to the drug as opposed to the underlying condition. No data were

supplied comparing placebo to the treatment group. Two drop-outs did, however, occur; in [Hardy 1997a](#) one patient suffered a pulmonary embolus on Day three, and in [Hardy 1997b](#) one patient was withdrawn on Day two due to severe epigastric pain. This patient was on dexamethasone. The only definite side effect mentioned was, "some patients complained of an unpleasant perianal sensation" on receiving dexamethasone, which is a known side effect of this drug.

Other reports

Seven other studies of lower methodological quality were found. They were all graded IIC apart from one, which was IIC. The majority of the reports looked at the prescription of corticosteroids together with all other therapeutic modalities in unselected, uncontrolled groups of patients with bowel obstruction and it is therefore not possible to attribute resolution of obstruction or symptoms to the intervention.

DISCUSSION

All three randomised controlled trials were of good methodological quality, and in assessing the resolution of bowel obstruction (an inexact and soft clinical end point), all studies used blinded assessors which was important to limit bias. This updated review does not provide additional information on this treatment as no new relevant studies were included.

The strength of the results was also robust in terms of the statistical methods used (fixed or random effects) and the use of those patients who dropped out or were lost to follow up.

There is a trend for improvement in bowel obstruction for patients treated with corticosteroids; the line of no effect is crossed, however, and therefore this result is not statistically significant at a 95% level.

There was no evidence of any effect of corticosteroids on mortality at one month. Even though in some patients corticosteroids help bring about resolution of the obstruction it must be presumed that the corticosteroids do not act as an 'anti-cancer agent' and the patients deteriorate and die as a consequence of the volume of disease and associated metabolic and catabolic abnormalities that occur in all these patients.

Clearly, with the results that are available at present, more trials need to be performed. Problems, however, need to be overcome. The [Hardy 1997a](#)) trial was commenced in September 1987 and 25 patients were recruited in 36 months. [Hardy 1997b](#) was commenced in January 1993, and 14 patients were recruited in 24 months. This study was terminated early due to non-recruitment. [Laval 1998](#) recruited 58 patients in 29 months from 35 separate institutions. This clearly demonstrates the difficulty of undertaking studies in this population of patients.

Both [Hardy 1997a](#) and [Laval 1998](#) demonstrated very similar results in terms of direction and amount, though [Hardy 1997b](#) was in the opposite direction (with extremely wide confidence intervals). This could be due to chance, the small numbers in the trial, or due to changes in the entry criteria. The patients were allowed to have had previous obstructive episodes treated by steroids and to be on intravenous fluids. It may be that this group of patients who, by definition, may have previously been in obstruction and who responded to therapy (because they had all gone into the trial)

were more unwell with more extensive disease and therefore less likely to respond. Unfortunately there were no data available on individual patients as to whether they had had previous episodes of obstruction and whether steroids had been prescribed or not.

Other studies

Two studies ([Farr 1990](#); [Philip 1998](#)) specifically looked at the use of corticosteroids in bowel obstruction but these were of poor methodological quality with no objective criteria being used to grade symptoms. It was unclear whether a decrease in the symptoms (which did occur) in [Farr 1990](#) and resolution of bowel obstruction were synonymous, as is suggested in this article. [Philip 1998](#) also states that gastrointestinal function was definitely restored in 5/13 (38%) of patients and possibly in another 4/13 (31%) but in the absence of any control group this may reflect the natural history of the disease with spontaneous resolution of function. (In the randomised controlled trials of [Hardy 1997a](#); [Hardy 1997b](#) and [Laval 1998](#) spontaneous resolution occurred in 50, 60 and 33% respectively in the placebo-treated groups). Of interest in the paper by [Farr 1990](#) is the fact that all the patients who were prescribed steroids, in their retrospective audit of 145 patients in total, had a low rate of side effects reported. This is also in agreement with all other retrospective studies.

AUTHORS' CONCLUSIONS

Implications for practice

No further evidence was identified through the re-running of this search strategy and therefore the following implications for practice still stand.

Using the meta-analysis results there is a trend for evidence that corticosteroids of dose range six to 16 mg dexamethasone given intravenously may bring about the resolution of bowel obstruction. Equally, the incidence of side effects in all the included studies is extremely low. The corticosteroids do not seem to affect length of survival but may palliate the symptoms extremely well and may enable the multidisciplinary team looking after the patient to address further issues regarding placement or treatment. The length of the therapeutic trial period is unknown, but it would seem sensible that if response has not been seen within four or five days, it is unlikely to work and it would seem reasonable to stop.

Corticosteroids are an inexpensive intervention, easily administered by medical or nursing staff, which means that the patient can be treated in any environment (home, hospice or hospital) without difficulty. This is of obvious importance in many different countries, where large distances exist between the patient, who may be extremely symptomatic and unwell and therefore unable to travel, and the hospital centre. Equally, carers may be able to learn how to inject subcutaneously if required, depending on the locality and distance of the nearest medical/nursing staff. The common side effects that do occur, such as prophylaxis against ulcers and mouth care, can also be looked for and treated appropriately.

Implications for research

No further trials have been conducted since the first publication of this review and therefore the original implications for research still stand.

In view of the overall results and the confidence intervals more research is still needed and should be focused on patient recruitment in trials in order to elicit a more precise result. It is presumed that by causing the resolution of bowel obstruction, corticosteroids also improve the symptoms and therefore 'quality of life' but this needs to be confirmed. Further trials should include quality of life measures as a primary outcome measure. Further controlled trials on the most effective type of corticosteroid, dose or dosing regime, route of administration, or to identify the period of time these agents should be given, also need to be performed. Further data also need to be collected prospectively on morbidity associated with corticosteroids, as undoubtedly the patients that live for a longer period of time (as seen from the survival curves)

may begin to experience the significant side effects associated with high dosage of corticosteroids, even if only used for short periods of time.

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CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Baines 1997

Methods	Prospective uncontrolled study
Participants	18 patients in bowel obstruction. 15/18 patients with Gynae/GI cancer. Hospice
Interventions	10/15 patients had steroids. 5/15 no steroids. Dexamethasone 6-8 mg/day (n = 8) (sc) and predsol 15 to 60 mg/day (n = 2) (pr).
Outcomes	No validated scores. 4/10 improved symptomatically (including one bowel obstruction resolved) on steroids. 6/10 no improvement on steroids. 4/5 patients difficult control of vomiting on no steroids.
Notes	Grade IIC. Patients who were more 'unwell' not given steroids. One patient had Ulcerative Colitis and improvement seen. Side Effects: one gastric haemorrhage on dexamethasone

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	D - Not used

Bruera 1996

Methods	Retrospective study of 100 consecutive patients admitted to unit 1992 to 1993. Symptom scores assessed prospectively.
Participants	Patients with bowel obstruction (n = 18) not looked at separately. 26/100 patients with Gynae/GI cancer. Hospice
Interventions	Dexamethasone (dose unknown) (o,sc).
Outcomes	VAS for appetite, nausea, pain, activity score, sensation of well being - categorical scale for relief of nausea and vomiting from notes
Notes	Grade IIIC. Not clear what patients with bowel obstruction given as not primary function of study - results not separated according to disease, therefore not able to analyse results for bowel obstruction due to Gynae or GI cancer

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	D - Not used

Fainsinger 1994

Methods	Retrospective study of 100 patients who died in unit between 12/1990 to 11/1991.
Participants	15 patients with bowel obstruction. 80% (12/15) patients with Gynae/GI cancer. Hospice
Interventions	Dexamethasone 8-60 mg/24 hours (sc), median dose 40 mg given to all patients.
Outcomes	VAS for pain, nausea, drowsiness, completed by nurse, patient, family. 13/15 patients had obstructive symptoms on admission
Notes	Grade IIIC. Individual outcomes for 15 patients given. Not clear length of time on steroids, amount of steroids, results due to steroids. Many different drugs assessed at the same time. Side Effects: All patients developed oral candida.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	D - Not used

Farr 1990

Methods	Retrospective study of patients admitted to unit over five years 1981 to 1986
Participants	Nine patients in bowel obstruction. 8/9 patients with Gynae/GI cancer. Hospice
Interventions	Im/iv solu-medrol 90 mg 8 hourly for 6-9 doses then oral prednisolone 10 mg 8 hourly
Outcomes	No validated scores. 6/9 symptomatic improvement. Marked decrease in symptoms of nausea & vomiting observed
Notes	Grade IIIC. Marked decrease in symptoms of nausea & vomiting observed - may not be synonymous with obstruction resolved. Low incidence of side effects reported in all patient groups.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	D - Not used

Hardy 1997a

Methods	Randomised double blind placebo controlled study
Participants	Inoperable bowel obstruction caused by cancer. All 25 patients with gynae cancer. Oncology centre
Interventions	Iv dexamethasone 16 mg/day for five days versus placebo.

Hardy 1997a (Continued)

Outcomes	Clinical resolution at five days. 10/14 in steroid group had resolution of bowel obstruction 5/10 in placebo group had resolution of bowel obstruction	
Notes	Grade IA. Well conducted study, large confidence intervals due to small samples, no intention to treat analysis. Mortality and some morbidity data also available	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	A - Adequate

Hardy 1997b

Methods	Randomised double blind placebo controlled study	
Participants	Inoperable bowel obstruction caused by cancer. All 14 patients with gynae cancer. Oncology centre	
Interventions	Iv dexamethasone 16 mg/day for five days versus placebo	
Outcomes	Clinical resolution at five days. 3/8 in steroid group had resolution of bowel obstruction. 3/5 in placebo group had resolution of bowel obstruction	
Notes	Grade 1A. Compared to Hardy 1997a this study allowed patients into trial if on intravenous fluids or previous episodes of obstruction.Well conducted study, large confidence intervals due to small samples, no intention to treat analysis. Mortality data and some morbidity data also available	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	A - Adequate

Laval 1998

Methods	Multi-centre randomised double blind placebo controlled study	
Participants	Inoperable bowel obstruction caused by cancer. 58 patients in bowel obstruction. 50/58 patients with gynae/GI cancer (86%). Prednisolone iv 40 mg od (n = 19) & prednisolone iv 240 mg od (n = 18) v placebo (n = 15). Data available on 52 patients. General hospital/oncology centre	
Interventions	Iv methylprednisolone 40 mg and iv methylprednisolone 240 mg v placebo.	
Outcomes	Resolution of bowel obstruction at day 4. 22/37 in steroid group had resolution of bowel obstruction. 5/15 in placebo group had resolution of bowel obstruction	
Notes	Grade IA. Analysis performed with dosage not taken into account. Well conducted study. No intention to treat analysis. Data from 6 patients missing. Mortality data also available	

Laval 1998 (Continued)

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	A - Adequate

Luczak 1995

Methods	Retrospective study of patients treated by unit from 1988 - 4/1995.	
Participants	93 patients had bowel obstruction. 83% due to Gynae/GI cancer. Hospice	
Interventions	Dexamethasone 16 to 40 mg/24 hrs (sc) given to nine patients.	
Outcomes	VAS for symptoms. No individual scores given "In 5 cases good results were obtained"	
Notes	Grade IIIC. Not clear if good results means symptom control or resolution of obstruction	

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	D - Not used

Philip 1998

Methods	Retrospective study of 33 patients (with 62 episodes of bowel obstruction) admitted to unit over 12 months	
Participants	13 patients with Gynae/GI cancer given steroids. Surgical unit/hospital	
Interventions	Dexamethasone 4 to 12 mg/day given, then dose reduction	
Outcomes	Evidence of restored GI function seen in five patients. Four patients no effect seen. Four patients had a symptomatic improvement and no obstruction (though response was not as clear due to rapid discharge from hospital)	
Notes	Grade IIIC. No control group, small sample size. No information on method of giving corticosteroids	

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	D - Not used

Thorsen 1994

Methods	Retrospective study of 100 consecutive patients from 7/91-1/92 that required medication via syringe driver
Participants	Patients with bowel obstruction (n = 7) not looked at separately. 24/100 patients with Gynae/GI cancer. Hospice
Interventions	Dexamethasone 5 to 20mg/24 hrs (sc)
Outcomes	No validated scores listed
Notes	Grade IIIC. Not clear what patients with bowel obstruction given and no individual scores given. "Dexamethasone "... particularly useful in intestinal obstruction"

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	D - Not used

Gynae = Gynaecological
GI = Gastrointestinal
s/c = subcutaneously
pr = per rectum
o = oral
VAS = visual analogue scale
im = intramuscular
iv = intravenous

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Ashino 1996	Review article
Clarke 1971	(Letter). Not relevant
Costa 1997	Review article
Fainsinger 1996	Review article
Fernando 1979	(Letter). Not relevant
Reid 1988	Report on use of steroids in bowel obstruction but no diagnosis given
Steiner 1991	Report on use of steroids in bowel obstruction, but no diagnosis given
Twycross 1997	Report on use of steroids in bowel obstruction, but no diagnosis given. Further data obtained from personal contact with author M. Baines (see Baines 1997 in included studies)
Walsh 1988	Review article

DATA AND ANALYSES

Comparison 1. steroids versus placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 unresolved bowel obstruction (available data)	3	89	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.51 [0.21, 1.23]
2 death at 1 month	3	83	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.91 [0.37, 2.23]

Analysis 1.1. Comparison 1 steroids versus placebo, Outcome 1 unresolved bowel obstruction (available data).

Analysis 1.2. Comparison 1 steroids versus placebo, Outcome 2 death at 1 month.

Comparison 2. sensitivity analysis

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 bowel obstruction-best scenario	3	97	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.51 [0.22, 1.19]
2 bowel obstruction-worst scenario	3	97	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.57 [0.24, 1.32]

Analysis 2.1. Comparison 2 sensitivity analysis, Outcome 1 bowel obstruction-best scenario. **Analysis 2.2. Comparison 2 sensitivity analysis, Outcome 2 bowel obstruction-worst scenario.** **APPENDICES****Appendix 1. MEDLINE search strategy**

1. exp Gastrointestinal Neoplasms/
2. exp Genital Neoplasms, Female/
3. exp Ovarian Neoplasms/
4. (gynaecological or gynecological).mp. [mp=ti, ot, ab, nm, hw]
5. (gastrointestin\$ or gastro-intestin\$ or intestin\$ or bowel\$ or colon\$ or colorectal or rectal\$ or stomach\$ or gastric\$).mp. [mp=ti, ot, ab, nm, hw]

6. (ovarian or ovary or ovaries).mp. [mp=ti, ot, ab, nm, hw]
7. (endometrial or endometrium).mp. [mp=ti, ot, ab, nm, hw]
8. (uterine or uterus or vaginal or vulvar or vagina\$).mp. [mp=ti, ot, ab, nm, hw]
9. (cervix or cervical).mp. [mp=ti, ot, ab, nm, hw]
10. or/4-9
11. Neoplasms/
12. (neoplasm\$ or cancer\$ or carcinoma\$ or tumor\$ or tumour\$).mp. [mp=ti, ot, ab, nm, hw]
13. or/11-12
14. 10 and 13
15. 1 or 2 or 3 or 14
16. exp Intestinal Obstruction/
17. ((bowel\$ or intestin\$ or gastrointestin\$ or gastro-intestin\$ or colon\$ or colorect\$ or retrosigmoid\$) and (obstruct\$ or blockage)).mp. [mp=ti, ot, ab, nm, hw]
18. or/16-17
19. exp Adrenal Cortex Hormones/
20. (17-ketosteroid\$ or androstenedione or androsterone or "estrone sulfate" or etiocholanolone or prasterone or dehydroepiandrosterone or hydroxycorticosteroid\$ or "11 hydroxycorticosteroid\$" or 17-hydrocorticosteroid\$ or deoxycorticosterone or deoxycorticosterone or pregnenolone or corticosteroid\$ or hydrocortisone or budesonide or prednisolone or methylprednisolone or efcorcortol or hydrocortone or "solu cortef" or budesonide or entocort\$ or budenofalk or "deltacortril enteric" or equilein or 18-hydroxycorticosterone or aldosterone or corticosterone or hydrocortisone or hydrocortisone or tetrahydrocortisol or tetrahydrocortisol or cortison or cortodoxone).mp. [mp=ti, ot, ab, nm, hw]
21. 19 or 20
22. 15 and 18 and 2

Appendix 2. Other search strategies

Database	Search strategy used
PaPaS trials register	((intestine or intestinal or bowel) AND (obstruction or blockage or obstructed)) AND (17-ketosteroids OR androstenedione OR androsterone OR "estrone sulfate" OR etiocholanolone OR prasterone OR dehydroepiandrosterone OR hydroxycorticosteroid* OR 17-hydrocorticosteroids OR deoxycorticosterone OR deoxycorticosterone OR pregnenolone OR corticosteroids OR hydrocortisone OR budesonide OR prednisolone OR methylprednisolone OR efcorcortol OR hydrocortone OR "solu cortef" OR budesonide OR entocort* OR budenofalk OR "deltacortril enteric" OR equilein OR 18-hydroxycorticosterone OR aldosterone OR corticosterone OR hydrocortisone OR hydrocortisone OR tetrahydrocortisol OR tetrahydrocortisol OR cortison OR cortodoxone))
CENTRAL	#1 exp Gastrointestinal Neoplasms/ #2. exp Genital Neoplasms, Female/ #3. exp Ovarian Neoplasms/ #4. (gynaecological or gynecological) #5. (gastrointestin* or gastro-intestin* or intestine* or bowel* or colon* or colorectal or rectal* or stomach* or gastric*) #6. (ovarian or ovary or ovaries) #7. (endometrial or endometrium) #8. (uterine or uterus or vaginal or vulvar or vagina*) #9. (cervix or cervical) #10. #4 or #5 or #6 or #7 or #8 or #9 #11. Neoplasms/ #12. (neoplasm* or cancer* or carcinoma* or tumor* or tumour*) #13. #11 or #12 #14. #10 and #13 #15. #1 or #2 or #3 or #14 #16. exp Intestinal Obstruction/ #17. ((bowel* near obstruct*) or (bowel* near blockage) or (intestin* NEAR obstruct*) or (intestin* near blockage) or (gastrointestin* near blockage) or (gastrointestin* near obstruct*) or (gastro-intestin* near blockage) or (gastro-intestin* near obstruct*) or (obstruct* near colon*) or (blockage near colon*) or (colorectal near obstruct*) or (colorectal near blockage) or (retro-sigmoid near obstruct*) or (retrosigmoid near blockage))

(Continued)

#18. #16 or #17

#19. exp Adrenal Cortex Hormones/

#20 (17-ketosteroids OR androstenedione OR androsterone OR (estrone next sulphate) OR etiocholanolone OR prasterone OR dehydroepiandrosterone OR hydroxycorticosteroids OR (11 next hydroxycorticosteroid) OR 17-hydroxycorticosteroids OR deoxycorticosterone OR deoxycorticosterone OR pregnenolone OR corticosteroids OR hydrocortisone OR budesonide OR prednisolone OR methylprednisolone OR efcortisol OR hydrocortone OR (solu next cortef) OR budesonide OR entocort* OR budenofalk OR (deltacortril next enteric) OR equilein OR 18-hydroxycorticosterone OR aldosterone OR corticosterone OR hydrocortisone OR hydrocortisone OR tetrahydrocortisol OR tetrahydrocortisol OR cortison OR cortodoxone)

#21. #19 or #20

#22. #15 and #18 and #21

EMBASE via OVID
(via www.embase.com)

((('gastrointestinal tumor'/exp AND [embase]/lim) OR ('stomach tumor'/exp AND [embase]/lim) OR ('intestine tumor'/exp AND [embase]/lim) OR ('female genital tract tumor'/exp AND [embase]/lim)) OR (((gynaecological OR gynecological OR 'female genital tract' AND [embase]/lim) OR (gastrointestinal* OR bowel* OR 'gastro intestinal' OR intestin* OR colon* OR colorectal* OR rectal* OR stomach OR gastric* OR ovarian OR ovary OR ovaries OR endometri* OR uterus OR uterine OR vagina* OR vulvar OR cervix OR cervical* AND [embase]/lim)) AND (('neoplasm'/de AND [embase]/lim) OR (neoplasm* OR cancer* OR carcinoma* OR tumour* OR tumor* AND [embase]/lim))) AND (('corticosteroid'/exp AND [embase]/lim) OR ('17 oxosteroid'/exp AND [embase]/lim) OR ('androstenedione'/exp AND [embase]/lim) OR ('androsterone'/exp AND [embase]/lim) OR ('estrone sulfate'/exp AND [embase]/lim) OR ('etiocholanolone'/exp AND [embase]/lim) OR ('prasterone'/exp AND [embase]/lim) OR ('hydroxycorticosteroid'/exp AND [embase]/lim) OR ('11 hydroxycorticosteroid'/exp AND [embase]/lim) OR ('deoxycorticosterone'/exp AND [embase]/lim) OR ('pregnenolone'/exp AND [embase]/lim) OR ('mineralocorticoid'/exp AND [embase]/lim) OR ('glucocorticoid'/exp AND [embase]/lim) OR ('corticosteroid'/exp AND [embase]/lim) OR ('corticosteroid derivative'/exp AND [embase]/lim) OR ('hydrocortisone'/exp AND [embase]/lim) OR ('budesonide'/exp AND [embase]/lim) OR ('prednisolone'/exp AND [embase]/lim) OR ('methylprednisolone'/exp AND [embase]/lim) OR ('hydrocortisone sodium phosphate'/exp AND [embase]/lim) OR ('hydrocortisone sodium succinate'/exp AND [embase]/lim) OR ('budenofalk'/exp AND [embase]/lim) OR (((('17-ketosteroids'/exp OR '17-ketosteroids') OR androstenedione OR ('androsterone'/exp OR 'androsterone') OR ('estrone'/exp OR 'estrone') OR ('etiocholanolone'/exp OR 'etiocholanolone') OR ('dehydroepiandrosterone'/exp OR 'dehydroepiandrosterone') OR ('hydroxycorticosteroids'/exp OR 'hydroxycorticosteroids') OR ('11-hydroxycorticosteroids'/exp OR '11-hydroxycorticosteroids') OR 17-hydroxycorticosteroids OR ('deoxycorticosterone'/exp OR 'deoxycorticosterone') OR ('pregnenolone'/exp OR 'pregnenolone') OR corticosteroids OR ('hydrocortisone'/exp OR 'hydrocortisone') OR ('budesonide'/exp OR 'budesonide') OR ('prednisolone'/exp OR 'prednisolone') OR ('methylprednisolone'/exp OR 'methylprednisolone') OR ('efcortisol'/exp OR 'efcortisol') OR ('hydrocortone'/exp OR 'hydrocortone') OR ('solu cortef'/exp OR 'solu cortef') OR budesonide OR entocort* OR ('budenofalk'/exp OR 'budenofalk') OR 'deltacortril enteric' OR equilein OR ('18-hydroxycorticosterone'/exp OR '18-hydroxycorticosterone') OR ('aldosterone'/exp OR 'aldosterone') OR ('corticosterone'/exp OR 'corticosterone') OR ('hydrocortisone'/exp OR 'hydrocortisone') OR ('tetrahydrocortisol'/exp OR 'tetrahydrocortisol') OR ('cortison'/exp OR 'cortison') OR ('cortodoxone'/exp OR 'cortodoxone')) AND [embase]/lim)) AND (((('intestine obstruction'/exp AND [embase]/lim) OR ('bowel obstruction' OR 'obstructed bowel' OR 'intestine obstruction' OR 'gastrointestinal obstruction' OR 'colon obstruction' OR 'colorectal obstruction' OR 'retrosigmoid obstruction' AND [embase]/lim) OR ('bowel blockage' OR 'intestine blockage' OR 'intestinal blockage' OR 'gastrointestinal blockage' OR 'colon blockage' OR 'colorectal blockage' OR 'retrosigmoid blockage' AND [embase]/lim) OR ('intestinal obstruction' OR 'intestinal blockage' AND [embase]/lim)) AND (malignan* AND [embase]/lim)) AND [embase]/lim

WHAT'S NEW

Date	Event	Description
5 June 2017	Review declared as stable	See Published notes .

HISTORY

Protocol first published: Issue 3, 1998

Review first published: Issue 3, 1999

Date	Event	Description
16 March 2015	Amended	See Published notes .
27 October 2008	Amended	Converted to RevMan 5
11 February 2008	New search has been performed	This is an update of a previously published review and no further excluded or included trials were identified.

CONTRIBUTIONS OF AUTHORS

Tasks and responsibilities were shared amongst the systematic review team for the first version of the review. For the update DF checked for any new studies, none of which were identified.

DECLARATIONS OF INTEREST

None known

SOURCES OF SUPPORT

Internal sources

- No sources of support supplied

External sources

- NHS Executive National Cancer Research and Development Programme NCP2/I211, UK.

NOTES

At 2015, it was decided to withdraw this review. However, in light of the revised Cochrane policy regarding updates, this review has been stabilised due to the fact that no new studies are expected in this area. This means that the conclusions of this review are considered up to date, as no new evidence with the potential to change the conclusions is expected.

INDEX TERMS

Medical Subject Headings (MeSH)

*Palliative Care; Gastrointestinal Neoplasms [*complications]; Genital Neoplasms, Female [*complications]; Glucocorticoids [*therapeutic use]; Intestinal Obstruction [*drug therapy] [*etiology]

MeSH check words

Female; Humans; Male