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Management of drainage for malignant ascites in gynaecological cancer

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Abstract

Background—Most patients with advanced ovarian cancer and some patients with advanced endometrial cancer need repeated drainage for malignant ascites. Guidelines to advise those involved in the drainage of ascites are usually produced locally and are generally not evidence-based but mainly based on clinicians' anecdotal evidence and experience. To discover whether there are ways of managing drains that have been demonstrated to improve the efficacy and quality of the procedure is key in making recommendations which could improve the quality of life (QOL) for women at this critical period of their lives.

Objectives—To evaluate the benefit and harms of different practices in the management of drains for malignant ascites in the care of women with advanced or recurrent gynaecological cancer. The review aimed to evaluate the evidence regarding the following questions; How long should the drain stay in place? Should the volume of fluid drained be replaced intravenously? Should the drain be clamped to regulate the drainage of fluid? Should any particular vital observations be regularly recorded?

Search methods—We searched the Cochrane Central Register of Controlled Trials (CENTRAL) Issue 1, 2009, Cochrane Gynaecological Cancer Group Trials Register, MEDLINE1950 to February Week 3 2009, Embase 1980 to 2009 Week 8 2009. We also searched registers of clinical trials, abstracts of scientific meetings, reference lists of review articles and contacted experts in the field.

Selection criteria—We searched for randomised controlled trials (RCTs), quasi-RCTs and non-randomised studies that compared a range of interventions for management of multiple

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CONTRIBUTIONS OF AUTHORS

AK and DF drafted the clinical sections of the review; HD and AB drafted the methodological sections of the review. All authors agreed the final version.

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DECLARATIONS OF INTEREST

None

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paracentesis in women with malignant ascites who had a confirmed histological diagnosis of gynaecological cancer.

Data collection and analysis—Two review authors independently assessed whether potentially relevant studies met the inclusion criteria. No trials were found and therefore no data were analysed.

Main results—The search strategy identified 1664 unique references of which 1646 were excluded on the basis of title and abstract. The remaining 18 articles were retrieved in full, but none satisfied the inclusion criteria.

Authors' conclusions—Since no relevant studies were identified, we are unable to make recommendations regarding the management of drains for malignant ascites in women with gynaecological cancer. Large, multi-centre RCTs are required to evaluate the efficacy and safety of the management of ascitic drains when in situ and their impact on QOL.

Medical Subject Headings (MeSH)

Ascites [etiology; *therapy]; Drainage [instrumentation; *methods]; Genital Neoplasms, Female [*complications]

MeSH check words

Female; Humans

BACKGROUND

Description of the condition

The peritoneum is a filmy membrane, which lines the abdomen. It is made up of two layers: one encloses the organs (such as the lower intestines) and the other lines the inside of the muscle wall of the abdomen. The peritoneum produces small amounts of fluid, which lubricate the two layers so that they slide easily over one another as a person moves about. Ascites is the name given to an accumulation of this fluid within the abdominal cavity. It is probably caused by a combination of several factors, including the production of excess fluid in response to inflammation, and fluid not draining away as it would normally. Ascites is present in both malignant and non-malignant disease, the former accounting for 10% of all cases.

In malignant disease, ascites may be present at diagnosis and also when disease recurs. Treatment with chemotherapy will often be successful in preventing ascites but in recurrence, when treatment is no longer effective nor a therapeutic option, ascites can be a persistently problematic symptom. Ascites is most commonly associated with cancer of the ovary which together with tumours originating in the breast, bowel, pancreas and endometrium account for 80% of cases of malignant ascites in female patients (Wilailak 1999).

Recurrent malignant ascites causes unpleasant symptoms that significantly reduce the quality of life for patients with advanced cancer. The accumulation and volume of fluid are

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difficult to predict, so women often have to be admitted to hospital as an emergency with a variety of symptoms including distension of the abdomen, anorexia, discomfort, nausea, constipation and breathlessness.

Description of the intervention

Fluid can be drained in a number of ways and Lee 1998 concludes that repeated abdominal paracentesis (drainage) is a widely used and effective procedure that can provide good symptomatic relief in the short term. This involves the placement of a fine tube into the abdomen which remains in place for several hours - sometimes days - to allow fluid to be released from the body to provide relief from symptoms. Other methods of drainage include the insertion of permanent tunnelled catheters, peritoneo-venous shunts or use of diuretics (MacDonald 2006). Although multiple paracentesis (repeated drainage of the fluid) is a commonly performed intervention, there is little consensus on the management of drainage of ascites. Some women remain in hospital longer than others for the procedure; some may have replacement fluids given intravenously but others may not; and some may be given dietetic and nutritional support while others are not; some may have a higher complication rate than others. So, from hospital to hospital and sometimes even from ward to ward, the management of women having drainage of ascites may vary. The differing standards of practice and the management may affect the quality of life (QOL) of these women at a period (the palliative phase of the illness), when life is poignantly precious.

Why it is important to do this review

Patients with advanced ovarian cancer and some patients with advanced endometrial cancer often need repeated drainage for malignant ascites (Jatoi 2005;Mackey 1996). Women often wait for as long as possible before seeking intervention, or are advised by health care professionals to wait for drainage until there is a large enough volume of fluid to ensure that it is amenable for safe drainage. This means that women with recurrent ascites often experience fatigue, discomfort, anorexia, breathlessness, constipation and frequency of micturition before hospital admission to be therapeutically drained. Furthermore, the increase in treatment options in recent years allows time for an increase in incidence of complications such as ascites. During 2007 to 2008, malignant ascites accounted for over 28,000 bed-days in hospitals in England (HES statistics).

Guidelines to advise those involved in the drainage of ascites have mainly been produced locally by teams and much of this is not evidence based but mainly based on clinicians' anecdotal evidence and experience (MacDonald 2006). They can be outdated and variable within the same setting as the procedure can take place in several areas within the same hospital. The lack of national standards or guidance may lead to inequity and varying levels of care, which may adversely affect the quality of life of women who require regular hospital admission for drainage of ascites.

Becker 2006 carried out a systematic review of the evidence from all types of studies on the effectiveness of paracentesis, diuretics and peritoneo-venous shunting in the management of malignant ascites, but did not report quality of life outcomes. Ascites is a major aspect of the chronic complication of ovarian cancer, which is the sixth most common cancer among

women, with an incidence of between 2 and 12 cases/year in 100,000 women (median 7.5 cases/year in 100,000 women) (IARC 2005). Effective, consistent, evidence based management would clearly impact on the QOL for this group of patients (MacDonald 2006).

OBJECTIVES

To evaluate the benefit and harms of different practices in the management of drains for malignant ascites in the palliative care of women with gynaecological cancer.

The review aimed to evaluate the evidence regarding the following questions:

- How long should the drain stay in place?
- Should the volume of fluid drained be replaced intravenously?
- Should the drain be clamped to regulate the drainage of fluid?
- Should any particular vital observations be regularly recorded?

METHODS

Criteria for considering studies for this review

Types of studies

- Randomised controlled trials (RCTs)

As Becker 2006found no evidence from RCTs, we also searched for the following types of non-randomised studies with concurrent comparison groups:

- Quasi-randomised trials, non-randomised trials (pre-planned studies where data on controls are sampled concurrently e.g. in patients who refuse to be randomised or in patients from another department), prospective and retrospective comparative cohort studies, and case series of 30 or more patients.
- Controlled before and after studies (CBA) i.e. studies that assign groups to intervention and control groups other than at random, and which include assessment of the main outcomes before and after the intervention. These studies will be included only if they satisfy certain quality criteria:

  ○Contemporaneous data collection (pre- and post-intervention periods for intervention and control sites are the same), and

  ○ Intervention and control sites are comparable with respect to e.g. patient characteristics;
- Interrupted time series (ITS) i.e. studies designed to assess whether a change in trend occurred which could be attributable to an intervention. These studies will be included only if they satisfy certain quality criteria:

  ○ Study includes a clearly defined point in time when the intervention occurred, and

○ At least three data points were recorded before and three recorded after the intervention.

Case-control studies and case series of fewer than 30 patients were excluded.

Types of participants—Women with malignant ascites who had a confirmed histological diagnosis of gynaecological cancer (cancer of the body of uterus, vagina/fallopian tube, ovary, vulva) and whose drainage was managed in hospital. Women with cervical cancer were not included as they rarely develop malignant ascites.

Types of interventions—The following comparisons were planned with regard to the management of multiple paracentesis (repeated drainage of fluid):

- shorter versus longer length of time for drain remaining in place
- intravenous replacement of fluid versus no intravenous replacement of fluid
- clamping of drain versus no clamping of drain
- recording of vital observations versus no recording of vital observations
- multifactorial interventions (which include any combination of any of the above interventions) versus usual practice

Types of outcome measures

Primary outcomes

1. QOL, measured by a validated scale

Secondary outcomes

1. Patient satisfaction, as measured by either a binary (yes/no) response or a validated scale
2. Adverse events:
    - **i.** infection
    - **ii.** perforation
    - **iii.** peritonitis
    - **iv.** hypotension
    - **v.** catheter blockage

Search methods for identification of studies

Papers in all languages were sought and translations carried out if necessary.

Electronic searches—See: Cochrane Gynaecological Cancer Group methods used in reviews.

Trials were identified by searching the Cochrane Gynaecological Cancer Group trials register (searched for ASCIT*), Cochrane Central Register of Controlled Trials

(CENTRAL), Issue 1 2009, MEDLINE Ovid (January 1950 to February week 3 2009), EMBASE Ovid (1980 to 2009 week 08).

The following electronic databases were searched:

1. The Cochrane Gynaecological Cancer Collaborative Review Group's Trial Register
2. MEDLINE (1966-present)
3. EMBASE (1980-present)
4. Cocrane Central Register of Controlled Trials (CENTRAL) on the Cochrane Library

The Medline, Embase and CENTRAL search strategies are presented in Appendix 1, Appendix 2 and Appendix 3 respectively. In addition, we searched the Cochrane Database of Systematic Reviews, SIGLE and CINAHL the keyword "malignant ascites".

Searching other resources

Unpublished and Grey literature: Metaregister (http://www.controlled-trials.com/rct), Physicians Data Query (http://www.nci.nih.gov), http://www.clinicaltrials.gov and http://www.cancer.gov/clinicaltrials were searched for ongoing trials. Conference proceedings and abstracts were searched through ZETOC (http://zetoc.mimas.ac.uk) and WorldCat Dissertations. We handsearched the journal: Supportive Cancer Therapy.

Reference lists: The reference lists of all eligible trials, key textbooks, and previous systematic reviews were searched for additional studies. All included articles found were identified on PubMed and, using the 'related articles' feature, a further search was carried out for newly published articles.

Correspondence: Authors of relevant trials were contacted to ask if they knew of further data which may or may not have been published.

Data collection and analysis

Selection of studies—All titles and abstracts retrieved by electronic searching were downloaded to the reference management database Endnote, duplicates were removed and the remaining references examined by two review authors (AK, DF) independently. Those studies which clearly did not meet the inclusion criteria were excluded and copies of the full text of potentially relevant references were obtained. The eligibility of retrieved papers was assessed independently by two review authors (AK, DF). We did not identify any studies suitable for inclusion in the review. Should such studies be identified for future updates of the review the following methods will be employed (see below).

Data extraction and management—For included studies, the following details will be abstracted independently by two review authors (AK, DF) onto a data abstraction form designed for the review: author, year of publication (if published) and journal citation (including language), country, setting, study design, characteristics of patients (inclusion and exclusion criteria, age, cancer diagnosis (histology), FIGO stage at diagnosis, co-morbidity,

previous treatment, disease-free interval, number enrolled in each arm) and total number of interventions with full descriptive details (drainage technique; type of drain; type of healthcare professional who manages the drainage; venue for drainage; length of time drains should be in situ; the frequency of drainage; the volume of ascites drained; instructions during drainage on replacement fluids and observations, patient information and dietary advice), risk of bias, duration of follow-up, numbers lost to follow up, and deviations from protocol. For outcomes we will report data on quality of life, patient satisfaction and adverse events. An outcome definition (with diagnostic criteria if relevant) will be reported for each outcome, as well as the unit of measurement (if relevant). For scales we will report the upper and lower limits, and whether high or low scores are good. We will report the number of participants allocated to each intervention group and for each outcome of interest the sample size and number of missing participants will be reported.

Data on all primary and secondary outcomes that are reported will be extracted as below:

- ○ For dichotomous outcomes (e.g. adverse events), we will extract the number of patients in each treatment arm who experienced the outcome of interest and the number of patients assessed at endpoint, in order to estimate a relative risk (RR).
- ○ For continuous outcomes (e.g. QOL, patient satisfaction), we will extract the final value and standard deviation of the outcome of interest and the number of patients assessed at endpoint in each treatment arm at the end of follow-up, in order to estimate the mean difference (if trials measured outcomes on the same scale) or standardised mean differences (if trials measured outcomes on different scales) between treatment arms and its standard error.

Both unadjusted and adjusted statistics will be extracted, if reported. If adjusted statistics are reported, we will note the variables used in adjustment.

Where possible, all data extracted will be those relevant to an intention-to-treat analysis, in which participants are analysed in groups to which they were assigned.

The time points at which outcomes were collected and reported will be noted.

Data will be abstracted independently by two review authors (AK, DF) onto a data abstraction form specially designed for the review. Differences between review authors will be resolved by discussion or by appeal to a third review author if necessary (AB or HD).

Assessment of risk of bias in included studies—The risk of bias in included RCTs will be assessed using the following questions and criteria:

Sequence generation: Was the allocation sequence adequately generated?

- Yes: e.g. a computer-generated random sequence or a table of random numbers
- No: e.g. date of birth, clinic id-number or surname
- Unclear: e.g. not reported

Allocation concealment: Was allocation adequately concealed?

- Yes: e.g. where the allocation sequence could not be foretold
- No: e.g. e.g. allocation sequence could be foretold by patients, investigators or treatment providers
- Unclear: e.g. not reported

Blinding: Was knowledge of the allocated interventions adequately prevented (from outcome assessors) during the study?

- Yes
- No
- Unclear

Incomplete reporting of outcome data: We will record the proportion of participants whose outcomes were not reported at the end of the study; we will note if loss to follow-up was not reported.

Were incomplete outcome data adequately addressed?

- Yes, e.g. low level (< 20%) of missing outcome data or reasons for missing outcome data unlikely to be related to outcome or missing outcome data balanced in numbers across intervention groups with similar reasons for missing data across groups
- No, e.g. high level (≥20%) of missing outcome data or reasons for missing outcome data likely to be related to outcome with imbalance across groups in numbers or reasons for missing data
- Unclear if loss to follow-up was not reported

Selective reporting of outcomes: Are reports of the study free of suggestion of selective outcome reporting?

- Yes: e.g. if review reports all outcomes specified in the protocol
- No, otherwise
- Unclear, if insufficient information available.

Other potential threats to validity: Was the study apparently free of other problems that could put it at a high risk of bias?

- Yes
- No
- Unclear

The risk of bias in non-randomised studies will be assessed in accordance with four additional criteria:

Cohort selection

1. Were relevant details of criteria for assignment of patients to treatments provided?
    i. Yes
    ii. No
    iii. Unclear
2. Was the exposed cohort representative?
    i. Yes, if representative of women with gynaecological cancer who have malignant ascites
    ii. No, if groups of patients were selected
    iii. Unclear, if selection of group was not described
3. Was the non-exposed cohort selected satisfactorily?
    i. Yes, if drawn from the same community as the exposed cohort
    ii. No, if drawn from a different source
    iii. Unclear, if selection of group not described

Comparability of treatment groups

1. Were there no differences between the two groups or were differences controlled for, in particular with reference to extent of disease, QOL and nutritional status (e.g. as indicated by serum albumin) at start of treatment.
    i. Yes, if these characteristics were reported and any reported differences between treatment groups were controlled for
    ii. No, if these characteristics were reported and any reported differences between treatment groups were not controlled for
    iii. Unclear, if these characteristics were not reported.

Controlled before and after studies: For controlled before and after studies we would have assessed blinding and loss to follow up as specified above and additionally assess the following:

Baseline measurement

- Yes, if primary outcomes were measured before the intervention, and showed no substantial differences between intervention and control groups
- No, differences between groups in primary outcomes at baseline could explain post-intervention differences
- Unclear, if baseline measures are not reported, or if it is unclear whether baseline measures differ substantially different between intervention and control groups

Protection against contamination (Studies using second site as control)

- Yes, if allocation was by community, institution, or practice and it is unlikely that any patients in the control group received the intervention
- No, if it is likely that some patients in the control group received the intervention
- Unclear

Interrupted time series: For interrupted time series studies we will assess blinding and loss to follow up as specified above and additionally assess the following:

The intervention is independent of other changes

- Yes, if the intervention was independent of other changes over time that were likely to affect outcomes
- No, if intervention was not independent of other changes in time that were likely to affect outcomes
- Unclear

Data were analysed appropriately

- Yes, if serial correlation was adjusted/tested for (e.g. by using ARIMA models or time series regression models)
- No, if serial correlation was not adjusted/tested for
- Unclear

Reason for the number of points pre- and post-intervention given

- Yes, if rationale for the number of points was stated (e.g. monthly data for 12 months post-intervention was used because the anticipated effect was expected to decay), or a sample size calculation was performed
- No, if it is clear that conditions above are not met
- Unclear

Shape of the intervention effect was specified

- Yes, if a rational explanation for the shape of intervention effect was given by the author(s)
- No, if it is clear that the condition above is not met
- Unclear

Intervention unlikely to affect data collection

- Yes, if intervention itself was unlikely to affect data collection (e.g. sources and methods of data collection were the same before and after the intervention)
- No, if the intervention itself was likely to affect data collection

- Unclear

The risk of bias tool will be applied independently by two review authors (AK, DF) and differences resolved by discussion or by appeal to a third review author (AB or HD). Results will be presented in both a risk of bias graph and a risk of bias summary. Results of meta-analyses will be interpreted in light of the findings with respect to risk of bias

Measures of treatment effect—We will use the following measures of the effect of treatment:

- For dichotomous outcomes, we will use the RR.
- For continuous outcomes, we will use the mean difference between treatment arms if all trials measured the outcome on the same scale, otherwise standardised mean differences will be used.

Dealing with missing data—We will not impute missing outcome data; if only imputed outcome data are reported, we will contact trial authors to request data on the outcomes only among participants who were assessed

Assessment of heterogeneity—Heterogeneity between studies will be assessed by visual inspection of forest plots, by estimation of the percentage heterogeneity between trials which cannot be ascribed to sampling variation (Higgins 2003), and by a formal statistical test of the significance of the heterogeneity (Deeks 2001) and, if possible, by sub-group analyses (see below). If there his evidence of substantial heterogeneity, the possible reasons for this will be investigated and reported.

Assessment of reporting biases—Funnel plots corresponding to meta-analysis of the primary outcome will be examined to assess the potential for small study effects. When there is evidence of small-study effects, publication bias will be considered as only one of a number of possible explanations. If these plots suggest that treatment effects may not be sampled from a symmetric distribution, as assumed by the random effects model, sensitivity analyses will be performed using fixed effects models.

Data synthesis—If sufficient, clinically similar studies are available, their results will be pooled in meta-analyses. Adjusted summary statistics will be used if available; otherwise unadjusted results will be used.

- For any dichotomous outcomes, RRs will be pooled
- For continuous outcomes, the mean differences between the treatment arms at the end of follow-up will be pooled using the mean difference method if all trials measured the outcome on the same scale, or using the standardised mean difference method otherwise

Random effects models with inverse variance weighting will be used for all meta-analyses (DerSimonian 1986).

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If possible, indirect comparisons, using the methods of Bucher 1997 will be used to compare competing interventions that have not been compared directly with each other.

Subgroup analysis and investigation of heterogeneity—No sub-group analyses are planned. Heterogeneity will be interpreted in relation to: ease of access to the intervention; characteristics of local services; extent of disease, nutritional status and comorbidity (e.g. presence/absence of sub-acute intestinal obstruction) at start of treatment; type of study design and risk of bias.

Sensitivity analysis—Sensitivity analyses will be performed (i) excluding non-randomised studies if RCTs have been included (ii) excluding studies at high risk of bias and (iii) using unadjusted results.

RESULTS

Description of studies

Results of the search—The search strategies identified 1664 unique references. The abstracts of these were read independently by two review authors and articles which obviously did not meet the inclusion criteria were excluded at this stage. Eighteen articles were retrieved in full. The full text screening of these 18 studies excluded all of the studies for the reasons described in the table Characteristics of excluded studies.

Searches of the Cochrane Database of Systematic Reviews, SIGLE and CINAHL using the keyword “malignant ascites” yielded 0, 323 and 44 references, but none of these were relevant to our review.

Two review authors independently searched the grey literature; these searches did not identify any relevant studies.

Included studies—No studies met our inclusion criteria.

Excluded studies—The full text was obtained for 18 references, but all were excluded from the review for the reasons given in Characteristics of excluded studies. Three references Becker 2006; Chung 2008; Adam 2004 were reviews of the management of malignant ascites but were not specific to drainage. We checked the references in these reviews, but none met our inclusion criteria. Four references were comments on other papers Amiel 1984; Walton 2007; Winter 1997; Yong 2008; two studies considered in-dwelling, long-term Pleurx drainsCourtney 2008; Rosenberg 2004; the remaining studies did not compare interventions for the management of drainage.

Risk of bias in included studies

No trials were found and therefore the risk of bias tool was not applied.

Effects of interventions

No data were available.

DISCUSSION

Summary of main results

We did not identify any studies that evaluated the benefit and harms of differing interventions in the management of drains for malignant ascites in the palliative care of women with gynaecological cancer. Therefore the questions of how long should the drain stay in place, whether the volume of fluid drained should be replaced intravenously, whether the drain should be clamped to regulate the drainage of fluid and whether any particular vital observations should be regularly recorded, remain unanswered. We specified quality of life as the primary outcome of interest, as it is a major objective of palliation of symptoms in cancer care. Treatment-related morbidity very often degrades the quality of the time that patients live, which is especially important after the completion of cancer treatment when patients will want to enjoy a comfortable standard of living during their final months.

Overall completeness and applicability of evidence

When we initiated this review, long-term, in-dwelling catheters were not licensed for the drainage of abdominal ascites, so we were unable to consider them in this review. Practice has since evolved and these drains are now more commonly used and have recently been licensed to enable home management of ascitic drainage. Studies on long-term drains have looked at complication rates (Courtney 2008); compared large volume ascitic drainage with Pleurx long-term drains (Rosenberg 2004) and reviewed the management of interventions for ascites including long-term drains, repeated paracentesis, and chemotherapeutic options (Chung 2008).

Potential biases in the review process

A comprehensive search was performed, including a thorough search of the grey literature and all studies were sifted and data extracted by two reviewers independently. We were not restrictive in our inclusion criteria with regards to types of studies as we planned to include non-randomised studies with concurrent comparisons groups as the review of Becker 2006 suggested that we would not find any relevant RCTs. Therefore we attempted to ensure that we did not overlook any relevant evidence by searching a wide range of reasonable quality non-randomised study designs (case-control studies and case series of fewer than 30 patients were excluded). The greatest threat to the validity of the review is likely to be publication bias i.e. studies that did not find the treatment to have been effective may not have been published. We were unable to assess this possibility as we did not find any studies that met the inclusion criteria.

Agreements and disagreements with other studies or reviews

Becker 2006 made recommendations for the management of malignant ascites, based on a systematic review of the evidence for the effectiveness of different techniques, including the use of peritoneovenous shunts, drainage and diuretics. The review concluded that, although paracentesis, diuretics and shunting are commonly used procedures, the evidence for these treatment options is weak. Although it made recommendations about the management, not only of drainage but also of other treatment options, the grade of all recommendations was

low (D), reflecting the poor quality evidence. Guidelines such as these may lead to continuation of usual practice which may be based on anecdote rather than sound evidence.

Stephenson, 2002 evaluated the effect of introducing guidelines for the management of drainage into two hospitals and two hospices. These guidelines were based on clinical experience rather than good quality evidence. The only patient-centred outcome assessed was symptomatic hypotension. As the study lacked a concurrent comparison group, any changes before and after introduction of guidelines could have been due to other changes over time in patient management or case mix.

Chung 2008 reviewed standard approaches - diuretics, paracentesis, permanent drains and shunts - and explored newer therapies. This review attempted to extrapolate the principles of management of non-malignant ascites to management of malignant ascites.

Adam 2004 reviewed both conventional and novel therapies from the perspective of the pathophysiology of ascites and how this might guide treatment choices. The review acknowledged that results of treatment alternatives are inconsistent.

However, neither Chung 2008 nor Adam 2004 systematically searched the literature and neither review evaluated the quality of included studies or produced recommendations. Neither review found studies that compared different methods of managing in situ drains.

In contrast, our review focused on paracentesis, the most commonly performed procedure for the management of malignant ascites. Our objective was to systematically review the available evidence in order to ascertain the best way to manage drains during the period when they are in place, with particular reference to their effect on a woman’s quality of life.

AUTHORS’ CONCLUSIONS

Implications for practice

We are unable to make any evidence-based recommendations as we found no studies assessing interventions in the management of drains for malignant ascites in the care of women with advanced or recurrent gynaecological cancer.

We are concerned that guidelines, such as those of Becker 2006 or Stephenson, 2002, will be incorporated into hospital protocols that are not evidence-based.

Implications for research

High quality, comparative studies, preferably RCTs are needed, firstly, to adequately ascertain the best way to manage drains in gynaecological cancer patients in hospital and, secondly, to compare the risks and benefits of conventional drainage with the recently licensed Pleurx drains which enable home management of ascitic drainage.

Ideally, a large randomised controlled trial is needed to compare the risks and benefits of differing techniques for managing drains for malignant ascites. Although gynaecological cancer accounts for only 2% of all malignancies (GLOBOCAN 2002), the incidence of ascites in patients with ovarian cancer is disproportionately high and has been reported as

20% (Mackey 1996). Therefore it could be argued that the responsibility for conducting research into malignant ascites lies largely with health professionals working within gynaecological cancer.

Trials in patients who are nearing the palliative phase of their disease are known to be problematic because of the need to ensure no further morbidity is experienced. If an RCT were to be considered, it would need to run in several centres in order to gather sufficient numbers. The difficulty in predicting the length of survival would need to be taken into account in order to establish an achievable timeframe to capture quality of life outcomes.

However, if such a trial is not possible then it is important to conduct well designed non-randomised studies that use multivariate analysis to adjust for baseline imbalances.

Patients' quality of life should be assessed using a validated instrument such as an EORTC quality of life questionnaire Echteld 2006; patient satisfaction could also be measured. Adverse events such as infection, perforation, peritonitis and hypotension should be recorded. Adequate data on adverse events may require non-randomised, observational studies of good methodological quality, as randomised controlled trials often do not yield sufficient data on adverse events.

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SOURCES OF SUPPORT

Internal sources

- No sources of support supplied

External sources

- Department of Health, UK.

NHS Cochrane Collaboration programme Grant Scheme CPG-506

Appendix 1. Medline Ovid search strategy

1. exp Endometrial Neoplasms/
2. exp Uterine Neoplasms/
3. exp Uterine Cervical Neoplasms/
4. exp Ovarian Neoplasms/
5. exp Vaginal Neoplasms/
6. exp Fallopian Tube Neoplasms/
7. exp Vulvar Neoplasms/
8. exp Choriocarcinoma/

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9. ((endometr* or uter* or cervi* or ovar* or vagin* or fallopian or vulva* or gynae* or gyne*) adj5 (cancer* or neoplas* or carcinom* or malignan* or tumor* or tumour*)).mp.
10. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9
11. exp Ascites/
12. exp Ascitic Fluid/
13. (peritone* adj5 effusion*).mp.
14. (peritone* adj5 fluid).mp.
15. hydroperiton*.mp.
16. ascites.mp.
17. ascitic fluid.mp.
18. 11 or 12 or 13 or 14 or 15 or 16 or 17
19. malignan*.mp.
20. 18 and 19
21. 10 and 20
22. Animals/
23. Humans/
24. 22 not (22 and 23)
25. 21 not 24

key: mp=title, original title, abstract, name of substance word, subject heading word

Appendix 2. Embase Ovid search strategy

1. exp Endometrium Tumor/
2. exp Uterus Cancer/
3. exp Uterine Cervix Tumor/
4. exp Ovary Tumor/
5. exp Vagina Tumor/
6. exp Uterine Tube Tumor/
7. exp Vulva Tumor/
8. exp Choriocarcinoma/
9. ((endometr* or uter* or cervi* or ovar* or vagin* or fallopian or vulva* or gynae* or gyne*) adj5 (cancer* or neoplas* or carcinom* or malignan* or tumor* or tumour*)).mp.

10. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9
11. exp Ascites/
12. exp Ascites Tumor/
13. (peritone* adj5 effusion*).mp.
14. (peritone* adj5 fluid).mp.
15. hydroperiton*.mp.
16. ascites.mp.
17. ascitic fluid.mp.
18. 11 or 12 or 13 or 14 or 15 or 16 or 17
19. malignan*.mp.
20. 18 and 19
21. 10 and 20
22. exp Animal/
23. Human/
24. 22 not (22 and 23)
25. 21 not 24

key: mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer name

Appendix 3. CENTRAL search strategy

1. MeSH descriptor Endometrial Neoplasms explode all trees
2. MeSH descriptor Uterine Neoplasms explode all trees
3. MeSH descriptor Uterine Cervical Neoplasms explode all trees
4. MeSH descriptor Ovarian Neoplasms explode all trees
5. MeSH descriptor Vaginal Neoplasms explode all trees
6. MeSH descriptor Fallopian Tube Neoplasms explode all trees
7. MeSH descriptor Vulvar Neoplasms explode all trees
8. MeSH descriptor Choriocarcinoma explode all trees
9. (endometr* or uter* or cervi* or ovar* or vagin* or fallopian* or vulva* or gynae* or gyne*) near/5 (cancer* or neoplas* or carcinom* or malignan* or tumor* or tumour*)
10. (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9)
11. MeSH descriptor Ascites explode all trees

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12. MeSH descriptor Ascitic Fluid explode all trees
13. peritone* near/5 effusion*
14. peritone* near/5 fluid
15. hydroperiton*
16. ascites
17. ascitic fluid
18. (#11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17)
19. malignan*
20. (#18 AND #19)
21. (#10 AND #20)

CHARACTERISTICS OF STUDIES

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Adam 2004	Not a study of management of drainage; review of treatment options
Amiel 1984	Comment on use of diuretics; four case reports.
Appelqvist 1982	Not a study of management of drainage, considering therapeutic interventions for malignant ascites
Ayantunde 2007	Not a study of management of drainage; retrospective study of pattern of ascites and prognostic factors
Becker 2006	Systematic review of management of malignant ascites; not specifc to ascitic drains
Chung 2008	Review of treatment of ascites; not specific to ascitic drains
Courtney 2008	Considers use of long-term Pleurx drains; not a comparison of drainage techniques
Easson 2007	Evaluation of a quality of life questionnaire
Garrison 1986	Comparing ascitic protein concentration and its relationship to survival
Mackey 1996	Does not compare different methods of management of drains
Malik 1991	Not a study of management of drainage
Morita 2005	Compares dehydration vs. rehydration in patients with ascites. Drainage not discussed
Rosenberg 2004	Compares long-term Pleurx drains with paracentesis.
Stratton 1981	Examines cytological profile of ascites.
Walton 2007	Abstract - discussion of Adams review
Wilailak 1999	Not a study of management of drainage; retrospective study to establish primary site of cancer
Winter 1997	Letter commenting on another paper
Yong 2008	Letter presenting a case report

DATA AND ANALYSES

This review has no analyses.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We have clarified that only drains that are managed in hospital were relevant to the review (see Types of participants).

We have added catheter blockage as a secondary outcome (see Secondary outcomes).

We handsearched the journal: Supportive Cancer Therapy.

WHAT'S NEW

Last assessed as up-to-date: 9 November 2009.

Date	Event	Description
26 February 2014	Amended	Contact details updated.

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* *Indicates the major publication for the study*

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PLAIN LANGUAGE SUMMARY

Methods for the drainage of fluid containing cancer cells that collect in the abdomen in women with a gynaecological cancer

Patients with advanced ovarian cancer and some patients with advanced endometrial cancer often need repeated drainage for malignant ascites. Guidelines to advise those involved in the drainage of ascites are usually produced locally and are generally not evidence-based but mainly based on clinicians' anecdotal evidence and experience.

We searched for studies that compared different ways of managing the drainage of fluid containing cancer cells that collect in the abdomen in women with a gynaecological cancer. We checked 1664 possible articles but no relevant studies were identified. Therefore there is no evidence in favour of any specific drainage technique for a condition that can severely diminish a patient's QOL at a time when It is especially important that a patient can enjoy a comfortable life as free as possible from problems and symptoms.

The review highlights the need for good quality studies comparing different methods of managing drains.