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Review

The use of a peritoneal gas drain following gynecological laparoscopy: a systematic review

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ABSTRACT

We performed a systematic review of the randomized controlled trials (RCTs) reporting on the use of a peritoneal gas drain following gynecological laparoscopy. The standard medical databases were searched for studies published prior to with no restrictions for language, country of origin, blinding or sample size. We defined the primary endpoints: shoulder and total pain at 4–6, 24 and 48 h following laparoscopy and secondary endpoints: women satisfaction, requirement of analgesia and antiemetics. The quality of the included RCTs was assessed by the guideline of the Cochrane Collaboration. Based on the data from 5 moderate quality RCTs we concluded that there is very little evidence of an overall benefit from using a peritoneal gas drain following gynecological laparoscopy The possible reduction of shoulder and total pain is not associated with a reduction in the requirement of analgesia and antiemetics when compared to the control group.

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Introduction

Over the last 4 decades laparoscopy has evolved to become the gold standard approach for many gynecological procedures including removal of ectopic pregnancy, excision of endometriosis, or removal of ovarian cysts, with over 65,000 therapeutic and over 85,000 diagnostic gynecological laparoscopies performed in 2011/2012 in England [1].

During laparoscopy, carbon dioxide is insufflated in order to distend the peritoneal cavity, creating a pneumoperitoneum. Following the laparoscopic procedure, some residual gas inevitably remains in the peritoneal cavity and it has been aetiologically linked

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with the experience of pain in the recovery period [2,3]. It has been suggested that post-operative shoulder pain is the result of peritoneal stretching and irritation of the diaphragm and phrenic nerve caused by the carbon dioxide insufflations [4,5]. The incidence of shoulder pain following laparoscopy has been reported to vary between 35% and 61% decreasing the patient's satisfaction [6,7].

Various techniques have been attempted in order to decrease the pain following laparoscopy: intraperitoneal installation of saline [8] and local anaesthetics [9], pulmonary recruitment manoeuvre [10], gasless laparoscopy [11].

The use of a peritoneal gas drain in the first 4–6 h following laparoscopy has been reported to decrease the volume of residual intraperitoneal gas and consequently ameliorate the symptoms in the recovery period, but the results are conflicting [12,13].

The objective of this study was to appraise critically the published randomized controlled trials reporting on the use of a peritoneal gas drain following gynecological laparoscopy.

Methods

A comprehensive literature search has been performed independently by 2 of the present authors. We searched Medline, EMBASE, Science Citation Index Expanded and Cochrane Central Register of Controlled Trials using the PICO Method [14] for medical subject headings (MeSH) "laparoscopy", "pain", "drain", "suction", "gases" in combination with free terms "shoulder", "nausea", "analgesia", "antiemetics", "score".

Randomized controlled trials (RCTs) published prior to December 2013, reporting on the use of a peritoneal gas drain following gynecological laparoscopy, irrespective of language, country of origin, blinding or sample size, were included in this systematic review.

We selected our primary endpoints: shoulder and total pain at 4–6, 24 and 48 h following laparoscopy and secondary endpoints: women satisfaction, requirement of analgesia and antiemetics.

We extracted the data related to year and country of study, age of participants, duration of procedure, carbon dioxide volume, follow up duration, operative procedure, intervention in experimental and control groups, number of patients, shoulder and total pain at 4–6, 24 and 48 h post laparoscopy, women satisfaction, analgesia and antiemetics requirement, randomization, concealment, blinding, and we presented it in tables.

The risk of bias was assessed by the guideline of the Cochrane Collaboration [15] and illustrated as a risk of bias graph.

Results

The systemic literature search identified 216 different studies related to the use of a peritoneal gas drain following gynecological laparoscopy. The PRISMA flow chart to explain the RCTs selection is shown in Fig. 1. Five RCTs [16–20] evaluating 463 women allocated to experimental group or control group for reporting the effect of peritoneal gas drain following gynecological laparoscopy were included in the systematic review. There were 237 women in the experimental group and 226 women in the control group. The characteristics of the included RCTs are shown in Table 1, and the procedure protocols used for the women in all of the RCTs are shown in Table 2. Variables used in the systematic review are shown in Table 3. Data was insufficient to perform meta-analysis. One RCT [19] included 4 arms and we used the data as 2 RCTs. One

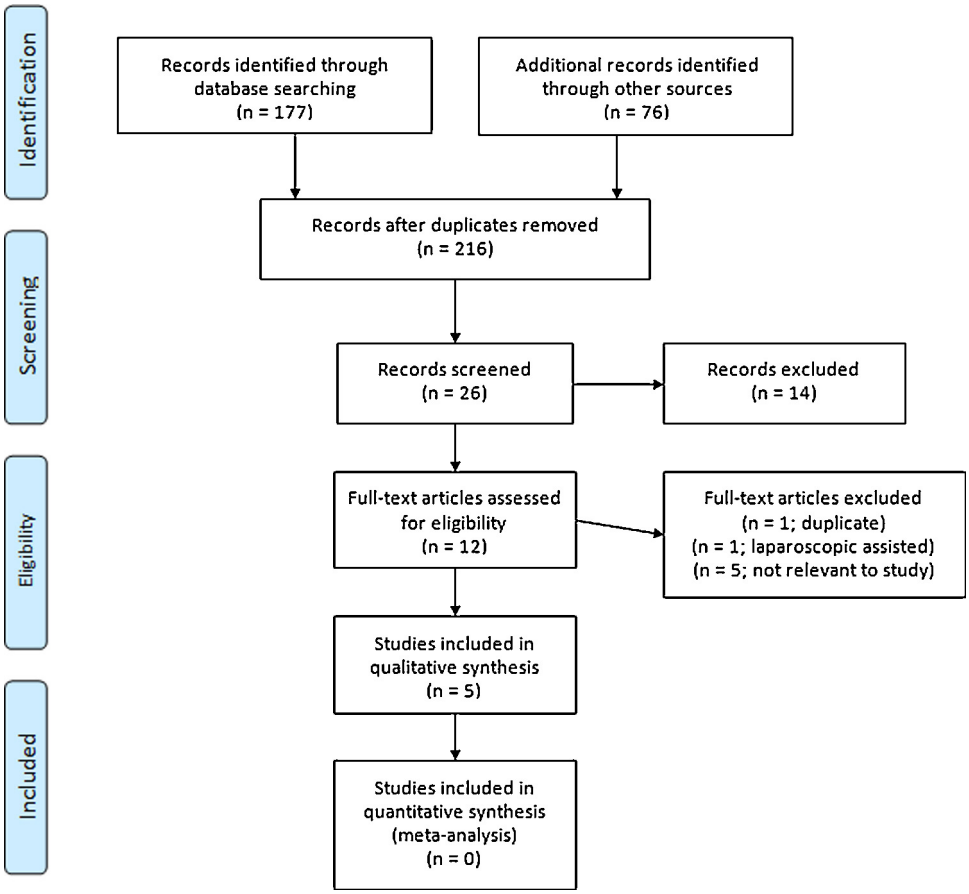

Fig.1. PRISMA flow chart showing trial selection methodology.