

GYNECOLOGY

The effect of bipolar electrocoagulation during ovarian cystectomy on ovarian reserve: a systematic review

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During the last 2 decades, laparoscopy has gained ground in the operative field for the treatment of benign diseases, and today it is thought to be the gold standard for the excision of nonmalignant ovarian cysts.¹ The procedure briefly includes stripping of the ovarian cyst wall, which is followed by appropriate hemostasis by means of bipolar electrocoagulation or simple suturing of the residual ovarian parenchyma. Certain studies have suggested that surgical excision of ovarian cysts and specifically of endometriomas may have a negative impact on ovarian reserve.^{2,3} This observation could be partly explained from inadvertently removed healthy ovarian tissue after excision of endometriomas and other benign ovarian cysts.⁴

Several noninvasive markers have been proposed to assess the ovarian reserve including the serum levels of follicle-stimulating hormone (FSH), serum anti-Müllerian hormone (AMH), luteinizing hormone, estradiol, the luteinizing hormone/FSH ratio, and inhibin B, and sonographic variables such as the mean

The aim of the present systematic review was to study the effect of bipolar electrocoagulation during ovarian cystectomy on ovarian reserve. We searched Medline (1966–2015), Scopus (2004–2015), ClinicalTrials.gov (2008–2015), and Cochrane Central Register (CENTRAL) databases along with reference lists of electronically retrieved studies. The levels of antimüllerian hormone (AMH) and antral follicle count (AFC) at 1, 3, 6, and 12 months following the excision of the benign ovarian cyst were defined as primary outcomes. Eight studies were finally included in our systematic review, which recruited 545 women. A metaanalysis was precluded because of significant heterogeneity in the methodological characteristics of the included studies. Data from the included studies suggest that the use of bipolar coagulation compared with ovarian sutures seems to result in significantly lower AMH and AFC during the first 3 months following the excision of the ovarian cyst. Two studies reported that this effect seems to persist at 6 and 12 months postoperatively. Bipolar electrodiathermy seems to be accompanied by increased damage to ovarian reserve, which is indicated by the lower levels of AMH and AFC. However, definitive results are precluded because of the significant heterogeneity of included studies and the potential bias.

Key words: antimüllerian hormone, antral follicle count, bipolar, cystectomy, follicle-stimulating hormone

ovarian diameter, the ovarian volume, the antral follicle count (AFC), and the peak systolic velocity (PSV) of the ovarian artery.⁵ Among them the most sensitive seem to be AMH and AFC.⁶

Until today it is not known whether the negative effect of cyst excision on ovarian reserve is exerted through the application of bipolar electrocoagulation, which may potentially destroy the oocytes. The purpose of the present systematic review was to compare bipolar electrocoagulation with ovarian sutures and study its effect on ovarian reserve and fertility outcomes.

Materials and methods

Study design

The present study was designed according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines.⁷ Eligibility criteria were predetermined by the authors. All

prospective and retrospective observational cohort studies that reported treatment outcomes and adverse effects related to bipolar electrocoagulation vs ovarian suture during laparoscopic ovarian cystectomy were included in the present systematic review. Case reports, reviews, and animal studies were excluded. In cases in which data from a particular study sample appeared in more than 1 publication, the article with the most complete follow-up data was used. No language restrictions were used. Any discrepancies between the authors during data collection were resolved by the consensus of all authors.

Literature search and data collection

We systematically searched the literature using the Medline (1966–2015), Scopus (2004–2015), ClinicalTrials.gov (2008–2015), and Cochrane Central Register (CENTRAL) databases as well as

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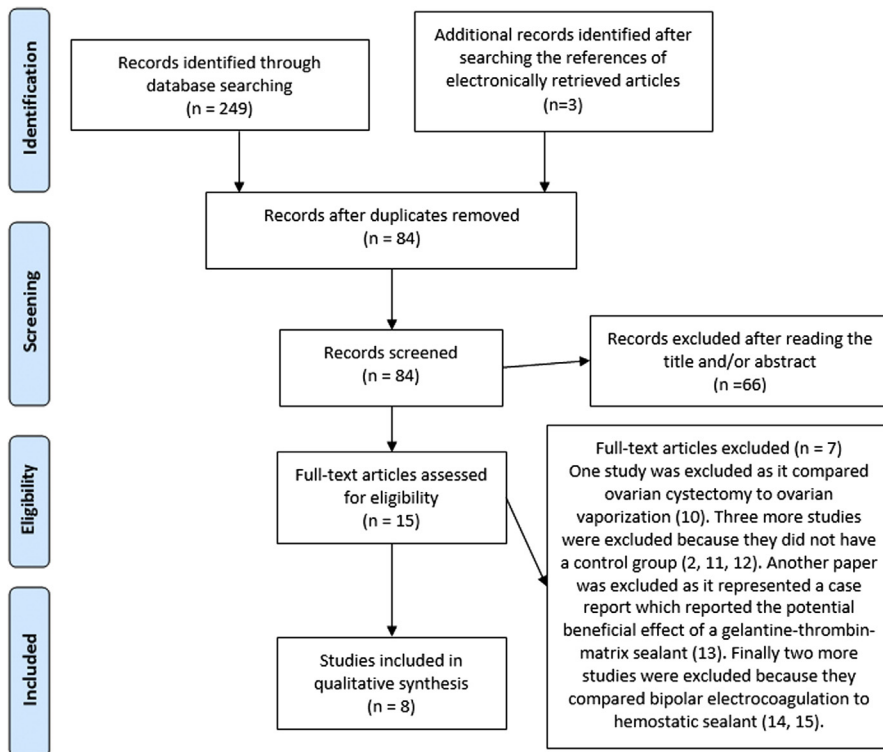
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FIGURE 1
Search plot

Pergialiotis. Bipolar coagulation and ovarian reserve. *Am J Obstet Gynecol* 2015.

(blood coagulation [MeSH terms] or (blood [All Fields] and coagulation [All Fields]) or blood coagulation [All Fields] or coagulation [All Fields] or blood coagulation tests [MeSH terms] or (blood [All Fields] and coagulation [All Fields] and tests [All Fields]) or (blood coagulation tests [All Fields]) and FSH [All Fields]).

We also used the terms (blood coagulation [MeSH terms]) or (blood [All Fields] and coagulation [All Fields]) or blood coagulation [All Fields] or coagulation [All Fields] or blood coagulation tests [MeSH terms] or (blood [All Fields] and coagulation [All Fields] and tests [All Fields]) or (blood coagulation tests [All Fields]) and AMH [All Fields] and the terms (blood coagulation [MeSH terms]) or (blood [All Fields] and coagulation [All Fields]) or (blood coagulation [All Fields] or coagulation [All Fields] or blood coagulation tests [MeSH terms]) or (blood [All Fields] and coagulation [All Fields] and tests [All Fields]) or (blood coagulation tests [All Fields]) and (ovarian reserve [MeSH terms]) or (ovarian [All Fields] and reserve [All Fields]) or (ovarian reserve [All Fields]).

Our search strategy is presented in Figure 1.

Quality assessment

We assessed the methodological quality of all included studies using the Oxford Level of Evidence criteria and the GRADE (Grading of Recommendations Assessment, Development and Evaluation) list.^{8,9} The methodological quality of included randomized controlled trials was also assessed according to the modified Jadad scale using the following criteria: description of the studies as randomized along with details of randomization, description of the studies as double blind, details of the double-blinding procedure, information on withdrawals, and allocation concealment (Figure 2).¹⁰

Definitions

The levels of AMH, the AFC at 1, 3, 6 and 12 months following the excision of the benign ovarian cyst and the pregnancy rates were predefined as main outcomes. The serum postoperative

the references of the electronically retrieved articles.

Our search strategy included the words bipolar, coagulation, suture, ovarian reserve, AMH, and FSH. We

specifically searched PubMed using the MeSH terms (bipolar [All Fields] and (ovarian reserve [MeSH terms] or (ovarian [All Fields] and reserve [All Fields]) or ovarian reserve [All Fields]),

FIGURE 2
Jadad score of included RCTs

	2009; Li	2011; Mohamed	2011; Coric	2011; Ozgonen	2012; Simone-Ferrero
Was the study described as random?	+	+	+	+	+
Was the randomization scheme described and appropriate?	+	+	+	+	+
Was the study described as double-blind?	-	-	+	-	-
Was the method of double blinding appropriate?	-	-	+	-	-
Was there a description of dropouts and withdrawals?	-	-	+	-	+
Overall Jadad Score	2	2	5	2	3

RCT, randomized trial.

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