

Review article

# The effects of acupuncture on polycystic ovary syndrome: A systematic review and meta-analysis<sup>☆</sup>

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## Abstract

**Introduction:** A systematic review and meta-analysis was carried out to assess the clinical effectiveness of acupuncture in treating polycystic ovarian syndrome (PCOS).

**Methods:** RCTs that compared either acupuncture with no/sham (placebo) acupuncture or a certain therapy with acupuncture added in the treatment of PCOS were included in the review. Measures of treatment effectiveness were the pooled odds ratios (OR) for women with PCOS having acupuncture compared with women in the control group for the recovery of menstrual cycles, standardized mean difference (SMD) for body mass index (BMI), fasting insulin (FINS), fasting plasma glucose (FPG), luteinizing hormone (LH), follicle stimulating hormone (FSH), and the ratio of LH/FSH.

**Results:** A total of nine RCTs (531 women) met criteria for inclusion into the systematic review. Using the random effects model, pooling of the effect estimates from all RCTs showed recovery of menstrual cycles (OR = 0.20, 95% CI: 0.09–0.41,  $P < 0.01$ ), BMI (SMD = -0.63, 95% CI: -1.04 to -0.21,  $P = 0.04$ ), and LH (SMD = -0.39, 95% CI: -0.65 to -0.12,  $P < 0.01$ ) which favored the acupuncture group. No significant differences were observed for FINS, FPG, FSH and the ratio of LH/FSH between acupuncture and control groups ( $P > 0.05$ ).

**Conclusions:** Acupuncture appears to significantly improve the recovery of the menstrual cycles and decrease the levels of BMI and LH in women with PCOS. However, the findings should be interpreted with caution due to the limited methodological quality of included RCTs.

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**Keywords:** Acupuncture; Polycystic ovary syndrome (PCOS); Menstrual cycle; Systematic review; Meta-analysis

## 1. Introduction

Polycystic ovary syndrome (PCOS) is recognized as one of the most common endocrine and metabolic disorders in women, and has a prevalence of 6–15% in reproductive-aged women [1,2]. PCOS patients often need pharmacological treatment over a long period of time [3,4]. Although oral contraceptives are the most common therapy to effectively alleviate hirsutism and

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acne in patients with PCOS, they can adversely affect glucose tolerance, coagulability and fertility [5].

Acupuncture, through stimulating specific points on the body, has been used to treat gynecological disorders for thousands of years [6]. Acupuncture is sometimes chosen by women with PCOS as an alternative to pharmacotherapy, with some choosing to use it as an adjunct while undergoing infertility treatment [7]. This systematic review and meta-analysis of the available literature assesses the effectiveness of acupuncture for the treatment of PCOS.

## 2. Methods

### 2.1. Eligibility criteria

Randomized controlled trials (RCTs) comparing either acupuncture with no/sham (placebo) acupuncture or a therapies with acupuncture added in to the treatment of PCOS were included. “Acupuncture” was defined as traditional needling, auricular acupuncture, electro-acupuncture (EA), auricular acupressure, or warm needling acupuncture. PCOS was diagnosed according to the European Society for Human Reproduction and Embryology (ESHRE) and American Society for Reproductive Medicine (ASRM) sponsored PCOS Consensus Workshop criteria (the Rotterdam criteria) [8]. For inclusion, at least one of the following outcomes had to be available for extraction: recovery of menstrual cycles, body mass index (BMI), fasting insulin (FINS), fasting plasma glucose (FPG), luteinizing hormone (LH), follicle stimulating hormone (FSH), the ratio of LH/FSH and testosterone (T). The numbers of events, participants in each group, mean and standard deviation (SD) for continuous data had to be clearly defined. Case reports, reviews, animal experiments, non-randomized controlled trials and studies comparing the combination of acupuncture and another therapy with a third therapy were excluded.

### 2.2. Search strategy

A systematic literature search was performed using the following databases: MEDLINE, EMBASE, SCISEARCH, the Cochrane Menstrual Disorders and Subfertility Group trials register, China Academic Journal Electronic full text Database in China National Knowledge Infrastructure, Wanfang Database, Index to Chinese Periodical Literature, and the International Standard Randomized Controlled Trial Number (ISRCTN) Register and meta-register for randomized controlled trials (mRCT). All the databases were searched from their inception to May 2015. The reference lists of the relevant primary and review articles were examined to identify cited articles that were not captured by electronic searches. No restrictions of language or publication type were placed on the searches.

The following keywords were searched: “polycystic ovary syndrome” or “polycystic ovary” or “ovary polycystic disease” or “PCOS” or “polycystic ovary morphology” or “oligoamenorrhea” or “oligoamenorrhea” or “oligoanovulatory” or “oligohypomenorrhea” or “amenorrhea” or “amenorrhoea” or “hirsutism” AND “acupoint” or “acupressure” or “acupressure-acupuncture therapy” or “acupuncture” or “electro-acupuncture” or “electroacupuncture” or “moxibustion” or “Tui Na” or “traditional medicine” or “traditional Chinese medicine” or “traditional Chinese medicine combined with western medicine”. All search terms were back translated into Chinese terms in order to conduct the searches in Chinese databases.

### 2.3. Study selection

Two reviewers independently scrutinized titles and abstracts from the electronic searches (F.Q. and Y.W.), and full manuscripts of all citations that were likely to meet the pre-defined inclusion criteria were obtained. The final inclusion or exclusion decisions were made on examination of the full manuscripts. In cases of duplicate publication, the most recent

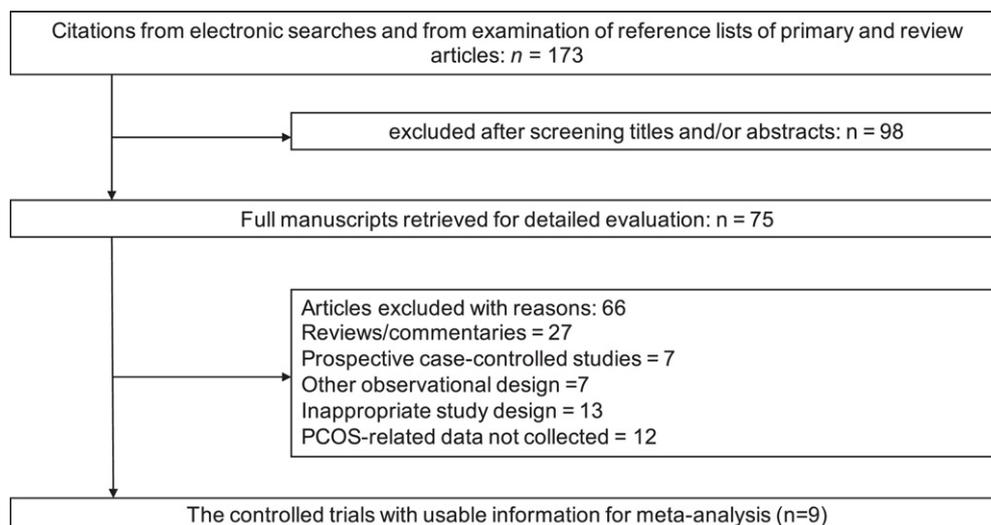


Fig. 1. The process of study selection for the systematic review with meta-analysis of the effects of acupuncture on polycystic ovary syndrome.

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