Review

Efficacy of fire-needle for acne: a systematic review and meta-analysis of randomized controlled trials*

火针治疗痤疮有效性的系统评价及meta分析*

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* Supported by National Basic Research Program of China (973 program): 2012CB518504 and Guangdong Administration of TCM Research Foundation: 20151233

ABSTRACT

Objective To evaluate the efficacy of fire-needle therapy for acne to provide an objective basis for clinical decisions. **Method** PubMed, Chinese Biomedical Medicine disc (CBM), Chinese National knowledge infrastructure (CNKI), and *Wanfang* database were searched to include eligible randomized controlled trails. Bias risk was assessed and data were extracted. Meta-analysis was performed and as was subgroup analysis. **Results** Thirty-three RCTs involving 3362 patients were included. Most of them had a high risk or unclear risk of bias regarding allocation concealment, incomplete outcome data and selective reporting. Compared with control groups, meta-analysis revealed that fire-needle therapy had an overall higher total effectiveness rate (*RR*=1.19, 95% CI: 1.16–1.22, *P*<0.000 01). Subgroup analysis showed fire-needle therapy was associated with an increased total effective rate (*RR*=1.20, 95%CI: 1.14–1.28, *P*<0.000 01), when compared against drug therapy. Fire-Needle therapy was associated with an increased total effective rate (*RR*=1.18, 95%CI: 1.12–1.24, *P*<0.000 01), when fire-needle plus other TCM therapy was compared against other therapy. fire-needle therapy was associated with an increased total effective rate (*RR*=1.18, 95%CI: 1.13–1.24, *P*<0.000 01), when fire-needle plus Chinese herb therapy was compared against Chinese herb therapy alone. fire-needle therapy was associated with an increased total effective rate (*RR*=1.28, 95%CI: 1.18–1.39, *P*<0.000 01), when compared fire-needle plus Western drug therapy against western drug therapy alone. Adverse events were not reported in most articles. **Conclusion** Our study showed that fire-needle appears to be an effective therapy for treating acne, but the evidence is currently insufficient due to the poor quality of the studies. The safety of fire-needle therapy is also uncertain due to the small sample size and the lack of reporting in included articles. Larger sample, higher quality studies are needed.

KEY WORDS: fire-needle; acne; systematic reviews; meta-analysis

INTRODUCTION

Acne is a kind of chronic inflammation of the hair follicle and sebaceous gland commonly seen in young people during puberty[1]. While it may be regarded as a normal expression of adolescence, it may get out of control and be a source of emotional distress, disrupting the life of those effected. Acne may proceed into adulthood, affecting roughly 33% of people between the ages of 15 and 44 years of age[2],

or affects nearly 80% of adolescents and young adults aged 11 to 30 years at some point[3].

One or more factors have been implicated in the pathogenesis of acne in western medicine [4]. Therapies include topical or systemic agents, phototherapy narrowband light (blue or red), and acne vaccines are currently being used[5-7]. Chapped lips, xerosis, burning, erythema are common side effects.

Due to a lack of response to western medical treatment or concerns about side effects, a number of patients prefer to use traditional Chinese medicine[8]. Fire-needle is a therapy used to treat diseases in TCM. In this therapy, the needle is heated in a flame until incandescent and then inserted into the human body. It's widely used in TCM to treat skin diseases such as acne, eczema, etc.

Many studies on this topic have been published, but the results remain unclear. We have conducted this systematic review and meta-analysis of randomized controlled trials to compare the efficacy of fire-needle with other therapies for acne.

MATERIALS AND METHODS

Literature search

PubMed, Chinese Biomedical Database (CBM), Chinese National knowledge infrastructure (CNKI), and *Wanfang* database were searched from their respective inception dates (PubMed 1948, CBM 1978, CNKI 1996, *Wanfang* database 1998) through February 1, 2016 using the following search strategy.

English 1. fire-needle, 2. heated needle, 3. acne, 4. #1 OR #2, 5. #3 OR #4, 6. #4 AND #5

Chinese 1. 火针, 2. 毫火针, 3. 痤疮, 4. #1 OR #2, 5. #4 AND #3

Intervention

Experimental group: patients treated with fire-needle combined with acupuncture, fire-needle combined with electroacupuncture, fire-needle combined with moxibustion, fire-needle combined with herb, fire-needle combined with cupping, etc.

Control group: patients treated with western medicine, acupuncture, none-intervention, or herbal medicine.

Inclusion criteria

This study included research articles published in Chinese or English which describe the effect of fire-needle (with or without TCM therapy) on acne in humans. Overview articles, and studies investigating fire-needle related techniques were excluded.

Articles selection

Two reviewers (LUO Xiao-zhou, LI Ke-song) independently assessed the articles retrieved from the literature search for relevance by title and abstract in the first step. In the second screening step, full texts of all remaining articles were obtained and screened for qualification by two reviewers (ZHANG Bin, TANG Chun-zhi) independently. If the reviewers had doubts or disagreements, the full text would be obtained and evaluated by all authors. Discussion and consensus would resolve the remaining disagreements.

Quality assessment

Two investigators (LI Ke-song, ZHANG Bin) evaluated the quality of each included study independently based on these factors: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other bias. Risk of bias was assessed by *Cochrane handbook* for systematic reviews of interventions. A value of 'high risk of bias'(No),'low risk of bias'(Yes) or 'lack of information or uncertainty over the potential for bias'(Unclear) was given for each study.

Statistical analysis

All dates were analyzed by RevMan 5.3 Dichotomous outcomes were evaluated by relative risks and 95% confidence intervals with $P<0.05$ as significant level. Depending on the details, fixed effects or random effects were used. Heterogeneity was assessed using the I^2 statistic and $I^2>50\%$ as significant heterogeneity. If heterogeneity was observed, a subgroup analysis was performed to explore the sources of it.

RESULTS

Article selection

Three hundred and seventeen potential studies were identified, 186 articles were excluded based on the title or abstract. Only 131 studies were obtained for further review. Thirty studies were excluded because they were not randomized controlled trials: 4 single case studies, 23 review articles, and 3 animal studies were excluded. Sixty-eight articles were excluded for other reasons: 66 for mixed interventions, 2 for