INPLASY PROTOCOL

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None declared.

Traditional Herbal Medicine for Recurrent Urinary Tract Infection: Meta-Analysis of Randomized Controlled Trials

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Review question / Objective: **P: patients with recurrent UTI; I: receiving traditional herbal medicine treatment; C: receiving antibiotics or placebo treatment; O: recurrent rate of UTI.**
Condition being studied: **Urinary tract infection (UTI) is a common disease in the world. Individual factors contribute to the incidence of UTI or cystitis including genetic factors, behavioral risk factors, and biological factors]. The majority cause for women having a higher risk of recurrent UTI or simple cystitis includes the anatomical structure of the urethra which is much shorter in females than that in males. Bladder outlet obstruction caused by prostatic enlargement is the primary mechanism that boosts the initiation of UTI in men of elderly age. A high prevalence not only develops a health issue prone to relapsing but also costs a lot of medical resources. UTI patients who experienced clinical cures also had significantly better quality-of-life scales (QOLS) than those who experienced failed treatments. Consequently, effective treatment and prevention of recurrent UTI that lower the economic burden of the health care system become a priority task.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 08 October 2022 and was last updated on 08 October 2022 (registration number INPLASY2022100031).

INTRODUCTION

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is much shorter in females than that in males. Bladder outlet obstruction caused by prostatic enlargement is the primary mechanism that boosts the initiation of UTI in men of elderly age. A high prevalence not only develops a health issue prone to relapsing but also costs a lot of medical resources. UTI patients who experienced clinical cures also had significantly better quality-of-life scales (QOLS) than those who experienced failed treatments. Consequently, effective treatment and prevention of recurrent UTI that lower the economic burden of the health care system become a priority task.

METHODS

Participant or population: Patients with recurrent UTI.

Intervention: Receiving traditional herbal medicine treatment.

Comparator: Receiving antibiotics or placebo treatment.

Study designs to be included: Randomized controlled trials

Eligibility criteria: Reported sufficient recurrence rate or numbers data.

Information sources: Electronic databases were searched for randomized control studies eligible for meta-analysis including PubMed, Medline, Cochrane Library, Google scholar, and China National Knowledge Infrastructure (CNKI). The publication date of the articles was limited to before December 2021. Literature confined to controlled clinical trials, and other experiments including non-human studies, congress reports, or study protocols were excluded. The language was restricted to English as well as Chinese.

Main outcome(s): There were 215 articles identified from the literature search for the meta-analysis. By the initial search for the eligible articles, 11 duplicates, 154 non-clinical trials, and two non-English or Chinese articles were excluded. There was a total of 48 articles that remained and were screened by the inclusion criteria. The review papers, study protocols, and congress reports were not involved in this meta-analysis. Additionally, there were three articles were removed because the interventions were only acupuncture and massage that did not use any herbal medicine. The main purpose of the study was to analyze the recurrent rate of urinary tract infections between traditional herbal medicine and other conventional treatments. The effect sizes for each identified study were expressed as odds ratios with 95% confidence intervals (CI) where a value less than one indicates fewer recurrent events in treating UTI. The results of the included studies were pooled by a random-effects model, where the significance of the pooled odds ratio was determined by the z-test.

Additional outcome(s): The frequently used herbal medicines in interventions are further investigated.

Quality assessment / Risk of bias analysis: To survey the statistical power of the effect of herbal medicine treatment versus conventional treatment on RUTI, the odds ratio (OR) with 95% confidence intervals (CI) was calculated using per protocol analysis for every study. The I2 statistic was to figure out whether the results were homogeneous or not, and the heterogeneity was analyzed by Q statistics and related p-value. The I2 value is expressed by the percentage of the variability and is defined as a low, medium, and high levels of heterogeneity corresponding to the number of 25%, 50%, and 75%. A systemic difference among the selected studies might lead to the failure of the assumption of homogeneity. Egger's linear regression was executed to verify publication bias. Furthermore, meta-regression was conducted simultaneously by using the unrestricted maximum likelihood method to identify whether sex distribution, age, disease duration, treatment period, or follow-up period of the included studies would influence the effect size. Statistical analyses for the meta-analysis were performed by using

Comprehensive Meta-Analysis software, version 3 (Biostat, Englewood, NJ, USA). Statistical significance would be defined as p-values less than 0.05.

Strategy of data synthesis: The main purpose of the study was to analyze the recurrent rate of urinary tract infections between traditional herbal medicine and other conventional treatments. The effect sizes for each identified study were expressed as odds ratios with 95% confidence intervals (CI) where a value less than one indicates fewer recurrent events in treating UTI. The results of the included studies were pooled by a random-effects model, where the significance of the pooled odds ratio was determined by the z-test. In order to conduct whether any individual study was responsible for the significant result, sensitivity analysis was assessed for the impact on study findings, and significance was evaluated individually after each study was removed.

Subgroup analysis: Meta-regression was conducted simultaneously by using the unrestricted maximum likelihood method to identify whether sex distribution, age, disease duration, treatment period, or follow-up period of the included studies would influence the effect size. Statistical analyses for the meta-analysis were performed by using Comprehensive Meta-Analysis software, version 3 (Biostat, Englewood, NJ, USA).

Sensitivity analysis: Sensitivity analysis assessed the impact on study findings, and significance is to be evaluated individually after each study was removed.

Language restriction: English and Chinese.

Country(ies) involved: Taiwan.

Keywords: recurrent urinary tract infection; traditional herbal medicine; antibiotics.

Contributions of each author:
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