



REVIEW OF CHINESE HERBAL MEDICINE IN THE TREATMENT OF TYPE 2 DIABETES

HONOURS DEGREE OF BACHELOR HEALTH SCIENCE



In

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ABSTRACT

Background

Diabetes affects 422 million people and directly causes 4.9 million deaths according to global report on diabetes in 2014. By 2030, diabetes will be the 7th leading cause of death based on WHO prediction. Type 2 diabetes accounts for 90% of people with diabetes around the world. Diabetes has been recognised since ancient times and Chinese herbal medicine has been used to treat diabetes for more than 2000 years in China. An increasing number of people all over the world are trying to manage type 2 diabetes with Chinese herbal medicine. Many clinical studies have been performed and published inside China that show Chinese herbal medicine can be an effective and safe treatment for type 2 diabetes, but there are very limited clinical studies available outside China in English that report type 2 diabetes treatment with Chinese herbal medicine.

Objectives

To report the effectiveness and safety and evaluate the quality of the evidence of Chinese herbal medicine for the treatment of patients with type 2 diabetes mellitus.

Search methods

The following resources were searched for the identification of trials from 2004 to 2015: The Cochrane Library (Wiley Online Library), Web of Science, PubMed, Google Scholar, The University of Adelaide Library Research, China Academic Journals Full-text Database (Basic Search) and Heart & diabetes Institute (Baker IDI). National Resource Centre for Chinese Materia Medica and China Academy of Chinese Medical Sciences have been contacted for relevant studies. Reference lists of relevant trials and reviews were searched for potential eligible studies. Authors of relevant identified studies and experts were contacted to obtain additional references.

Selection criteria

Randomised controlled clinical trials with full text in English or Chinese and a minimum treatment period of eight weeks, comparing Chinese herbal medicine (alone or combined with other pharmaceuticals or other interventions) with other pharmaceutical, placebo, or other interventions (mainly diet control and exercise therapy) as treatments for type 2 diabetes. Quasi-randomised controlled trials, cluster-randomised trials and other non-randomised controlled trials such as cohort studies, case control studies, case series and case reports were not eligible for inclusion in this review. Pre-diabetes, type 2 diabetes complications, study of herb extracts, study of Chinese herb combined with acupuncture and tuina

treatment, comparison of different forms of Chinese herbs and study duration less than eight weeks were also excluded in this review.

Data collection and analysis

All studies for inclusion were assessed and extracted in Characteristics of included studies by using standard data extraction templates. Risks of bias were evaluated based on the *Cochrane Handbook for Systematic Review of Intervention*. The key criteria of random sequence generation, allocation concealment, blinding of participants, incomplete outcome data, and selection reporting and other bias in the trials were assessed. Any questions were resolved by discussion with two research supervisors and/ or referring back to the original article.

Main results

Fifty-eight randomized clinical trials (involving 6637 type 2 diabetes patients) were included in this review. The trials compared Chinese herbal medicines either in combination with other pharmaceuticals (forty-two trials) or alone (ten trials) versus other pharmaceuticals alone or placebo (four trials). Two studies compared among three groups, one of the studies compared Chinese herbal medicine combined with other pharmaceuticals versus Chinese herbal medicine alone versus other pharmaceuticals alone. Another study compared Chinese herbal medicine alone versus pharmaceutical alone versus other interventions (mainly diet control and exercise therapy).

Most trials tested various Chinese herbal medicines including individual prescriptions modified from classical formulae. Three trials only tested a single Chinese herb Huanglian (*Coptidis Rhizoma*) or Wuweizi (*Fructus Schisandrae*). Pharmaceuticals included commonly used hypoglycemic Western medicines such as metformin, sulfonylurea (glibenclamide, glimepiride, and glipizide), alpha-glucosidase inhibitor (acarbose), thiazolidinediones (rosiglitazone), and insulin etc. Other interventions mainly included diet control, exercise therapy, diabetes health education and other life style changes.

The overall methodological quality in included studies was unsatisfactory. The studies were well-designed, but most studies were not reported correctly, affecting the quality of evidence. Thus, the 'Risk of bias' domains were assessed as unclear risk in about two-thirds of the included trials due to insufficient detail to allow a definite judgement.

The most valuable and important comparison to evaluate the treatment of type 2 diabetes with Chinese herbal medicine is with placebo, and only four trials were available in this review. Three studies were performed in multiple centres (2, 10 and 20) with one study including one centre outside of China. One study were randomised controlled trials with two arms.

Based on available information, Chinese herbal medicines used alone or in combination with other Western hypoglycemic agents or lifestyle changes were associated with a decrease of glycated haemoglobin and blood glucose (FBG & 2h PBG), blood lipid profiles (TC, TG, LDL-C & HDL-C), weight or body mass index (BMI) and TCM clinical symptom score (which is a method of evaluating the symptoms of diabetes including dry throat and mouth, lack of strength, polyphagia, polydipsia, polyuria, shortness of breath, vexing heat in the chest, palms and soles, palpitation, insomnia etc.). A combination of Chinese herbal medicines with either other pharmaceuticals or lifestyle interventions was also associated with enhancing the therapeutic effects of other pharmaceutical by improving insulin sensitivity (HOMA-IR or ISI) in the treatment of type 2 diabetes. However, the overall evidence for effectiveness was insufficient because the studies were not reported correctly and the quality of literature in included studies was unsatisfactory.

Less than half of the studies (22/58) reported adverse effects of the interventions with only one-third of the studies (19/58) providing detailed information of safety assessment, and certainly had no safety assessment comparable with western medicines. So there was very limited safety data to conclude that Chinese herbal medicines were safe for type 2 diabetes treatment based on available information.

Author's conclusions

The evidence to assess the effectiveness of Chinese herbal medicine for treating type 2 diabetes was acceptable in principle (fifty-eight trials with large sample size and forty-two with brief information of randomization), but the risks of bias (uniform bias due to patients selection exclusively from TCM hospitals or patients) in most of the included studies precluded a determination with respect to the effectiveness of Chinese herbal medicine. There was also insufficient data to evaluate safety issues in most of the trials if considering long-term adverse effects of Chinese herbal medicines. (Only less than half of the studies provide information of adverse effects and most of them were performed with short durations of 8 or 12 weeks).

There was limited data (four studies) to compare the effectiveness of Chinese medicine (either alone or in combination with Western medicine) with placebo. From available data, Chinese herbal medicines combined with pharmaceuticals or alone may be more effective than pharmaceutical alone at glycemic control, insulin resistance control and improvement of TCM clinical syndromes. However, the information provided by most of the studies was insufficient with respect to details to allow a definite judgement of risk of bias, which affected the evaluation of overall methodological qualities of included studies.

High quality studies (Long-term well-designed studies with multiple centres and large samples) with sufficient described details about randomisation methods and safety tests are required to compare

Chinese herbal medicine alone with pharmaceutical alone or placebo before any conclusions can be drawn about the effectiveness and safety of type 2 diabetes treatment with Chinese herbal medicines.