

# Can traditional Chinese medicine formulas treat BMI-associated hypertension effectively?

## Abstract

The tradition of Chinese Medicine (TCM) has been in use and development for thousands of years, where it has been applied in some form for the treatment of nearly every common illness. TCM is currently undergoing a resurgence in interest and in providing an adjunct to allopathic medical care virtually worldwide. TCM therapeutics may be administered in many forms from capsules, to powders, homogenates, tinctures and decoctions. Si Wu Tang, a derivative of the traditional Chinese including Formulas, is a combination of substances that may function in a synergistic manner to promote a calming effect and an amelioration of symptoms of hypertension. Such formulas are often used in TCM to treat or alleviate a wide range of the common illness and disorders of both Eastern and Western society. Reported beneficial effects include improvements in circulatory, cardiovascular, mood, endocrine metabolic and reproductive disorders. One such TCM formula commonly recommended is the Wu Cao Si Wu Tang [SWT] formula, used to treat the hypertension of obesity and a variety of other disorders. Hypertension is a key risk factor for cardiovascular morbidity and mortality and is a leading cause of end-stage renal disease; over 7 million US deaths per year may be directly attributed to pathophysiologic complications resulting from poor control of blood pressure. While numerous advances in the diagnosis and treatment of hypertension have had a major impact on decreasing the overall risks and an improved management of this chronic disease, a definitive cure for all causes of hypertension has remained elusive to date. To determine the comparative effectiveness of conventional Western treatment vs. drug free Traditional Oriental Therapy for hypertension, we reviewed the data from independent studies. Wu Cao Si Wu Tang was found to be as effective as allopathic medications in controlling blood pressure in a group of moderately hypertensive patients.

**Keywords:** hypertension, pathophysiologic complications, homogenates, tinctures

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## Introduction

Hypertension is a leading cause of end-stage renal disease in normal weight and overweight individuals and a key risk factor for cardiovascular morbidity and mortality worldwide, and over 7 million US deaths per year have been directly attributed to pathophysiologic complications resulting from poor control of blood pressure.<sup>1-3</sup> Traditional Chinese Medicine [TCM] has been in use for thousands of years, dating back to at least 1766 B.C. when the written language first made its appearance during the Shang Dynasty and with distant historical references beyond written language.<sup>4</sup> TCM is developed almost exclusively around folklore and the reported pharmacotherapeutic effects of natural products, including herbal and other products of plant origin. The origins of allopathic medicine are also rooted in the pharmacognosy of natural products, with at least 200 pharmaceuticals having been developed by extracting the active principles from their naturally occurring species especially those of plant origins.<sup>5</sup> The Tao-Hong-Si-Wu-Tang (THSWT)<sup>6</sup> and Wu Cao Si Wu Tang (SWT)<sup>7,8</sup> combinations are famous traditional Chinese herbal medicine formulae, which have traditionally been used in China for a variety of illnesses and maladies for about one thousand years.<sup>4</sup> As with many herbal remedies used in folklore, not all of the ingredients are well documented, and not all have been subjected to detailed scientifically controlled clinical trials that could prove or disprove the purported benefits. The THSWT and SWT formulas are defined qualitatively, however, and consist of specific combinations of ingredients and prepared traditionally via defined methodologies.

The THSWT mainly consists of six plant materials: Shu Di Huang (*Rehmannia glutinosa* Liboschitz), Bai Shao (*Paeonia*

*lactiflora* Pallas), Dang Gui (*Angelica sinensis* (Oliv.) Diels), Chuan Xiong (*Ligusticum chuanxiong* Hort.), Tao Ren (*Prunus persica* (L.) Batsch.), and Hong Hua (*Carthamus tinctorius* L.),<sup>6</sup> while the SWT formula<sup>7</sup> consists of four herb units: Rx. Rehmannia, Rx. Paeoniae Alba, Rx. Angelicae Sinensis and Rz. Chuanxiong. Each SWT ingredient has been attributed to impart synergistically beneficial complimentary antihypertensive and other physiologic effects when administered in the prescribed combination. Both of the above formulas have long been employed clinically in TCM to promote blood circulation, to relieve women's irregular menses disorders, and have also been used to treat immunological disorders, migraine, mood disorders and cardiovascular diseases such as hypertension and angina.<sup>6-8</sup> Furthermore, because they have been reported to increase blood flow of the microcirculation the formula has been reported to provide beneficial effects in regulating diabetic neuropathies and remineralization of glucocorticoid-induced avascular necrosis of the femoral head.<sup>9</sup> In addition, THSWT has traditionally also been used as a folk remedy in the treatment of physical and mental fatigue in the southern part of China, and in recent animal studies has been shown to significantly improve physical endurance during exercise along with improvements in numerous biochemical parameters including exercise induced lactate accumulation, enhanced glycogen metabolism, and in improved nitrogen metabolism, thereby lending scientific credence to the actions claimed by folklore.<sup>10</sup>

An especially important form of dosage in TCM is the preparation of a decoction, which is known to bring about a more positive clinical impact due to the boiling method used in its preparation.<sup>7,8</sup> The improved clinical effects of decoctions are thought to be

due to the boiling method used in their preparation. The heat and moisture applied during the preparation of decoctions causes the plant fibers to swell and the combined heat and moisture facilitates the breakdown of the indigestible plant cell walls, thereby enabling a more effective extraction of the active principles from the plant sources. The improved extraction efficiency is attributed to producing a more effective tonic with greater efficiency of gastrointestinal absorption and systematic influence than if taken as fresh or dry plant residues. The extracted medicinal principles, mostly now in an aqueous or amphoteric solution, are more effectively absorbed via the small intestinal microvilli than if consumed in an unhomogenized, unextracted plant form. In the present study the SWT was prepared via boiling for 30 minutes, filtered to remove fibrous particulates and improve clarity, and the liquid product produced consumed each morning in its entirety as a pleasant tasting beverage.<sup>11</sup>

In conventional allopathic medicine, hypertension is treated via administering one or more established antihypertensive agents, individually or in combination therapy, with a goal of normalizing blood pressure toward 120/80 and body weights to a BMI of 30 or less.<sup>1-3,12,13</sup> Combination therapy often also includes dietary, exercise, and lifestyle modifications. Among the medications employed are angiotensin receptor blockers (ARBs), and calcium channel blockers to bring about vascular smooth muscle relaxation and resultant vascular dilation, and a dose related reduction of vascular resistance. Adrenergic Beta-blocker agents can also bring about decreases in the sympathetic tone of vascular smooth muscles with corresponding effects on blood pressure. In addition, addition of diuretics such as hydrochlorothiazide as monotherapy or in various combinations can bring about renal sodium and water excretion, corresponding decreases in blood volume and reduction of diastolic and systolic pressures. The clinical pharmacologic effects and clinical outcomes of all traditional antihypertensive agents used in allopathic medicine are well documented, as are some potential untoward side effects that may accompany their use and reduce patient compliance accordingly.<sup>12,13</sup> In the present review, the SWT regimen was administered, and systolic and diastolic blood pressures monitored periodically for 30 days or more to determine if normalization of blood pressure (BP) could be achieved and maintained in the absence of traditional pharmacologic agents. At the completion of the study, all participants achieved a normalization of a daily BP of 141/80 or less.

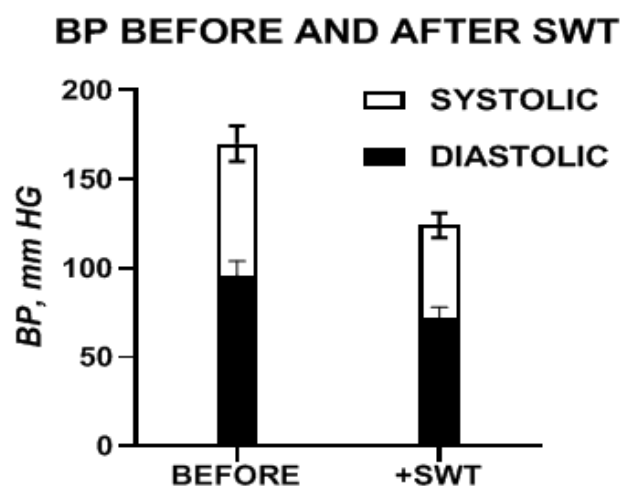
## Materials and methods

A total of 21 male and 9 female moderately hypertensive patients aged 30-67 years were selected retrospectively from the clinic data base for this review<sup>11</sup>. Patients were administered the SWT formula daily for up to 90 days, as the only variable examined. All patients reviewed had initial blood pressures in excess of 160/95 at the start of the observational period. All patients signed a consent form for their files to be reviewed and met the criterion of the Helsinki protocols for human subjects. A similar literature population of moderately hypertensive patients received conventional therapy to achieve and maintain blood pressures of less 140/90 for retrospective comparison. Periodic weekly blood pressure was monitored during the period of observation, to include monitoring of weight and vital signs and completion of a progress chart to record any untoward or remarkable side effects experienced or observed during progress of the treatment. Patients were instructed on the home preparation of the decoction regimen and provided the necessary cookware and utensils and the premixed dry formula constituents in sufficient quantities to complete the study. Briefly, premeasured quantities of the SWT formula was added to one liter of water, brought to a boil and kept steaming for 30

minutes. The decoction was then allowed to cool to room temperature, filtered with a common kitchen mesh filter to improve clarity and remove fibrous debris, and served with breakfast as a pleasant tasting beverage, comfortably warm or cold and without the addition of sweeteners, table salt or other condiments.

## Results and discussion

The prevention and antihypertensive therapy include multi-variables that cause or contribute to the development of hypertension and measures taken to normalize those variables. The research review is based on a review of the diagnosis and therapy of hypertension via conventional Western vs. Traditional Oriental medicine therapy.<sup>11</sup> Patients for allopathic comparison were administered the ARB Sartan [SR] or Xartan [XR] in the EU and Amlodipine [AD] in USA. For patients in China the Chinese oriental medicine Wu Cao Si Wu Tang [SWT] formula was administered daily for < 90 days or more in standardized therapeutic amounts. For the treatment of high blood pressure with the TCM/SWT protocol, 30 patients who presented with moderate hypertension [21 male and 9 female, age range 30-67 years old], with mean systolic pressure [SBP] of 160 mmHg or above, and the mean diastolic pressure [DBP] of 95 mmHg or greater upon admission to the study. All had no other serious comorbidities, and all had reported a negative history of known plant allergies.<sup>11</sup> The results of the SWT treatment are depicted in Figure 1 below and show the significant reductions in both diastolic and systolic blood pressure following 30 days of TCM treatment with the SWT preparation.



**Figure 1** Systolic and Diastolic Blood Pressure of participants. Data are mean  $\pm$  1 SD. Open bars depict systolic blood pressure, solid bars depict diastolic blood pressure, obtained with a standard blood pressure cuff and recorded to the nearest mm Hg.

Within one week of administering the TCM regimen, the BP of all subjects taking the SWT formula become normalized to SBP 141 or less and DBP of 90 or less and remained within the normal range for the remaining duration of the period of observations. The results were comparable to a similarly prepared mango leaf tea beverage (MLT), a preparation commonly used in the Caribbean and tropics where mango trees flourish.<sup>14-15</sup> Mango leaf tea extracts contain a broad range of bioactive constituents including Magniferin®, which has been shown to have rich antioxidant and vasoactive properties that can bring about free radical quenching and vascular smooth muscle relaxation, among numerous other health promoting benefits attributed to the preparation.<sup>15</sup> MLT consumption has long been used as a local remedy in the tropics for mild to moderate hypertension and has been observed to bring about reductions in BP from 160/95

or more and become normalized to 120/80 within the first week of treatment and remain normal thereafter.<sup>14,15</sup> In both the SWT and MLT preparations the volume of the nutraceutical-medicinal liquor was adjusted to approximately 1 liter of a warm, pleasant tasting beverage and consumed without sweeteners, salt, or condiments over a period of one hour or less in the morning hours.

In patients taking the SWT and the MLT preparations, no clinically untoward side effects were reported or observed during the course of these studies. In contrast, most allopathic hypertension medications list a broad range of possible side effects which may become significant enough to redefine a treatment program, or in some cases the patient may voluntarily discontinue the medications due to the initial side effects caused by the dosage. For patients consuming the MLT preparation, it is necessary to screen for poison ivy and poison oak allergies, presumed due to the common chemical urushiol found in mango skins and leaves, poison oak and in poison ivy which can cause a contact dermatitis.<sup>16</sup> Historically allergies to the SWT formula have not been reported, and the reports of MLT allergies are likewise infrequent in the Caribbean, likely due to the relative absence of the poison ivy plant species in the tropics where mango trees are abundant.

Complications from side effects during hypertension treatment with allopathic medications can be unpleasant and sometimes serious, and thus pose a potential concern and a need for patient education whenever treatment is indicated.<sup>13</sup> Common side effects of XR included blurred vision, that was reported to be disruptive for driving and reading by patients.<sup>11–13</sup> The AD side effects, which can be potentially life-threatening, included hives, swelling of the throat, and difficulty breathing. Thiazides and other diuretic agents that impede or block sodium reabsorption when taken in excess dosages can cause dehydration and mineral disturbances, secondary to both sodium and potassium loss, particularly the ‘loop’ diuretics. In contrast, the Wu Cao Si Wu Tang formula was found effective for uncomplicated moderate hypertension, and no side effects were observed or reported. Thus, the Wu Cao Si Wu Tang formula appears to be a worthy alternative to present day conventional Western approaches for the treatment of hypertension often associated with obesity and overweight conditions.

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## Conflicts of interest

Authors declare that there is no conflict of interest.

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## References

1. Kotchen, Theodore A. Obesity– Related Hypertension: epidemiology, pathophysiology, and clinical management. *American Journal of Hypertension*. 2010; 23:1170–1178.
2. Centers for Disease Control and Prevention. Chronic Kidney Disease Surveillance System website.
3. Buffet, Leticia, Ricchetti Charlotte. Chronic Kidney Disease and Hypertension: A Destructive Combination, *Regis University School of Pharmacy, Denver, Colorado US Pharm*. 2012;37(6):26–29.
4. Maciocia, Giovanni. The Foundations of Chinese Medicine: A Comprehensive Text for Acupuncturists and Herbalists; Churchill Livingstone; 1989. 26 p.
5. Dhami Namraj. Trends in Pharmacognosy: A modern science of natural medicines. *Journal of Herbal Medicine*. 2013;3(4):123–131
6. McDonald J, Penner J, Zang Fu. *Syndromes: Differential Diagnosis and Treatment*. 1999.
7. Lan Bu, Ou Dai, Fei Zhou, et al. Traditional Chinese medicine formulas, extracts, and compounds promote angiogenesis. *Biomed Pharmacother*. 2020;132:110855.
8. Huang H, Max M. *Ten Key Formula Families in Chinese Medicine*. 1st ed. 2009.
9. Chi–Ming Wu, Po–Chun Chen, Te–Mao Li, et al. Si–Wu–tang extract stimulates bone formation through PI3K/Akt/NF–κB signaling pathways in osteoblasts. *BMC Complement Altern Med*. 2013;13: 277.
10. Shan–shan Li, Zi–chao Chen, Chao–hui Zhang. Effect of Tao–Hong–Si–Wu–Tang, A Traditional Chinese Herbal Medicine Formula, on Physical Fatigue in Mice. *Afr J Tradit Complement Altern Med*. 2013;10(1):60–65.
11. Tulp OL, Chow T, Konyk CM, et al. Western Medicine vs Oriental Medicine in Hypertension Therapy. *Faseb J*. 2016;30(S1).
12. Yang Y, Ross J. Treatment principles and composition strategies. In: *Chinese Herbal Formulas*. 1st ed. 2010.
13. Michel T, Hoffman B. Treatment of Myocardial Ischemia and Hypertension. In: Goodman & Gilman, editors. 12<sup>th</sup> ed. 2011. p. 745–788.
14. Tulp OL, Gopal K. Personal communication, unpublished case report, USAT Montserrat; 2005.
15. Vascular effects of the *Mangifera indica* L. extract (Vimang).
16. Cruse Julius M, Lewis Robert E. *Atlas of Immunology; Second Edition*. CRC Press. 2003. 375 p.