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## Editorial

# Chinese Herbal Medicine and Cardiovascular Disease: Insights into the Integration of Ancient Medicines and Modern Approaches

Each year the AJTCVM features one of the five fundamental elements; in 2026, the Fire Element is honored, which is associated with the *Zang-fu* organ, the Heart. In Chinese medicine, the Heart is considered the supreme ruler, the "Monarch" of the *Zang-fu* organs; not only governing circulation of Blood and health of the vasculature through abundant Heart *Qi* and Blood, but consciousness and spiritual well-being by housing the *Shen* (mind, spirit). If the *Zang-fu* Heart is out of balance, all other organs are affected.

Traditional Chinese medicine (TCM) has treated what Western medicine defines as cardiovascular disease for millennia. While Chinese medicine practitioners used a different conceptual framework rooted in TCM, the clinical presentation associated with cardiovascular issues were identified, diagnosed, and treated for thousands of years. With the expanding integration of TCM, and in particular Chinese herbal medicine (CHM) with conventional medical treatment, the use of integrative medicine to address cardiovascular disease is gaining attention. Dr Erik Peterson of UT Southwestern Medical Center (Dallas Texas) recently led a large-scale study of 3777 patients. This randomized, double-blind, placebo-controlled, Western-style clinical trial (CS-AMI trial), investigated *Tongxinluo* (TXL), a Chinese herbal medicine approved in China since 1996 for angina and stroke. The study found TXL significantly improved outcomes for patients after a severe heart attack (STEMI). This study was published in the *Journal of the American Medical Association* and is considered a landmark, bringing rigorous scientific validation to a traditional Chinese herbal medicine.[1]

There is a growing interest in evaluating the mechanisms and safety of integrating these ancient medicines with conventional Western treatment. As the number of randomized controlled human clinical trials (RCTs) has increased, systematic reviews with meta-analyses have been conducted to more rigorously assess treatment effectiveness.[2-4] One review analyzed 55 RCTs (with modified Jadad scores above 4) involving over 36,261 patients to evaluate the efficacy and side effects of TCM in the treatment of cardiovascular disease.[2] The evidence from these RCTs showed that CHMs could lower blood pressure, reduce coronary artery events in patients with a history of myocardial infarction, and improve heart function in those with heart failure. Another systematic review compared outcomes of combining acupuncture and CHM with conventional treatments for heart failure versus using conventional therapies alone.[5] Out of 133 identified publications, eight RCTs met the inclusion criteria. Patients who received both conventional therapy and acupuncture/herbal medicine exhibited greater improvements in cardiac function and subjective quality of life than those receiving conventional medicine alone, with no significant adverse effects reported. The most commonly used Chinese herbs included *Huang Qi* (68.5%), *Dan Shen* (63%), *Fu Ling* (42.4%), *Gan Cao* (37%), and either *Gui Zhi* or *Ren Shen* at 37%. In this study, tonifying *Qi*/Blood herbs were used in 40% of patients, while Blood activating/Stasis dispelling herbs were used in 22%, and diuretic herbs in 8%.

Gong et al. reviewed 1,250 articles on TCM and coronary heart disease spanning 20 years, identifying 242 herbs mentioned 11,594 times.[6] They identified the 20 most frequently used herbs, led by *Dan Shen* (64%) followed by *Chuan Xiong* (Ligusticum), *Huang Qi* (Astragalus), *Dang Gui* (Angelica) and *Hong Hua* (Carthamus). The most prevalent herb attribute was "invigorate Blood", followed by herbs that tonify, regulate *Qi* flow, clear Heat, and resolve Phlegm. The authors noted variations in herb usage based on region, diseases treated, and historical changes, including a trend toward increased use of herbal formulas.

With ongoing research on the pathogenesis of cardiovascular disease, CHMs have shown unique therapeutic advantages by virtue of their chemical complexity, and multimodal effects. Increasing studies have demonstrated that CHMs exhibit a protective effect on the cardiovascular system.[7,8] Their therapeutic properties are primarily attributed to their active ingredients (e.g. polyphenols, flavonoids, polysaccharides, diterpenoids, phenolic acids, saponins) which provide cardioprotective benefits.[7,8] They act by balancing vasoactive factors and calcium, scavenging free radicals, promoting angiogenesis, and safeguarding mitochondrial functions to protect cardiomyocytes.[7] Several groups have reviewed and published current mechanisms of action for CHMs, determined through animal model studies, cell line work and clinical studies.[4,5,7-9]

Among CHMs to treat cardiovascular disease, the following stand out for documented therapeutic benefits and multifaceted mechanisms of action: *Dan Shen* (*Salvia miltiorrhiza*), *Huang Qi* (*Astragali radix*), *Ren Shen* (*Panax*

*ginseng*), *San Qi (Panax notoginseng)* and *Dang Gui* (*Angelica sinensis*).

*Dan Shen* (Salvia) has historically been used to invigorate and nourish Blood, resolve Stagnation, and calm the *Shen*. When used independently, *Dan Shen* has similar actions as the herbal formula *Si Wu Tang*. In China it is widely recognized for its efficacy in alleviating angina and improved electrocardiogram (EKG) readings. It is also used intravenously (*Danshen* injection) during hospitalization as a therapeutic agent for embolic stroke, myocardial infarction, and coronary artery disease. Western research indicates that *Dan Shen* enhances microvascular circulation, decreases reactive oxygen species (ROS) production, and provides cardioprotective effects against ischemia-reperfusion injury.[4] Its clinical effectiveness is largely attributed to its active constituents which include salvianolic acids, tanshinones and phenolics.[9] At the cellular level, *Dan Shen* benefits cardiovascular health by mitigating oxidative stress, reducing inflammation, improving blood flow, and inhibiting apoptosis in the heart; primarily through the activity of tanshinones and salvianolic acids which modulate signaling pathways such as PI3K/AKT and reduce inflammatory cytokines (e.g. TNF-α, IL-6). The herb additionally improves endothelial function, lowers blood viscosity, and promotes angiogenesis, thereby providing protection against ischemic injury and heart failure. Overall, *Dan Shen* demonstrates significant biological properties—namely anti-oxidative, anti-inflammatory, and anti-thrombotic actions—that support its use as an effective intervention for circulatory disorders.[7]

*Huang Qi* (Astragalus) has historically been used for *Qi* invigoration due to its tonic properties in strengthening biological tissues and promoting energy metabolism.[7] Astragaloside IV, its main active component, has notable antioxidant properties and inhibits cardiomyocyte apoptosis which helps facilitate cardiac homeostasis, along with demonstrated ability to modulate the immune system. The herb benefits cardiovascular health by improving cardiac function, supporting energy metabolism, inhibiting free radicals and reducing insulin resistance. Studies show it promotes angiogenesis, protects against myocardial injury, and when combined with conventional therapeutics, improves outcomes in HFrEF (Heart Failure with reduced Ejection Fraction) patients without increased adverse reactions.[9]

*Ren Shen* (Ginseng) has been extensively studied for its cardioprotective properties, mainly due to its active triterpene saponins called ginsenosides.[9] These ginsenosides facilitate vasorelaxation (e.g. aortas, coronary arteries, cerebral arteries) by boosting the production of nitric oxide (NO) through increased endothelial NO synthase (eNOS) expression. Ginsenoside Rg3 especially triggers eNOS activation, resulting in NO-driven vasorelaxation that benefits vascular tone. Ginseng extract also inhibits ACE activity, supporting its antihypertensive effects. In addition to reducing blood pressure, ginseng provides powerful antioxidant, anti-inflammatory, and anti-hyperlipidemic effects, which all play crucial roles in slowing the progression of atherosclerosis and other cardiovascular diseases. Ginsenosides suppress inflammatory pathways like activator protein-1 (AP-1) and NF-κB, leading to lower levels of pro-inflammatory cytokines such as COX-2, IL-6, IL-1β, and TNF-α. Regular ginseng intake has been shown to decrease cholesterol and limit the development of atherosclerotic plaques. Moreover, ginseng offers strong antithrombotic properties by preventing platelet aggregation; primarily through changes in cellular signals (cAMP, ERK2), rather than through anticoagulation. Dihydro-ginsenoside Rg3 is especially effective in this regard, making ginseng a valuable option for people at heightened risk for thrombosis and cardiovascular issues. Overall, ginseng's ability to modulate key intracellular pathways underscores its benefits for individuals susceptible to blood clots and heart disease.[9]

*San Qi* (Notoginseng) has a long history of use in traditional Chinese medicine. Its attributes include: invigorate Blood, relieve Stagnation, stop pain, reduce swelling, and "stops bleeding while dispersing blood clot". It is used for chest pain due to Heart Blood Stagnation. Its primary active constituents, panax notoginseng saponins (PNS) have potent antioxidant benefits, effectively reducing ROS-mediated oxidative damage.[7] In aged rat models, PNS decreased cardiomyocyte apoptosis, greatly improved the morphological alterations in the myocardium, and alleviated mitochondrial dysfunction related to aging in a dose-dependent manner. Panax notoginseng polysaccharides (PNP) have demonstrated protective effects against ischemia/reperfusion injury in rats by boosting antioxidants and lowering inflammatory cytokines. Overall, *San Qi* contributes to cardiovascular health through its regulation of maintaining mitochondrial function and minimizing oxidative stress.[7]

*Dang Gui* (Angelica) has been used for millennia by Chinese medicine practitioners. In TCM it is used to nourish and replenish Blood, invigorate Blood and stop pain. The herb contains more than 70 diverse components (e.g. volatile oils, polysaccharides, flavonoids, alkaloids, organic acids).[10] Ischemic cardiovascular disease has been treated with angelica sinensis extract and its active ingredients since the 1980s. A major active component, ligustilide, plays a crucial role in mitochondrial health, reducing the severity of ischemic stroke.[7] Recent studies have shown *Dang Gui* can prevent doxorubicin-induced cardiac toxicity and reduce myocardial injury in animal models. In the rat aorta, it has been shown to increase NO formation and vascular relaxation.[10] In summary, it improves blood flow, reduces injury to the myocardium, supports energy metabolism and improves cardiac function in patients with heart failure.

Unlike the extensive research found in human medicine, veterinary medicine currently lacks randomized controlled clinical trials investigating the efficacy of TCVM treatment (either primary or integrated with conventional therapy) for heart disease in any species. Of note, last year Cheng and Shiau published a first-of-its-kind retrospective study evaluating the efficacy of TCVM in canine heart failure.[11] The authors assessed 36 dogs that either had failed to respond to conventional treatment (33/36), or whose owners preferentially selected TCVM treatment (3/36). Following treatment, the mean overall

clinical score significantly improved from 6.22 to 1.42 ($p$=2.9×10$^{-11}$) with all individual clinical signs (fatigue, cough, panting, sleep quality) showing statistically significant improvement ($p$<0.001). Ultrasound imaging revealed marked improvements: the LA:Ao ratio (left atrium-to-aorta ratio) decreased from 1.92 to 1.67 ($p$=9.3×10$^{-10}$), with 36.1% of dogs achieving normal LA:Ao values. Additionally, improvements in mitral valve regurgitation were statistically significant ($p$=3.0×10$^{-4}$).

In summary, the enduring wisdom of traditional Chinese medicine continues to illuminate new avenues for cardiovascular care, both through its rich philosophy and its evolving evidence-base medical research. As knowledge accumulates on the efficacy and mechanisms of Chinese herbal medicine and integrative therapies, the role of the Heart as the "Monarch" of the *Zang-fu* organs is reaffirmed. The emerging benefits of CHM, documented in human studies, underscore the need for veterinary clinical trials. By bridging ancient knowledge with contemporary science, integrative medicine approaches hold significant potential to enhance outcomes for both humans and animals with cardiovascular disease.

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