



Potential benefits of Chinese Herbal Medicine for elderly patients with cardiovascular diseases

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Abstract

Chinese Herbal Medicine (CHM), as the most common form of traditional Chinese medicine (TCM), has been playing an important role in the treatment of elderly cardiovascular diseases (CVDs) in China. In this paper, we briefly discuss on the potential benefits of CHM for elderly patients with CVDs. Initially, we summarize the characteristics of CVDs in the elderly, the present treatment of CVDs in the elderly, and the clinical applications of CHM for CVDs. Secondly, in addition to introducing the features of CHM, we discuss the differences between CHM and Western medicine. Lastly, the potential benefits of CHM are presented. We came to a conclusion that as mutual complementary, Western medicine and TCM together shall benefit the elderly patients with CVDs.

J Geriatr Cardiol 2013; 10: 305–309. doi: 10.3969/j.issn.1671-5411.2013.04.001

Keywords: Cardiovascular diseases; Elderly patients; Chinese medicine; Herb

1 Introduction

China and some other developing countries are experiencing an increasing prevalence of Cardiovascular diseases (CVDs) which is now the leading cause of death.^[1,2] Data from the Global Burden of Disease Study 2010 (GBD 2010) shows that one in four deaths were attributable to heart disease or stroke, and ischemic heart disease was the first cause of global Disability-Adjusted Life Years (DALYs) in 2010. Moreover, a greater proportion of these deaths are among elderly people (older than 70 years) in 2010, compared with 1990.^[3,4] With the aging of population, CVDs will have a higher prevalence and place a huge financial and social burden on human development. Despite improvements of clinical outcomes with percutaneous coronary intervention (PCI) and conventional Western medicine, elderly patients with CVDs remain at certain risk of recurrent acute cardiovascular events, complications as well as unfavorable quality of life.

Traditional Chinese Medicine (TCM), the amazing part of traditional Chinese culture, with a history of several

thousand years, has both unique theories and rich experience. Due to the lack of objective and quantitative evaluation criteria, TCM is currently considered as a Complementary, or Alternative, Medicine (CAM) in most Western countries. In China, however, it is reported that more than 71.2% of patients who had experienced Western medicine, TCM, and integrative medicine (IM), preferred the IM therapeutic method, and 18.7% chose TCM therapeutic methods as their favorite.^[5] Moreover, CAM, including TCM, is increasingly welcomed in many developed countries, such as Australia and the United States.^[6] Recently, as more clinicians successfully applied TCM in CVDs prevention and treatment based on conventional therapy, the effects of TCM for CVDs, especially in elderly patients with CVDs have drawn greater attention.^[7,8] In this paper, we briefly commented on the potential benefits of Chinese Herbal Medicine (CHM), the most common form of TCM, for CVDs in the elderly.

2 Characteristics of CVDs in the elderly

Most of the patients with CVDs are elderly. The characteristics of these patients have to be taken into account before treatment. For example: (1) their organs are in age-related declines, which may be a key factor of frailty. In this case, individuals may have the problem of impaired immunity.^[9] Furthermore, with hepatic and renal functions in declines, the application of many drugs will be affected,

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Received: December 2, 2013 **Revised:** December 11, 2013

Accepted: December 13, 2013 **Published online:** December 20, 2013

which will increase the risk of adverse effects.^[10,11] (2) Consideration of the usage of multiple drugs due to multiple diseases. Elderly patients with CVDs always have one or more co-morbidities, such as diabetes, hyperlipidemia, or hypertension. They often require the administration of several prescribed drugs daily which place them at a high risk for adverse effects, especially drug interactions.^[12] (3) Elderly patients with CVDs usually have hepatic and/or renal insufficiency. Thus, many drugs need a dose adjustment, and some drugs should be limited or avoided. For example, with hepatic dysfunction, statins should be limited or avoided. Similarly, with renal dysfunction, digoxin and most angiotensin converting enzyme inhibitor (ACEI), which are eliminated through kidney, should be started at lower doses. However, elderly patients receiving ‘target’ (high) dose ACEI therapy might have better cardiac outcomes with an insignificant increase in adverse effects.^[13,14] These usually put clinicians in a dilemma. (4) Particularly due to the pharmacokinetic and pharmacodynamic changes in older patients.^[15] Aging significantly affects drug distribution and elimination triggered by the age-related changes in hepatic and renal function, muscle mass, and plasma proteins. In addition, some co-morbidities, such as diabetes, can lead to renal dysfunction, which also result in pharmacokinetic and pharmacodynamic changes.

3 Present treatment of CVDs in the elderly

Western medicine, TCM, and IM are currently the three major models of health care in China, with Western medicine considered as the mainstream medicine. The evolution of Western medicine has substantially reduced mortality and morbidity associated with CVDs.^[16,17] At present, most patients with CVDs can receive more effective treatments, such as antithrombotic therapy combined with timely reperfusion therapy, PCI or coronary artery bypass grafting (CABG). However, particularly in elderly patients, potentially serious adverse effects associated with Western therapy, such as bleeding,^[18] orthostatic hypotension, bradycardia, or congestive heart failure, are still key challenges. In addition, an unfavorable quality of life resulting from drug-related gastrointestinal reactions, depression, dizziness, and cognitive impairment also bring clinicians into perplexity.

4 CHM for CVDs

Many experimental studies indicated that some Chinese herbs (e.g., “*Ren Shen*” (*Radix Ginseng*), “*Chuan Xiong*” (*Rhizoma Canxiong*) and “*Dan Shen*” (*Radix Salviae*

Miltiorrhizae)) have potential benefits for CVDs.^[19–22] Recent clinical trials and systematic reviews^[23–28] show that CHM (e.g., Xiongshao capsule, Tong Xin Luo capsule and Danshen dripping pill) can improve the health-related quality of life, lower the restenosis rate after PCI, reduce cardiovascular events, improve electrocardiogram (ECG) and serum myocardial injury biomarkers, decrease consumption of some chemicals, *etc.* Furthermore, only few mild side effects with spontaneous remission, such as abdominal distention from common CHM in elderly patients with CVDs can be found clinically. In fact, natural products with fewer side effects are what often come to mind when TCM is once mentioned. Nevertheless, it is too early to draw a conclusion of the safety of CHM for elderly patients with CVDs due to the insufficient evidence. Rigorously designed clinical trials with detailed description of adverse events are needed to further demonstrate the safety of CHM for CVDs.

It is worthy to mention that CHM will be a good choice for elderly patients with CVDs, especially those afflicted with other diseases, such as tumor, autoimmune disease, and metabolic disease. CHM can improve quality of life, reduce drug-resistance and toxic effects of chemicals, and assist in the decrease, or withdrawal, of glucocorticoids.^[29–31] Today, with an ever-growing number of people adopting CHM for clinical effectiveness and safety,^[5–8,32] CHM is playing an important role in the treatment of elderly patients with CVDs in China.

5 Features and advantages of CHM

5.1 Holistic regulation

TCM is characterized by “Holistic Regulation”. As a basic theory of TCM, holism is a concept of the organism as a whole, which refers to the integral unity of the human body and its close relationship with the outer world. In TCM theory, either excessiveness or insufficiency is illness, achieving equilibrium of the human being is considered as the therapeutic objective. Under these guidelines, practitioners of TCM pay more attention to the diseased patients rather than the suffered diseases in their clinical practice. They often treat patients by reinforcing the body’s immunity, eliminating pathogenic factors, and improving the ability of the self-healing capacity of the body.

5.2 Syndrome differentiation based treatment

As another feature of TCM, “Syndrome Differentiation Based Treatment (SDT)” refers to diagnosis and treatment based on an overall analysis of the illness and the unbalanced condition of the patient. What’s more, practitioners timely modify formulae in accordance with the varying

syndromes and clinical manifestations of the patient. As a basis of holistic regulation, a correct SDT always makes great contribution to the improvement of outcomes. On the other hand, SDT is an individualized treatment for different patients with same disease.

5.3 Complex interventions

The 2008 Medical Research Council Guide described complex interventions as interventions that contain several interacting components, which may have to do with the range of possible outcomes, or their variability in the target population, rather than with the number of elements in the intervention package itself.^[33] As a typical kind of complex interventions, the complexity of TCM is mainly reflected in SDT and the composition of a formula. A single herb contains interacting components, which play crucial roles in the comprehensive effects of CHM. Furthermore, TCM formulae exert comprehensive effects by containing several herbs served as “king-minister-assistant-envoy”. In fact, many researches on pharmacology and chemistry have indicated that both single herbs and formulae have features of multi-level regulation and multi-targets.^[34–37] These features may be the inherent foundation of complex interventions. In the theory of TCM, complex interventions are seen as a basis of holistic regulation. CHM handles the relationship between mind and body, disease and medicine in the view of holism, dynamic and dialectic. Finally, SDT, holistic regulation, and complex interventions, help the unbalanced body return to a harmony state.

5.4 Homology of medicine and food

As a distinguished feature of TCM, “Homology of Medicine and Food” means that CHM and foods originate from the same source. Traditionally, Chinese people prefer foods to drugs for health care, and certain kinds of herbs are regarded as both medicines and foods.^[38] For example, “*Shan Zha*” (hawthorn fruit) is also a medicine for its effects on dyspepsia and dyslipidemia. This, to some extent, reflects why CHM has few side effects.

6 Comparison between CHM and Western medicine

With the development of modern medical technology and biomedicine, Western medicine has made great contributions to the elderly patients with CVDs. However, there are still some challenges, as stated above, which are associated with both elderly patients themselves and Western medicine. Focusing on a specific physiological target, Western medicine often has a strong effect on a disease. For

example, statins can reduce the level of low-density lipoprotein cholesterol (LDL-C) dramatically. It is widely accepted that particular Western medicines usually work against a specific pathological process rather than a patient. Due to the strong pertinence, Western medicine will inevitably cause adverse effects. Compared with Western medicine, CHM mainly has the following advantages: complex interventions, holistic regulation, individualized treatment and fewer side effects.

In fact, both CHM and Western medicine have their own advantages and disadvantages. They can complement each other to give full play to their advantages in clinical practice^[8], e.g., by IM. Recently, a multicenter, randomized, double-blind, placebo-controlled trial indicated that administration of Xiongshao capsules in addition to standardized Western medication was effective and safe in reducing post-PCI restenosis and recurrent angina in elderly patients with coronary heart disease.^[25]

7 Potential benefits of CHM for elderly patients with CVDs

In recent decades, more and more clinicians have accepted and used CHM. CHM has made and continues to make great contributions to the health of CVDs patients. Due to the foregoing clinical aspects of frailty, polypharmacy, potential hepatic and renal insufficiency, and changes in drug distribution and elimination, elderly CVDs patients are often at an increased risk of adverse effects. To this special population, cardiovascular therapy requires more frequent monitoring, and individualized intervention with minimum adverse effects, CHM would be a good choice.

The various factors, including characteristics of elderly patients with CVDs, features of CHM, and relevant clinical evidences discussed previously, demonstrate the potential benefits of CHM for elderly patients with CVDs. The potential benefits may be embodied in individualized treatment, fewer side effects, improvement of health-related quality of life, lowering the restenosis rate after PCI, reducing cardiovascular events, *etc.*

In a word, although the efficacy of CHM is not as strong as chemicals on a pathological process of CVDs, CHM is indeed an alternative and complementary choice for elderly patients with CVDs due to its holistic regulation, individualized and complex intervention, as well as fewer side effects. As mutually complementary, Western medicine and TCM together shall benefit the elderly patients with CVDs. We expect more evidence from high quality trials to support the extensive clinical use of CHM for elderly patients with CVDs.

Acknowledgment

The current work was partially supported by the Twelve Five-year Plan of China (No. 2013BAI13B01 and No. 2013BAI02B01).

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