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Discussion on Controllable Risk Factors and Prevention Strategies of Cardiovascular and Cerebrovascular Diseases Based on the Concept of Preventing Diseases in Traditional Chinese Medicine

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Abstract:

With the continuous rise in the incidence of cardiovascular and cerebrovascular diseases, effectively preventing and controlling their controllable risk factors has become a pressing issue. The concept of "Preventive treatment of disease" in Traditional Chinese Medicine (TCM), originating from the "Huangdi Neijing," emphasizes the importance of disease prevention. This paper explores the major controllable risk factors for cardiovascular and cerebrovascular diseases, including hypertension, hyperlipidemia, diabetes, and unhealthy lifestyles, and analyzes the unique advantages of TCM in preventing and managing these risk factors. By integrating methods such as TCM syndrome differentiation and treatment, health preservation, and psychological adjustment, a series of comprehensive prevention and treatment strategies are proposed. These strategies aim to enhance public awareness of the prevention of cardiovascular and cerebrovascular diseases and reduce their incidence.

Keywords:

Traditional Chinese Medicine
Preventive treatment of disease
Cardiovascular and cerebrovascular diseases
Controllable risk factors
Prevention and treatment strategies

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1. Introduction

Cardiovascular and cerebrovascular diseases are among the leading causes of death and disability worldwide. Their increasing incidence and mortality rates have imposed a significant burden on society and families [1]. Western medical treatments often focus on disease management while neglecting the importance of prevention. In recent years, the concept of "preventive

treatment of disease" in traditional Chinese medicine (TCM) has gained increasing attention. This approach emphasizes prevention and intervention before the onset of disease, focusing on overall health and individual differences. TCM's "Preventive treatment of disease" philosophy stresses the prevention of disease occurrence through the regulation of the body's Yin-Yang balance, Qi and blood, and organ functions. This philosophy aligns with modern medicine's research on controllable risk factors for cardiovascular and cerebrovascular diseases. Factors such as hypertension, hyperlipidemia, diabetes, obesity, and smoking are widely recognized as significant risk factors for these diseases, and TCM has a unique theoretical and practical foundation for managing these factors. This paper aims to explore how to effectively identify and control the controllable risk factors for cardiovascular and cerebrovascular diseases based on the "Preventive treatment of disease" concept in TCM. By integrating TCM theory with modern medical research, the study hopes to provide new insights and methods for the prevention of these diseases, thereby reducing their incidence and improving people's quality of life.

2. The epidemiological trends and challenges of cardiovascular diseases

Cardiovascular diseases (CVD) refer to ischemic or hemorrhagic conditions affecting the heart, brain, and systemic tissues due to hypertension, hyperlipidemia, blood viscosity, and other factors [2]. Chronic CVD primarily includes coronary heart disease, stroke, and hypertension, predominantly affecting individuals over 50 years old with a high mortality rate [3]. The formation of CVD involves the combined effects of multiple risk factors such as blood pressure, blood glucose, and blood lipids. Wu *et al.* (1969) established the first hypertension prevention and control base in Beijing, China, creating the "Shougang Model" and ushering in a new era of CVD prevention and control in China [4]. Currently, preventive medicine proposes the concept of "three-tier prevention" [5]. Primary prevention, known as "etiological prevention," aims to eliminate or reduce the harm caused by pathogenic factors to the human body through effective measures, or to improve the body's resistance. Secondary prevention, or "pre-clinical prevention," emphasizes early detection, diagnosis, and treatment to control disease progression. Tertiary prevention, referred to as "clinical prevention," focuses on the treatment and management of those already affected to prevent further disease deterioration and the occurrence of complications.

3. The scientific connotation and application prospects of the "Preventive treatment of disease" concept in Chinese medicine

The concept of "Preventive treatment of disease" in Chinese medicine can be traced back to the ancient text "Shang Shu: Shuoming," which states, "Only by being prepared for everything, can one avoid troubles." Although this statement does not directly involve medical theory, its philosophical idea of "being prepared for everything" has inspired the concept of "preventive treatment of disease". The earliest embryonic form of this concept appears in the "Su Wen: Si Qi Diao Shen Da Lun," which says, "Therefore, the sage does not treat existing diseases but prevents them from occurring, does not deal with existing chaos but prevents it from arising. This is what it means." This passage explicitly introduces the concept of "Preventive treatment of disease" and emphasizes the importance of disease prevention. The "Su Wen: Si Qi Diao Shen Da Lun" divides the understanding of diseases into two stages: "preventive" and "existent." The core lies in the prevention and treatment of "preventive" diseases [6]. Sun Simiao further categorizes diseases into three stages: "preventive disease," "incipient disease," and "existent disease" in his "Bei Ji Qian Jin Yao Fang." "Preventive disease" refers to a state of yin-yang balance where "the vital Qi is stored internally, and evil cannot interfere." It represents the quantitative foundation for the development and transformation of diseases. "Incipient disease" is a sub-healthy state characterized by "gradual decline of vital Qi and weakened resistance to evil". "Existent disease" refers to a state of physiological dysfunction caused by "the decline of vital Qi and the internal invasion of evil." Zhang Zhongjing's "Treatise on Febrile and Miscellaneous Diseases" extends the ideological connotation of "preventive treatment of disease". Based on the principles of prevention before illness and prevention of deterioration after illness, it

expands the connotations to include “swift treatment upon the onset of illness, prevention of crisis during the peak of illness, and prevention of recurrence after recovery.” The theoretical connotation of this concept encompasses prevention before illness, prevention of deterioration after illness, and prevention of recurrence after recovery [7].

4. Major controllable risk factors for cardiovascular and cerebrovascular diseases

4.1. Unhealthy eating habits and related risk factors for metabolic abnormalities such as high blood lipids and high blood sugar

Unhealthy eating habits are significant controllable risk factors for cardiovascular and cerebrovascular diseases. A diet high in fat and cholesterol, coupled with inadequate intake of dietary fiber, increases the risk of these diseases. Studies have shown that a high-fat diet leads to elevated LDL-C levels, thereby increasing the risk of atherosclerosis and thrombosis [8]. Changes in diet and lifestyle and long-term weight gain in women and men [8]. Irregular eating patterns, such as having dinner too late or eating midnight snacks, can also negatively impact cardiovascular health [9]. Research indicates that excessive sodium intake can lead to increased blood pressure, subsequently elevating the risk of heart disease and stroke. Additionally, high-sugar and high-fat diets may trigger chronic inflammation, which is recognized as an important mechanism in the development of cardiovascular and cerebrovascular diseases [10]. Studies have found that the incidence of cardiovascular diseases is higher among diabetics than non-diabetics. The hyperglycemic state in diabetics can activate the polyol pathway to generate sorbitol, whose accumulation can induce cardiovascular and cerebrovascular diseases [11]. Hyperglycemia can promote the production of free radicals and increase the level of oxidative stress, which is considered an important mechanism underlying cardiovascular and cerebrovascular diseases as well as diabetic complications [12]. Simultaneously, insulin resistance and a hyperglycemic state can also cause changes in blood lipid levels, further increasing the incidence of cardiovascular and cerebrovascular diseases [13].

4.2. Lack of physical activity

The lack of physical activity is a significant controllable risk factor for cardiovascular and cerebrovascular diseases. Relevant literature indicates that insufficient exercise increases the risk of heart disease and stroke. Prolonged sedentary behavior can lead to the deterioration of cardiovascular health and increase the incidence of atherosclerosis [14]. Inadequate exercise often leads to weight gain and obesity, which are major risk factors for metabolic abnormalities such as hypertension, diabetes, and high cholesterol. These metabolic issues further elevate the risk of cardiovascular and cerebrovascular diseases [15]. Additionally, the lack of physical activity is associated with symptoms of depression and anxiety, and these mental health issues may indirectly increase the risk of cardiovascular and cerebrovascular diseases by affecting lifestyle and physiological mechanisms [16].

4.3. Smoking and drinking

Smoking is one of the major risk factors for cardiovascular diseases. Studies have found that smoking is closely related to the incidence and mortality of cardiovascular diseases, and smokers have a significantly higher risk of cardiovascular diseases compared to non-smokers [17]. The frequency of smoking is positively correlated with the risk of cardiovascular diseases, meaning the higher the frequency of smoking, the higher the incidence of cardiovascular diseases [18]. Passive smoking also increases the risk of cardiovascular diseases. Studies have shown that exposure to secondhand smoke significantly increases the incidence of cardiovascular diseases among nonsmokers [19]. Tobacco contains nicotine and harmful gases (such as carbon monoxide), which can cause chronic hypoxia and damage to vascular endothelial cells, accelerating the process of atherosclerosis [20].

4.4. Family genetic history

There is a clear familial genetic predisposition to cardiovascular and cerebrovascular diseases. Numerous studies have demonstrated that these diseases exhibit a certain genetic tendency [21]. Research has found that among patients with cardiovascular and cerebrovascular diseases, those with a family history have a significantly higher incidence rate compared to the control group without a family history [22]. For middle-aged and elderly

individuals living in the same environment, the incidence of cardiovascular and cerebrovascular diseases increases significantly if they have a family genetic history. Therefore, individuals with a family genetic history should pay special attention to preventing these diseases, including undergoing regular physical examinations, maintaining a healthy lifestyle, and actively managing other controllable risk factors.

5. Application of traditional Chinese medicine's "Preventive treatment of diseases" concept in the prevention of cardiovascular and cerebrovascular diseases

5.1. Preventive measures before disease occurrence: Adjustment of lifestyle

5.1.1. Dietary adjustments and nutritional supplementation

The "Huangdi Neijing" (Yellow Emperor's Inner Canon) emphasizes that "regular daily routines and avoidance of excessive labor" can lead to a long lifespan. Conversely, if one makes "recklessness their norm," they may experience a decline in health even before reaching fifty. Therefore, establishing a scientific and regular lifestyle is a basic requirement for preventive treatment of diseases. The "Su Wen: Si Qi Tiao Shen Da Lun" (Basic Questions of Yellow Emperor's Inner Canon: On the Regulation of the Spirit in Accordance with the Four Seasons) states, "Yin and Yang and the four seasons are the beginning and end of all things, the foundation of life and death. If one goes against them, disasters will arise; if one follows them, illnesses and suffering will not occur. This is what is meant by following the Tao (way)." Hence, people should adapt to the changes of the four seasons, maintain a healthy lifestyle, focus on health preservation and longevity enhancement, and improve their physical fitness to achieve the goal of staying healthy or minimizing illnesses.

In Traditional Chinese Medicine (TCM) theory, excessive consumption of rich, greasy, spicy foods, or overindulgence in smoking and alcohol can lead to dysfunction of the spleen, accumulation of dampness, production of phlegm, transformation into heat, extreme heat generating wind, invasion of the brain collaterals, and obstruction of the upper orifices, resulting in stroke. Additionally, excessive intake of rich and greasy foods can easily generate phlegm turbidity, block the meridians, obstruct the channels, disrupt the normal flow of Qi, and cause Qi stagnation and blood stasis, leading to chest Bi (obstruction). Research has shown that a simple dietary pattern can reduce the risk of stroke, while a Western-style dietary pattern may increase the risk of stroke [23]. Therefore, dietary adjustments and nutritional supplementation to reduce risk are among the preventive measures recommended by public health authorities.

First and foremost, it is crucial to reduce the intake of saturated fatty acids and trans fatty acids, as these fatty acids can elevate the oxidation rate of low-density lipoprotein (LDL), thus accelerating atherosclerosis [24]. It is advisable to opt for foods such as deep-sea fish, nuts, olive oil, and avocados. Additionally, the consumption of dietary fiber is paramount for cardiovascular health. Dietary fiber can hinder cholesterol absorption, facilitate its excretion, and aid in the reduction of blood pressure and body weight. Recommended food sources include whole grains, beans, vegetables, fruits, and nuts [25]. Maintaining an adequate intake of protein, particularly from plant-based sources, is also essential as it can contribute to lowering the risk of cardiovascular diseases. It is imperative to restrict the consumption of processed meat and red meat [26].

5.1.2. Exercise and physical fitness enhancement

The "Jin Kui Yao Lue" mentions, "If the meridians are moderately affected and the illness has not spread to the internal organs, immediate medical treatment should be sought. If one feels heaviness or sluggishness in the limbs, practices such as guiding exercises, breathing techniques, acupuncture, and massage with medicinal ointments should be employed. Care should be taken to prevent the nine orifices from being blocked." Traditional Chinese medicine exercise methods like guiding techniques, Tai Chi, and Ba Duan Jin, as non-pharmacological therapies, have certain potential in preventing and assisting the treatment of cardiovascular and cerebrovascular diseases. The Chinese Expert Consensus (2023) points out that traditional Chinese medicine fitness exercises have been incorporated into exercise prescriptions, indicating expert recognition of their positive impact

on cardiovascular health [27]. Practicing Ba Duan Jin and Tai Chi can effectively regulate spleen and stomach functions, promote Qi and blood circulation, protect nerve cells, and prevent and improve various neurological diseases [28], thereby indirectly promoting cardiovascular and cerebrovascular health. Research has shown that traditional Chinese medicine exercises, mainly Tai Chi, play an important role in cardiac rehabilitation. Such exercises can help improve heart function and facilitate the process of cardiac rehabilitation [29]. Modern research indicates that long-term adherence to moderate aerobic exercise, such as Tai Chi, yoga, and jogging, can enhance myocardial function, improve the heart's pumping efficiency, and reduce the risk of cardiovascular events [30]. Additionally, exercise helps improve blood lipid levels, increasing high-density lipoprotein (HDL) and reducing low-density lipoprotein (LDL) and triglycerides [31]. For obese individuals, reducing body fat accumulation is particularly important for lowering blood pressure [32]. However, it should be noted that patients with diagnosed cardiovascular diseases should follow medical advice and pay attention to exercise intensity when performing these exercises to ensure safety and effectiveness. It is recommended to choose an exercise mode suitable for personal health conditions and establish regular exercise habits, engaging in at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic exercise per week.

5.2. Prevention of disease progression, early intervention, and comprehensive treatment

5.2.1. Early screening and diagnosis

According to "Su Wen: Ci Re," an ancient Chinese medical text, "In the case of liver heat, the left cheek turns red first; for heart heat, the forehead reddens; with spleen heat, the nose becomes red; lung heat manifests as redness on the right cheek; and kidney heat is indicated by redness on the chin. Although the illness has not fully manifested, puncturing the areas where redness appears can be a form of preventive treatment." This passage underscores the importance of early intervention when the illness is just emerging, aiming to halt its progression before it becomes severe [33]. Therefore, traditional Chinese medicine (TCM) emphasizes syndrome differentiation and treatment, observing and recognizing subtle bodily changes to promptly identify underlying health issues. The core principle lies in preventing and intervening before the onset of illness, enabling comprehensive and lifecycle management of diseases. Through lifestyle modifications, integrated Chinese and Western medical interventions, health education and promotion, as well as the establishment of a robust prevention and treatment system, it can significantly enhance the prevention and treatment of cardiovascular and cerebrovascular diseases [34]. This approach provides theoretical guidance for disease prevention, treatment, and rehabilitation. The TCM theory of preventive treatment resonates with modern early screening and diagnosis practices. By comprehensively assessing risk factors for cardiovascular and cerebrovascular diseases, personalized screening programs can be designed. The integration of TCM's holistic diagnostic approach with modern early screening techniques, such as electrocardiograms, echocardiograms, CT scans, and MRIs, can effectively prevent disease progression.

5.2.2. Integrated treatment strategy of traditional Chinese medicine and Western medicine

The Chinese government has adopted the integration of traditional Chinese medicine (TCM) and Western medicine as a crucial strategy for the prevention and treatment of cardiovascular and cerebrovascular diseases. The "Healthy China Action - Implementation Plan for the Prevention and Treatment of Cardiovascular and Cerebrovascular Diseases (2023–2030)" clearly states the need to adhere to the integration of TCM and Western medicine, innovate institutional mechanisms and work models, and promote a shift from a "disease-centered" approach to a "people's health-centered" approach. The "three-tier prevention" concept in preventive medicine aligns with the TCM philosophy of preventive treatment. TCM believes that "when Yin and Yang are balanced and the spirit is harmonious, good health is achieved." This state of balance and harmony represents the optimal condition for life activities and is the health status pursued by "preventive treatment," emphasizing the balance of Yin and Yang and maintaining sufficient vital energy to resist pathogenic factors. The TCM idea of "preventive treatment" fully embodies a proactive and comprehensive prevention and treatment philosophy centered on health. Simultaneously, the treatment of cardiovascular and

cerebrovascular diseases has evolved from a sole focus on "treating the brain" or "treating the heart" to an integrated approach of "simultaneous treatment of the brain and heart" combining TCM and Western medicine. This holistic approach considers the health of both the heart and the brain. Zhang Boli, an academician of the Chinese Academy of Engineering, pointed out that the theory of "simultaneous treatment of the brain and heart" offers new perspectives and methodologies for the treatment of cardiovascular and cerebrovascular diseases with Chinese medicine [35]. Wu Yiling, another academician of the Chinese Academy of Engineering, and his team proposed "dredging therapy," which opens up a new avenue for the prevention and treatment of cardiovascular and cerebrovascular diseases. They suggest that "sun luo-microvessels" serve as the theoretical integration point and therapeutic breakthrough for studying microvascular lesions in Chinese and Western medicine. The integrated strategy of TCM and Western medicine encompasses a combination of drug therapy, lifestyle adjustments, rehabilitation training, and integrated prevention measures [36]. Studies have revealed that Qipo Shengmai Granules are highly effective in treating atrial fibrillation with Qi and Yin deficiency syndrome [37]. Based on Western medicine treatment, Chinese medicine can be reasonably applied to adjust the internal environment and enhance resistance. Patients are guided to make appropriate dietary adjustments, manage emotions, and engage in moderate exercise. The integrated treatment strategy of TCM and Western medicine is increasingly highlighting its significance in the prevention and control of cardiovascular and cerebrovascular diseases.

5.3. Prevention of recurrence after recovery: Rehabilitation and long-term management

5.3.1. Rehabilitation training and functional recovery

Rehabilitation training and functional recovery for cardio-cerebrovascular diseases are key to improving quality of life and reducing disability rates. Rehabilitation training, through professional guidance, aids in the restoration of motor, sensory, and cognitive functions. Functional recovery involves training to achieve independent completion of daily life and work activities. Rehabilitation training encompasses physical therapy, speech therapy, cognitive training, psychological counseling, and life skills training. Specific training plans should be tailored according to the patient's condition, stage of recovery, personal abilities, and needs, and should be conducted under professional guidance. During the process of functional recovery, the patient's self-management abilities are also crucial. They need to learn to apply the skills acquired during rehabilitation training, and the support and assistance of family members serve as an important safeguard.

5.3.2. Long-term management and improvement of quality of life

According to the "Su Wen: Si Qi Tiao Shen Da Lun," it is stated that "the Yin and Yang of the four seasons are the fundamental principles of all things. Therefore, the wise nourish Yang in spring and summer, and nourish Yin in autumn and winter, following their roots. Thus, they float and sink with all things in the gate of growth. If one goes against their roots, they will damage their essence and destroy their authenticity." Based on this, traditional Chinese medicine emphasizes preventing diseases by adapting to the changes of the four seasons, which can be applied to the long-term management of cerebrovascular diseases. Improving the quality of life is an important goal, encompassing various aspects such as physical health, mental health, social interaction, and economic burden, as mentioned in Wang *et al.*'s (2020) study on the comprehensive management of cardiovascular diseases [38]. Effective management strategies should include controlling related risk factors like hypertension, hyperlipidemia, and diabetes through medication and lifestyle adjustments to achieve stable indicators, and conducting regular medical check-ups to facilitate timely adjustments to treatment plans. Simultaneously, maintaining mental health is crucial, necessitating the provision of psychological counseling and support to assist patients in coping with issues such as anxiety and depression, as highlighted in Chen *et al.*'s (2022) systematic review on the economic burden of cardiovascular diseases in China [39]. Additionally, promoting social interaction and participation in social activities can help strengthen patients' social support networks. Reducing the economic burden can be achieved through medical insurance and assistance measures. By taking these factors into comprehensive consideration

and developing personalized intervention measures, effective disease control, reduction of recurrence risk, and significant improvement in patients' overall quality of life can be achieved.

6. Conclusion

Cardiovascular and cerebrovascular diseases are one of the leading causes of death globally, and thus their prevention and treatment are of utmost significance in the field of public health. In the development of modern medicine, the traditional Chinese medicine (TCM) concept of "preventive treatment of disease" offers a fresh perspective and approach to the prevention of cardiovascular and cerebrovascular diseases. As stated in the "Su Wen: Chapter on the Regulation of the Spirit According to the Four Seasons," "The sage does not treat diseases that have already occurred, but prevents their occurrence; he does not manage disorders that have already arisen but forestalls their arising. This is what is meant by saying that to treat diseases after they have formed is like digging a well when thirsty, or forging a weapon after the fight has begun—it is too late." This passage profoundly emphasizes the importance of intervening before the formation of diseases, preventing their occurrence by adjusting the overall state of the human body. The significance of this concept lies in its emphasis on early identification and intervention of risk factors for cardiovascular and cerebrovascular diseases, such as hypertension, dyslipidemia, diabetes, etc. By improving lifestyle measures such as moderate exercise, balanced diet, smoking cessation, and alcohol restriction, as well as implementing comprehensive health management including regular health screenings and personalized health education, the incidence and recurrence rates of cardiovascular and cerebrovascular diseases can be reduced.

The concept of "preventive treatment of disease" coincides with the three-tier prevention strategy of modern preventive medicine. By integrating the advantages of both Western and traditional Chinese medicine, a comprehensive prevention and control technology system can be established. From early monitoring to integrated management, this system can effectively reduce the incidence, recurrence, and mortality rates of cardiovascular and cerebrovascular diseases, thereby significantly improving the health status and quality of life of the population. Therefore, promoting and practicing the concept of "preventive treatment of disease" is one of the important strategies to enhance the prevention and control of cardiovascular and cerebrovascular diseases.

In ancient medicine, the "Synopsis of Golden Chamber" also mentioned, "When the meridians are moderately affected and the disease has not spread to the internal organs, prompt treatment should be administered. If the limbs begin to feel heavy and sluggish, methods such as guidance, exhalation and inhalation, acupuncture, and ointment massage should be employed to prevent the nine orifices from becoming blocked." This underscores the emphasis placed by ancient medicine on disease recovery, particularly the importance of physical exercise and bodily conditioning. Through appropriate exercises such as guidance, exhalation and inhalation, as well as acupuncture and ointment massage, the body's immune response can be significantly enhanced, preventing the further progression of the disease and alleviating symptoms, thereby promoting the early recovery of patients. This philosophy complements the prevention and recovery concepts of modern medicine, emphasizing the importance of holistic bodily conditioning and health management in the prevention and treatment of cardiovascular diseases. By comprehensively applying Western and traditional Chinese medicine methods, more comprehensive prevention and control of cardiovascular and cerebrovascular diseases can be achieved, providing patients with more comprehensive and effective health management solutions.

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