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Research Article

The Treatment of Hypertension with the Combination of Pinggan Qianyang Regimen in Combination with Amlodipine Tablets: A Systematic Review and Meta-Analysis

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Abstract

Objective: To compare the efficacy of traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets in treating hypertension through a meta-analysis of included studies, and ot provide evidence-based medical support for clinical practice. **Methods:** Comprehensive search was performed on major domestic and international databases, to collect the randomized controlled trials comparing the treatment of hypertension with traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets and amlodipine tablets alone. After extracting the relevant data, a meta-analysis was performed using the RevMan 5.2 software. **Results:** A total of 15 studies meeting the inclusion criteria were included, and a meta-analysis was conducted on 14 studies that reported the response rate, with a combined RR value of 1.17[1.12,1.23], Z=6.97, P<0.01. The funnel plot was essentially symmetrical. It suggests that the combination of traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets superior to control group in treating hypertension. A meta-analysis was conducted on 12 studies that reported systolic blood pressure, with a combined MD value of -7[-9.90, -5.29], Z=6.46, P < 0.01. The funnel plot was essentially symmetrical. It is known that the combination of traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets is superior to the control group in reducing systolic blood pressure. A meta-analysis was conducted on 12 studies that reported diastolic blood pressure, with a combined MD value of -7.33[-12.66, -2.00], Z=2.70, P<0.01. The funnel plot was essentially symmetrical. It is known that the combination of traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets is superior to the control group in reducing diastolic blood pressure. **Conclusion:** From the results of this study, the combination of traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets in the treatment of hypertension is effective.

Keywords: Hypertension; Pinggan Qianyang; Randomized Controlled Trials; Meta-analysis

Introduction

Hypertension is a clinical syndrome characterized mainly by increased systemic arterial blood pressure, which may be accompanied by multi-organ dysfunction or organic damage such as the heart, brain, and kidneys. According to reports [1], the number of hypertensive patients in our country has now exceeded 270 million. And the incidence of this disease has a clear trend of rising and becoming younger [2]. Hypertensive patients need to take antihypertensive drugs for a long time, which greatly increases the social and economic burden. Amlodipine is a third-generation calcium channel antagonist, a common Western medicine for treating hypertension, but long-term use has certain side effects and has no obvious effect on blood pressure variability [3-4]. traditional Chinese medicine Pinggan Qianyang Regimen is widely used in the treatment of hypertension, but there is still a lack of systematic reviews on the treatment of hypertension with the combination of traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets, and there is still controversy about whether traditional Chinese medicine has a blood pressure-lowering effect. For the controversial points of clinical treatment, meta-analysis can provide a good basis for evidence-based medicine. This study intends to search the literature related to hypertension according to the inclusion criteria, to conduct a systematic review of the treatment of hypertension with the combination of traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets, and to provide evidence-based medical basis for the clinical treatment of hypertension.

Subjects and Methods

Search Strategy

Comprehensive search of domestic and foreign medical literature was performed, with the scope of the search including: ① SinoMed Database; ② PubMed database; ③ Embase database; ④ Cochrane Library. The search time was from the establishment of the database to February 2024. Search terms: hypertension, hypertensive disease, high blood pressure, Traditional Chinese Medicine, TCM, Pinggan Qianyang, calming the liver and suppressing yang, Amlodipine, Luohuoxi, Anneizhen.

Inclusion criteria for literature: ① Confirmed diagnosis with hypertension; ② Randomized controlled studies of the treatment of hypertension with traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets; ③ Clearly defined expected outcome assessment indicators.

Exclusion criteria for literature: ①Secondary hypertension; ② Concurrence with other diseases or complications in organs such as heart, brain, kidney, etc.; ③ Intervention measures were not traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets; ④ Non-randomized controlled studies.

Literature screening

① Preliminary screening: Through computer and manual searches, the title and abstract were retrieved, unqualified literatures were eliminated obviously, and the original text of the remaining articles was retrieved.

② Secondary screening: Unqualified articles were further excluded by reading the full text.

Literature quality evaluation

The Jadad (1996) [5] 5-point scale was used to evaluate the quality of the literature.

Data extraction

Extract data from the study, including:(1) Basic information of patients; (2) Treatment measures; (4) Reports on loss to follow-up; (5) Outcome measures.

Statistical analysis

Meta-analysis was conducted using Review Manager 5.2 software. The results of the meta-analysis were represented by a forest plot, and the results of publication bias were represented by a funnel plot.

Results

Overview of included literature

A total of 205 articles on the treatment of hypertension with traditional Chinese medicine combined with amlodipine tablets were retrieved. According to the inclusion criteria, 34 articles were screened out through reading the title and abstract, and finally, 15 articles on the treatment of hypertension with traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets were included through reading the full text. The process of screening literature is shown in Figure 1.

Figure 1: Flowchart of literature screening.

The sample size of the included 15 studies ranged from 58 to 135 cases. Among them, 14 studies reported the response rate, and 12 studies reported changes in systolic and diastolic blood pressure after treatment. The basic characteristics of the included articles are shown in Table 1.

Included	Sample size (cases)		Gender (cases)		Age	Jadad	Intervention measures		Treatment duration (days)	Outcome measure
Study	Treatment group	Control group	Male	Female	(years)	Score	Treatment group	Control group		
Lin Liu [6] 2008	60	60	87	33	45-60	3	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	14	Efficacy, ystolic pressure, astolic pressure
Zhang Tai [7] 2012	50	40	59	31	42-69	3	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Efficacy, systolic pressure, diastolic pressure

Ning Cheng [8] 2014	40	38	39	39	48-70	2	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Efficacy, systolic pressure, diastolic pressure
Liu Wuding [9] 2017	29	29	33	25	38-81	2	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Efficacy
Wang Jian [10] 2017	68	67	94	41	31-63	2	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Efficacy, systolic pressure, diastolic pressure
Zhang Dajun [11] 2018	46	46	43	49	52-91	3	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Systolic pressure, diastolic pressure
Wei Jiaqi [12] 2019	31	31	29	33	47-72	3	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Efficacy, systolic pressure, diastolic pressure
Wang Jiaxin [13] 2019	45	45	40	50	45-60	3	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	15	Efficacy, systolic pressure, diastolic pressure
Yu Yan [14] 2019	47	47	50	44	26-68	3	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Efficacy
Zhang Zhijun [15] 2021	40	40	44	36	44-75	3	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Efficacy, systolic pressure, diastolic pressure
Xiong Ying [16] 2022	39	39	46	32	31-69	2	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Efficacy, systolic pressure, diastolic pressure
Cui Jia [17] 2023	40	40	45	35	61-77	3	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Efficacy, systolic pressure, diastolic pressure

Zhang Runlian [18] 2023	35	35	36	34	18-70	3	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Efficacy, systolic pressure, diastolic pressure
Xu Lu [19] 2023	50	50	54	46	46-53	2	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	84	Efficacy, systolic pressure, diastolic pressure
Zhou Guorui [20] 2023	40	40	48	32	60-74	3	Pinggan Qianyang Regimen combined with amlodipine tablets	Amlodipine tablets	28	Efficacy

Table 1: Basic characteristics of included articles.

Results of Jadad literature quality assessments

The literature quality assessment results showed that 10 articles scored 3 points, which were high-quality studies; 5 articles scored 2 points, which were low-quality studies.

Meta-analysis

Efficacy comparison

A meta-analysis was conducted on 14 studies that reported efficacy rates. Heterogeneity test P > 0. 05, I2<50%, a fixed effects model was used for analysis. See Figure 2. The diamond is on the right side of the vertical line, indicating that the combined traditional Chinese and Western medicine treatment group has a better therapeutic effect than the Western medicine control group, with a combined RR value of 1.17[1.12,1.23], Z=6.97, P<0.01.

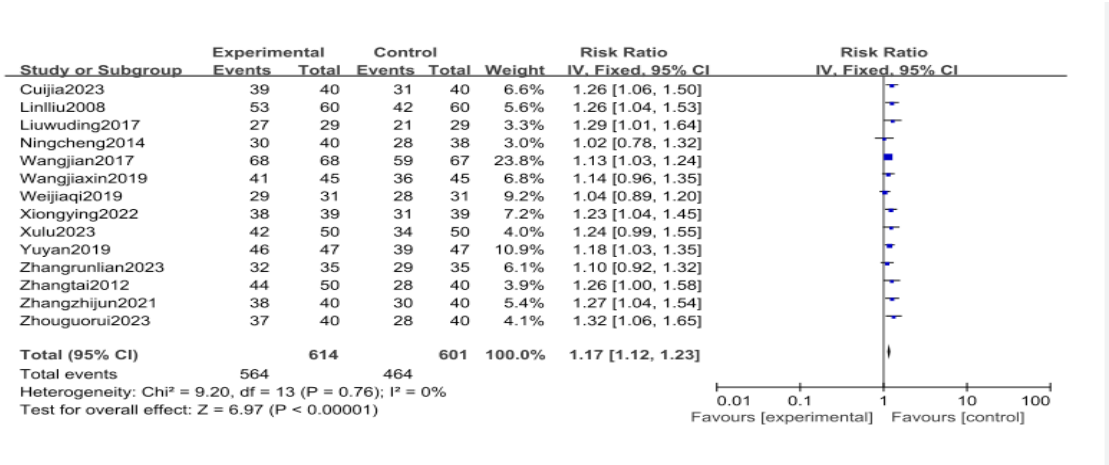

Figure 2: Efficacy analysis forest plot

The funnel plot for the comparison of efficacy shows a basic inverted funnel shape. See Figure 3. It can be considered that there is a smaller publication bias.

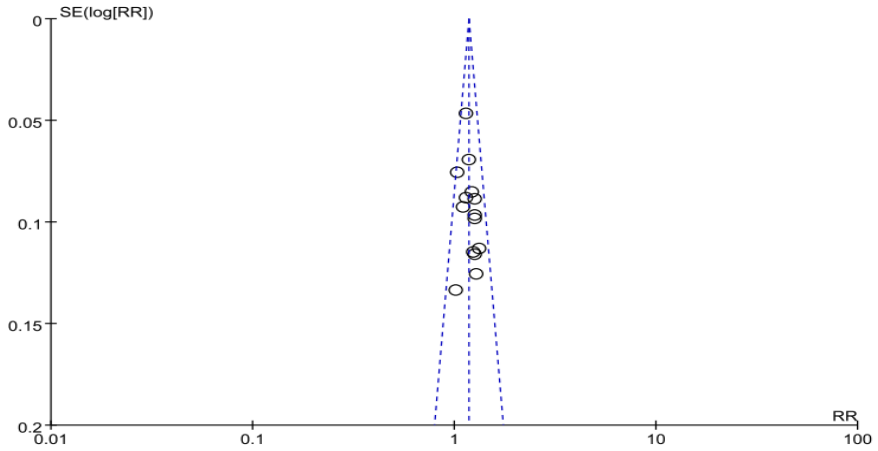

Figure 3: Efficacy analysis funnel plot.

Comparison of systolic pressure after treatment

A meta-analysis was conducted on 12 studies that reported changes in systolic pressure. Heterogeneity test P < 0. 05, I2>50%, a random effects model was used for analysis. See Figure 4. The diamond is on the left side of the vertical line, indicating that the combined traditional Chinese and Western medicine treatment group had a superior effect to the Western medicine control group in reducing systolic pressure, with a combined MD value of -7[-9.90, -5.29], Z=6.46, P<0.01.

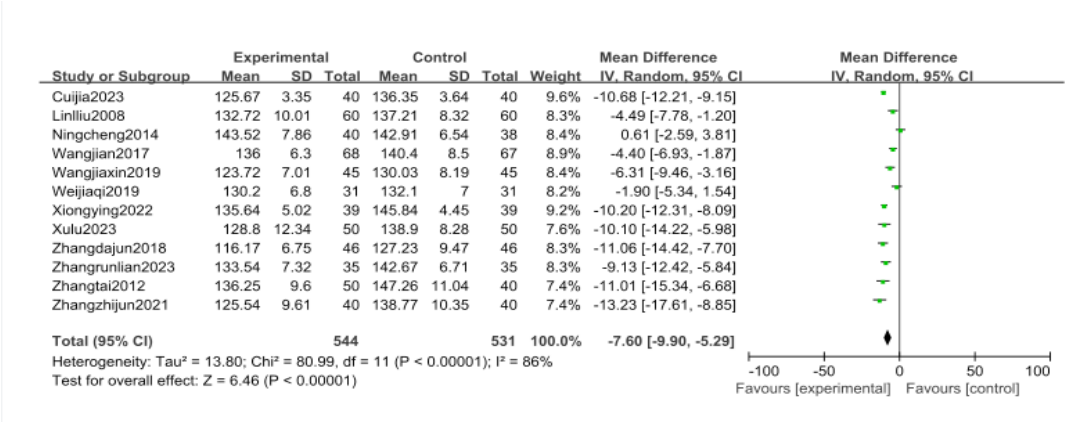

Figure 4: Systolic pressure forest plot after treatment.

The funnel plot for the comparison of systolic pressure after treatment shows a basic inverted funnel shape. See Figure 5. Centered on the mean difference MD, the included literatures are basically symmetrically distributed, indicating a smaller publication bias.

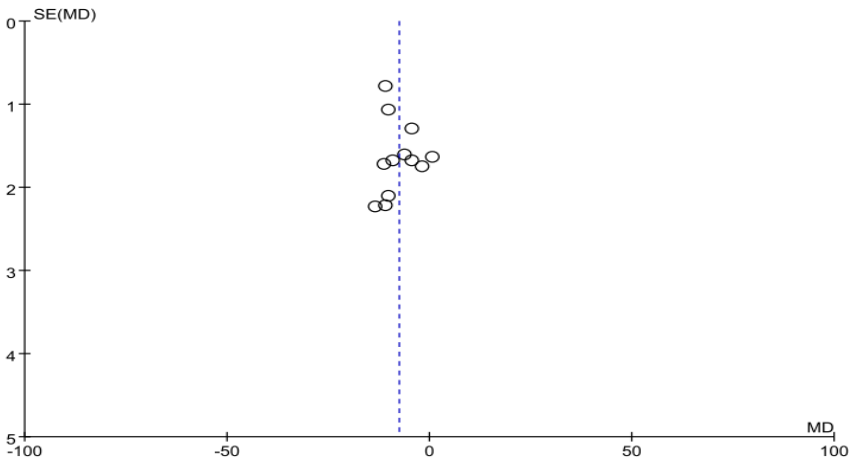

Figure 5: Systolic pressure analysis funnel plot after treatment.

Comparison of diastolic pressure after treatment

A meta-analysis was conducted on 12 studies that reported changes in diastolic pressure. Heterogeneity test P < 0. 05, I2>50%, a random effects model was used for analysis. See Figure 6. The diamond is on the left side of the vertical line, indicating that the combined traditional Chinese and Western medicine treatment group had a superior effect to the Western medicine control group in reducing diastolic pressure, with a combined MD value of -7.33[-12.66, -2.00], Z=2.70, P<0.01.

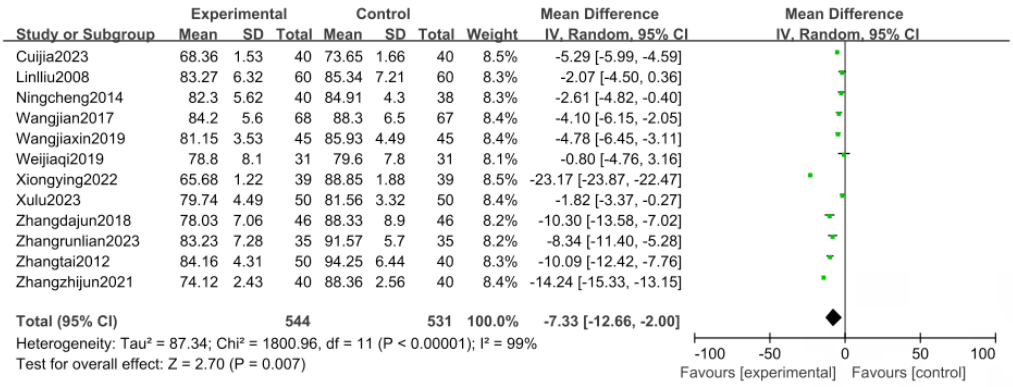

Figure 6: Diastolic pressure forest plot after treatment.

The funnel plot for the comparison of diastolic pressure after treatment shows a basic inverted funnel shape. See Figure 7. Centered on the mean difference MD, the included literatures are basically symmetrically distributed, indicating a smaller publication bias.

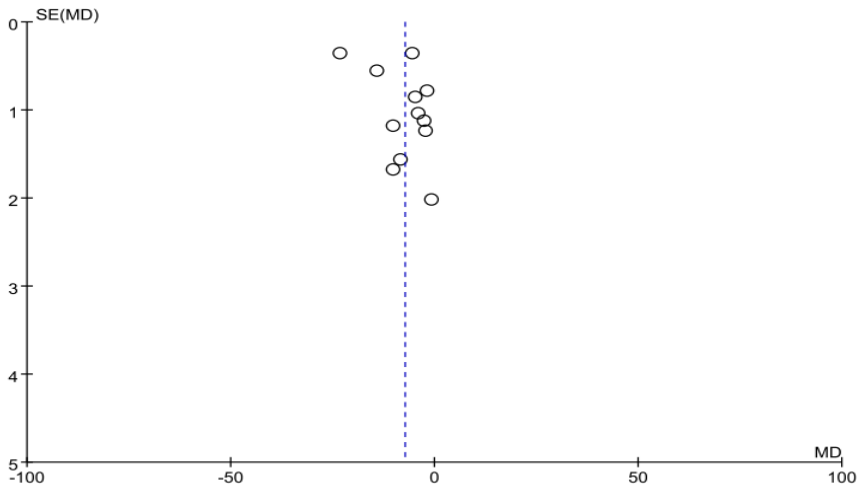

Figure 7: Diastolic pressure analysis funnel plot after treatment.

Discussion and Analysis

Traditional Chinese medicine, as an excellent part of Chinese traditional culture, has been used in China for thousands of years. However, clinical research in traditional Chinese medicine is mainly based on case reports and experience summaries, with less research in evidence-based medicine. How to screen reliable and objective scientific evidence from a large number of literatures has become an urgent issue that needs to be addressed in the development of traditional Chinese medicine.

Western medicine has a definite blood pressure-lowering effect in the treatment of hypertension, but there are side effects. Some patients clinically encountered are forced to stop and change drugs because they cannot tolerate the side effects of Western antihypertensive drugs. There are various methods of treating hypertension with traditional Chinese medicine, but both epidemiological surveys and literature studies show that: hypertension with liver yang hyperactivity is relatively common in clinical practice [21]. Statistical data show that the Liver Yang Hyperactivity type accounts for approximately 87.23% of hypertension cases [22]. Ancient Chinese medical texts such as "Huangdi's Canon of Internal Medicine (Huangdi Neijing)" and "Clinical Guideline to Medical Cases (Lin Zheng Zhi Nan Yi An)" all suggest that the pathophysiology of vertigo and headache is closely related to the liver. Since headache and vertigo are common symptoms of hypertension, many clinicians use the method of calming the liver and subduing yang to treat the syndrome of liver yang hyperactivity in hypertension.

Foreign studies have shown that there is endothelial dysfunction in hypertension [23], endothelial dysfunction plays an important role in the course of hypertension, and traditional Chinese medicine that calms the liver and subdues Yang has the effect of improving endothelial function. With the rapid development of immunology, more and more studies show a close relationship between the occurrence and development of hypertension and the abnormality of immune system function [24,25]. The treatment of hypertension with traditional Chinese medicine that calms the liver and subdues Yang is related to its ability to reduce the levels of inflammatory factors in the plasma and target organs, thereby inhibiting the occurrence and development of hypertension. However, some doctors argue that the treatment of hypertension with traditional Chinese medicine is mostly a summary of the personal treatment experience of traditional Chinese medicine practitioners, without quantified evaluation indicators, and the blood pressure-lowering effect is not certain. In response to the controversial points of traditional Chinese medicine clinical treatment, our research team conducted research in the field of evidence-based medicine.

Based the results of this study, in terms of efficacy, the combined treatment group of Pinggan Qianyang Regimen combined with amlodipine tablets had a combined RR value of 1.17[1.12,1.23], Z=6.97, P<0.01, indicating that the combined traditional Chinese and Western medicine treatment group was more effective. In terms of systolic pressure after treatment, when the treatment group was compared with the control group, the combined MD value is -7[-9.90, -5.29], Z=6.46, P<0.01. It indicates a significant difference, and the combined traditional Chinese and Western medicine treatment group is superior to the Western medicine control group in lowering systolic pressure. In terms of diastolic pressure after treatment, when the treatment group was compared with the control group, the combined MD value is -7.33[-12.66,

-2.00], Z=2.70, P<0.01. It indicates a significant difference, and the combined traditional Chinese and Western medicine treatment group is superior to the Western medicine control group in lowering diastolic pressure. The above funnel plots are basically symmetrical, showing an inverted funnel shape, and indicating a small publication bias.

From the articles included in this study, all were from Chinese authors, which has certain limitations. With more articles on the combined treatment of traditional Chinese and Western medicine for hypertension published in international journals in the future, it is hoped that more foreign research will be included in the future. In addition, in-depth research on the pharmacology of traditional Chinese medicine that calms the liver and subdues Yang can be carried out in the future to clarify the specific mechanism of action of traditional Chinese medicine, which will help traditional Chinese medicine to reach the world.

In summary, this study provided medical evidence for the treatment of hypertension with traditional Chinese medicine Pinggan Qianyang Regimen combined with amlodipine tablets, indicating that the efficacy is definite and worth promoting and applying clinically.

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Conflict of Interest: There is no conflict of interest in this paper.

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