

Hypertensive Nephropathy: Huangqi Injection Treatment

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Abstract

The extract of *Astragalus membranaceus* (Fisch.) Bunge is known as Huangqi injection (HQI), and it is frequently used in China to treat a wide range of illnesses. It is expected to have a significant role in hypertensive nephropathy adjuvant therapy.

HQI and antihypertensive medications should be evaluated for their effectiveness in treating hypertensive nephropathy. When combined with antihypertensive medications, HQI is more effective than antihypertensive medications alone at improving associated indexes in patients with hypertensive nephropathy, and a moderate dose of HQI may be more beneficial. The methodology's poor quality and the study's small sample size mean that further rigorous randomised controlled trials are required to corroborate the findings.

Introduction

One of the key risk factors for cardiovascular problems and kidney disease, which is regarded as a serious health issue and a potential cause of mortality throughout the world, is hypertension. It now has a tremendous load on the entire planet. A common side effect of hypertension is chronic kidney disease (CKD), which is a critical factor in the development of most types of CKD, including diabetic nephropathy. The advancement of kidney disease is sped up by hypertension, and the decline in renal function makes it harder to control blood pressure, creating a vicious cycle of progressive renal failure. The glomerular filtration rate (GFR) must remain above a certain level for chronic kidney disease (CKD) to progress to end-stage renal disease (ESRD). After diabetic nephropathy, hypertensive nephropathy is the primary cause of ESRD. The second most common cause of ESRD patients in the United States is hypertension. Every year, more than 30,000 people are given the diagnosis of ESRD caused by hypertension, and the number of people receiving the diagnosis of RSRD

keeps rising rapidly, creating a significant burden for the field of public health care.

Active intervention and blood pressure management should be used in patients with hypertension since lowering blood pressure can greatly lower the chance of developing chronic renal disease. Additionally, Renin-Angiotensin-Aldosterone System (RAAS) activation, arteriosclerosis, water and sodium retention, and genetic vulnerability are all associated with the development of hypertensive nephropathy. An important marker of cardiovascular events and renal function is microalbumin (mALB), which was defined as the excretion rate of urine albumin between 20 and 200 mg/min or 30 and 299 mg/d. The advancement of ESRD is highly correlated with the degree of mALB. The progression of renal disease can be slowed down when albuminuria and blood pressure are both reduced. Traditional Chinese Medicine is frequently utilised in the treatment of hypertension and chronic renal disease as an adjunctive alternative medical therapy.

Chinese herbal medicine known as Huangqi Injection (HQI) is made from the dried roots of *Astragalus membranaceus* (Fisch.) Bunge that have been sterilised and extracted with water. The pharmacological effects of HQI are extremely diverse. With the use of ultra-high performance liquid phase tandem quadrupole time-of-flight mass spectrometry, 46 active HQI components, including saponins, flavonoids, and amino acids, have been discovered. According to studies, HQI can widen blood vessels, improve renal microcirculation, reduce myocardial oxygen use, raise coronary and renal blood perfusion, remove lipid peroxides, and scavenge ROS. HQI can increase extracellular calcium (CA²⁺) input and sarcoplasmic reticulum calcium (CA²⁺) outflow, limit phosphodiesterase activity, decrease cAMP breakdown, increase cardiomyocyte excitability, and so improve cardiac contractility. By enhancing the Arginine Vasopressin (AVP) system and levels of aquaporin2, which are dependent on the AVP, HQI can block the formation of thromboxane, decrease blood viscosity, relieve water retention, and raise eGFR.

The results of numerous clinical studies conducted in recent years comparing the efficacy of HQI combined with antihypertensive drugs with that of antihypertensive drugs alone in the treatment of hypertensive nephropathy show that the combination of HQI and antihypertensive drugs benefits patients, but the efficacy of HQI in the treatment of hypertensive nephropathy has not been extensively studied. Therefore, to ascertain the effectiveness of HQI in adjuvant treatment of hypertensive nephropathy, we carried out a systematic review and meta-analysis.

Conclusion

In patients with hypertensive nephropathy, the combination of HQI and antihypertensive medications is more important in improving the associated indexes than taking antihypertensive medications alone, and an evidence dose of HQI may be more beneficial. In individuals with hypertensive nephropathy, HQI in combination with antihypertensive medications significantly improves renal function and blood pressure control. The methodology's poor quality and the study's small sample size mean that further rigorous randomised controlled trials are required to corroborate the findings.