JOURNAL OF CRITICAL REVIEWS
ISSN- 2394-5125 VOL 07, ISSUE 01, 2020

ROLE OF GARLIC, ONION AND GINGER IN CONTROLLING HYPERTENSION

Loveneet Kaur

Department of Botany & Environment Science, Mata Gujri College, Fatehgarh Sahib, Punjab (India)

ABSTRACT

A worldwide epidemic, hypertension (also known as high blood pressure, or BP) is a chronic medical condition. Because of their low cost, higher acceptability, and fewer side effects, herbal medicines are used by a large portion of the world's hypertensive population for primary healthcare. Numerous ethnobotanical investigations conducted in various parts of the world revealed that hundreds of plants are used worldwide for empirical treatment of hypertension. These plants are naturally occurring medicinal plants and herbs with antihypertensive potential. In order to promote future pharmacological and phytochemical research, this paper gives fundamental understanding about garlic, onion and ginger used to treat high blood pressure.

Key Words: Herbs; medicinal plants; benefits; hypertension

INTRODUCTION

At the health screening camp, hypertension was defined as having a history of the condition, being treated medically for it, or having a systolic or diastolic blood pressure that was greater than 140 mmHg or 90 mmHg [1]. Patients were considered to have hypertension if they disclosed it together with a previous medical diagnosis of the condition from a healthcare professional. With a global prevalence of 40.8 percent and a 32.3 percent control rate, hypertension is a serious public health issue [2]. According to Wilson PW et al. [3], hypertension increases the chance of developing chronic renal disease and cardiovascular disease [4]. 9.4 million fatalities worldwide are ascribed to hypertension-related consequences, including 45% of all deaths from coronary artery disease and 51% of all deaths from stroke [5]. Nearly 80% of deaths from cardiovascular disease occur in low-income nations, where hypertension is more prevalent [6].

According to a World Health Organization report, in 2008, nearly 40% of persons over the age of 25 had hypertension [7]. Global age-adjusted mean systolic blood pressure (SBP) trends were examined by Danaei et al. According to his data, between 1980 and 2008, the mean age-adjusted SBP dropped by about 2mmHg. The greatest age-adjusted SBP was seen in low- and middle-income nations. Mean age-adjusted SBP increased in economically emerging regions like Oceania, East Africa, South and South-east Asia during the same time period as it decreased in economically developed regions like Australia, North America, and Western Europe. Additionally, between 1980 and 2008, it was estimated that the number of people with uncontrolled hypertension rose due to the rise and ageing of the global population [8].

A dire scenario for the Indian population is painted by an alarming rise in HTN predicted by the Global Burden of Hypertension 2005 study and the GBD 2010 report [9,10].

Beyond initiatives focused at preventing hypertension, treating it is still difficult in many parts of the world [11].

Three plants i.e. garlic, onion and ginger are studied in this paper for their anti-hypertensive properties.

Allium sativum

Kingdom: Plantae

Family- Amaryllidaceae

Subfamily- Allioideae

Genus- *Allium*

Species- *A. sativum*

IMPACT OF GARLIC ON HYPERTENSION PREVENTION:

Garlic supplements have demonstrated their efficacy in the management of hypertension, lowering blood pressure by approximately 10 mm Hg systolic and 8 mm Hg diastolic, similar to that of conventional BP medicine. The antibacterial, antioxidant, anti-inflammatory, anti-cancer, and hypocholesterolemic properties of this herb are well known [12]. One study showed that the efficiency of garlic in the treatment of HTN was around 80%. Compared to other forms of garlic, aged garlic extract (AGE) causes a consistent reduction in blood pressure. Additionally, taking garlic supplements significantly lowers SBP and DBP by 3.75 and 3.39 mm Hg, respectively [13]. In a different trial, HTN patients who took garlic tablets (300–1500 mg/day) for 24 weeks reported significant drops in SBP of 9.2 mm Hg and DBP of 6.27 mm Hg [14]. A daily dose of 150 or 400 mg/kg of aged garlic extract (AGD) caused an increase in eNOS activity and a decrease in nicotinamide adenine dinucleotide phosphate (NADPH)-oxidase in the aortas of fructose-fed rats. Furthermore, aged garlic extract (AGD) has superoxide scavenging abilities in human neutrophils [15]. Garlic's constituents block ACE activity, reduce II-induced vasoconstrictor responses, stop VSMC proliferation in smooth muscles, counteract endothelin-1-induced vasoconstriction, and limit NF-KB stimulation [16].

GARLIC'S CHEMICAL COMPOSITION

There are several varieties of garlic available, however, raw garlic and aqueous extract preparation are more commonly utilised. The principal bioactive molecule in garlic, allicin, has sulphur as its main component, which when broken down provides garlic with its distinctive smell. Other significant sulfur-containing chemicals in garlic, besides alliin, include methyl thisulfonate and 1-propenyl allyl thisulfonate [17].

Allium cepa

Plantae: Kingdom

Order- Asparagales

Family- Alliaceae

Genus - *Allium*

Species : *A. cepa*

Onions, or Allium cepa, are members of the Liliaceae family. It is a plant that is primarily found in the temperate zone. George and Pamplona claimed that onions have antihypertensive properties [18]. The majority of onions have trace levels of folic acid, vitamin B6, and vitamin C. With an energy value of 166 Kj per 100 g serving and minimal fat and sodium content, they can add flavour to savoury recipes without significantly increasing caloric content [19].

Allium cepa

Molecular elements found in onions, such as phenolics and flavonoids, have been shown in preliminary studies to have potential anti-inflammatory and antioxidant capabilities [20]. In normotensive rats given fructose and under anaesthesia, onion was found to lower blood pressure [21]. Organo-sulfur compounds have been linked to lowering blood pressure by preserving the major arteries' flexibility and lowering blood viscosity, which prevents blood clotting [22]. By reducing oxidative stress through its interaction with free radicals and advancing vascular function, onions can lower BP on average by 5 mm Hg [22].

Zingiber officinale

Plantae: Kingdom

Order- Zingiberales

Family- Zingiberaceae

Genus - *Zingiber Mill*

Species - *Zingiber officinale*

The Zingiberaceae family includes the species of ginger. There are up to 24 genera and about 300 species covered by this family. Perennial tuberous or rhizomatous roots are found in ginger plants. The flowers are small and have a soft yellow colour. The plant is grown in Punjab, India, Bangladesh, and Taiwan. In warm climates, this perennial flourishes [23].

It is believed that the volatile oils in ginger contain active components. The sesquiterpenes bisabisabolenezingiberene and zingiberol are the main active components of ginger oil [24, 25]. Depending on the growing environment, different active component concentrations exist. Different physiologic effects are produced by ginger's active components [26, 27].

Zingiber officinale

Zingiber officinale, more often known as ginger, has long been utilised in traditional medicine and as part of regular diets. Potassium, which is abundant in ginger and helps control blood pressure, plays a key part in this process [28]. Rats under anaesthesia had their arterial blood pressure decline as a result of the ginger extract's crude effects [29].

Conclusion

Although it may be controlled and even outright banned, hypertension (HTN) is one of the most common disorders in the world and poses numerous challenges for those who suffer from it. High blood pressure is a common disorder where the blood's long-term strain against the walls of your arteries is so great that it may eventually result in health issues like heart illnesses. Changing one's lifestyle is one of several straightforward methods that can be used to control high blood pressure. The plants such as garlic, onion and ginger that lower blood pressure are covered above in this project. These plants are discussed in detail in this paper. Still more research is required in this field.

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