



A SYSTEMATIC REVIEW ON ESSENTIAL HYPERTENSION~ VYANABALA VAISHAMYAM AND ITS AYURVEDIC MANAGEMENT

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ABSTRACT

In the present competitive era, health is the least concern of the people. Since the work environment demands the ultimate input, there is a lot of stress on each individual. Stress along with a sedentary lifestyle and improper food habits leads to many life-style disorders. The major lifestyle disorders affecting the global population are Diabetes mellitus, Hypertension, and obesity which are the risk factors for serious other illnesses. Hypertension is one of the major health issues affecting the global population in recent days. It also plays an important risk factor for many serious medical conditions like Stroke, Myocardial infarction, retinal damage, kidney damage, aneurysms, and many more. The commonly used medications are diuretics, beta-blockers, calcium channel blockers, ACE Inhibitors, ARBs, and alpha-blockers. Since contemporary medicine leads to life-term medication dependency, also comes with a list of contraindications and has some major side effects such as functional renal insufficiency, hyperkalemia, oedema, etc. Few patients don't respond to any anti-hypertensive medications irrespective of the absence of any secondary causes. *Ayurveda*, an upcoming alternative system of medicine, is expected to provide some alternative and supportive management. In *Ayurveda*, it can be correlated to *Vyana bala vaishamyam*. Single herbs like *Sarpagandha*, *Arjuna*, *Brahmi*, *Shankhapushpi*, and *Punarnava* are commonly used. Compound medications like *Sarpagandha Ghana Vati*, *Arjuna Ksheerapaka*, *Shankhapushpi Ghana Vati*, and *Brahmi Vati* are commonly

used. *Shirodhara* is one of the effective treatments for stress-induced hypertension. *Shodana Chikitsa* like *Virechana* and *Vasti* can also be done.

Keywords: Hypertension, *Vyana bala vaishamyam*, *Vyana Vayu*, *Sarpagandha*, *Shankapushpi*, *Arjuna*, *Brahmi*

INTRODUCTION

Hypertension (HTN) is defined as elevated blood pressure. Blood pressure is defined as the pressure exerted on the column of blood on the wall of arteries laterally (1). The normal blood pressure is <120 mm hg systolic and <80 mm hg diastolic blood pressure, Prehypertension is 120-139 mm hg and 80-89 mm hg of systolic and diastolic blood pressure respectively, Stage 1 HTN is 140-159 mm hg and 90-99 mm hg and stage 2 HTN is more than or equal to 160 mm hg and more than or equal to 100 mm hg respectively (2). Hypertension is mainly of two types- primary and secondary. Primary or essential hypertension accounts for about 90-95 % of cases and is without any particular causes. The main risk factors of essential hypertension are old age, obesity, increased salt intake, alcohol intake, sedentary lifestyle, and smoking (3). And essential hypertension has a role in genetics since it is estimated that 20- 60 % of cases are inherited genetically. The mechanisms behind hypertension are increased cardiac output, increased peripheral resistance, stimulation of the sympathetic nervous system, increased sodium retention in the body, increased renin secretion, and increased aldosterone secretion. The main treatment includes the necessary lifestyle modification including physical activity, dietary salt reduction, and cessation of smoking and alcohol. The pharmacological intervention includes Diuretics, Beta blockers, Alpha antagonists, ACE inhibitors, Angiotensin II antagonists, Renin inhibitors, Calcium antagonists, and Direct vasodilators (4). In *Ayurveda*, it can be correlated clinically as *Vyana Bala Vaishamyam*. *Vyana Vayu* is a division of *Vayu* situated in *Hrdaya* (heart) and is responsible for all the activities of the body, *Rasa Samvahana* (movement of *Rasa Dhatu*), *Sweda*, and *Asruk Sravana* (circulation of sweat and blood) (5). An increase in *Vyana Vayu* may cause the increased or forceful movement of *Rasa* and *Rakta Samvahana* which can be correlated to Hypertension. Thus, it is correlated with the term

Vyana Bala Vaishamyam. It also mentioned that the vitiated *Vyana Vayu* may cause *Sarva Deha Roga* (diseases affecting the whole body) (6) which can be correlated with Stroke (a main complication of hypertension) or the diseases occurring in the whole body (various organ damages due to hypertension). The treatment includes *Shodana* (purificatory treatments) and *Shamana*. In *Shodana* therapy, *Virechana* (purgative therapy) can be done and the *Shamana Chikitsa* includes *Bahya Chikitsa* (external treatment) and *Abhyantara Chikitsa* (internal treatment). In *Bahya Chikitsa*, *Shiro Dhara* is one of the proven treatments for essential hypertension especially stress-induced. In *Abhyantara Chikitsa*, the formulation like *Sarpagandha Ghana Vati* (7), *Arjuna Ksheerapaka* (8), *Shankapushpyadi Ghana Vati* (9), *Brahmi Vati* (10), *Chandraprabha Vati* (11), *Gokshuradi Guggulu* (12).

AIM AND OBJECTIVE:

1. To review essential hypertension from an *Ayurvedic* perspective and its possible correlation.
2. To review the available literature on essential hypertension in modern literature and its management
3. To review the available and proven treatment options in the *Ayurveda* system of medicine.

MATERIAL AND METHODS:

Essential hypertension has been studied extensively in Classical textbooks of medicine by Harrison's principle of internal medicine, and Davidson's book of internal medicine. *Vyana Vayu*'s location, function, and *Vikrutha Karma Lakshana* have been extensively studied in *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hrdaya*. The information from the clinical trials on the effect of *Ayurvedic* medicine on essential hypertension has been studied vastly.

PATHOPHYSIOLOGY OF HYPERTENSION:

There are so many mechanisms involved in the regulation of arterial blood pressure. Any derangement in these mechanisms results in Hypertension. One of the

main mechanisms involved in the increase of arterial blood pressure is increased sympathetic outflow of catecholamines such as epinephrine and norepinephrine. Mainly adrenergic receptors are divided into two types α and β and further divided into α_1 , α_2 , and β_1 and β_2 . α receptors have an affinity toward norepinephrine and β receptors to epinephrine. α_1 receptors are responsible for vasoconstriction and are located in postsynaptic cells in smooth muscle and α_2 receptors are located on presynaptic membranes of postganglionic nerve terminals that synthesize norepinephrine and mostly act as a negative feedback controller by inhibiting the release of norepinephrine. Activation of α_1 receptors increases sodium reabsorption in the kidney. β_1 receptors in the heart increase cardiac contractility and increase cardiac output and also stimulates renin production in the kidney. Activation of β_2 receptors by epinephrine cause vasodilation. The immediate regulation of arterial blood pressure occurs with baroreceptors. Baroreceptors are situated in the carotid sinus and the increased arterial pressure stretches the baroreceptors and causes a decrease in sympathetic outflow thus arterial blood pressure is reduced. The baroreceptors gradually get accustomed to sustained high blood pressure. Another important mechanism involved in the regulation of blood pressure is renin-angiotensin-aldosterone mechanisms. Renin is mostly synthesized in inactive form prorenin by the renal afferent arteriole and also directly into the circulation. The secretion of renin depends upon three primary stimuli. They have decreased sodium transportation in the ascending Henle's loop, decreased pressure or blood perfusion in renal afferent arteriole, and the neural sympathetic stimulation to renin secreting cells. Renin converts the angiotensinogen into angiotensin I and a converting enzyme which is located primarily in pulmonary circulation convert the angiotensin I to Angiotensin II and the same enzyme is responsible for the inactivation of vasodilator Bradykinins. Angiotensin II is responsible for vasoconstriction and aldosterone secretion. Aldosterone increases sodium reabsorption; flushes potassium and increased aldosterone secretion may result in alkalosis and hypokalemia. Excess sodium increases the intravascular volume and increases

blood pressure. Thus, aldosterone and increased sodium intake increase blood pressure. Increasing age may reduce the elasticity of blood vessels which also plays a role in the manifestation of hypertension (13).

COMPLICATIONS OF HYPERTENSION:

The sustained rise in hypertension may cause damage mainly in the heart, brain, kidney, and peripheral arteries. In the heart, it may lead to cardiac arrhythmias, coronary artery disease, and left ventricular hypertrophy which increases the risk of myocardial infarction and congestive heart failure. Angiotensin II is also related to apoptosis, vascular remodeling, and repair. Excess tissue angiotensin II is related to Left ventricular hypertrophy and atherosclerosis. In the brain, it may lead to stroke due to multiple small lacunar infarcts or large single infarcts due to occlusion as a part of atherosclerosis, or due to rupture of small vessels. It also leads to dementia due to the deposition of beta-amyloid. It may also lead to hypertensive encephalopathy, which is characterized by severe headache, nausea, and projectile vomiting if left untreated may lead to stupor, coma, seizures and death. In the kidney, it may lead to glomerular injury and reduces the glomerular filtration rate. It may also lead to renal artery stenosis due to sustained blood pressure which may lead to reduced blood perfusion to the kidney and thus increased secretion of renin and thus the vicious cycle is formed (14).

TREATMENT IN CONTEMPORARY MEDICINE:

When the systolic blood pressure is reduced by 10-12mm hg and the diastolic to 5-6 mm hg, the complications of hypertension such as stroke, heart failure, and coronary heart diseases get reduced. The diagnosis should be based on the average of two values taken in two separate visits or more. The available treatment options are diuretics, blockers of the renin-angiotensin system, aldosterone antagonists, beta-blockers, α adrenergic blockers, calcium channel blockers, direct vasodilators, and sympatholytic agents. The response of the hypertensive patients to each of the medication vary mostly depending upon the mechanism involved in the raise of blood pressure.

Diuretics:

Diuretics are the initial, safe, efficacious treatment available for hypertension and are most commonly used in systolic hypertension, especially in elderly patients. It acts on the Henle's loop and inhibits sodium absorption and promotes excretion and it also has a vasodilation effect. They are usually combined with beta-blockers, ARB, or ACE inhibitors. They might produce hypokalemia, insulin resistance, or metabolic syndrome. It is usually given in hypertensive patients with a reduced glomerular filtration rate. The commonly used diuretics are hydrochlorothiazide, amiloride and triamterene. Hydrochlorothiazide possesses side effects like insulin resistance, hypokalaemia, and increased cholesterol level. Even though amiloride and triamterene don't cause hypokalaemia, they are weak diuretics. Angiotensin receptor blockers: Angiotensin receptor blockers provide blockade to the Angiotensin receptor type I and thus allow the angiotensin Receptor type II to show the vasodilator effects. It can opt for hypertensive patients with coronary syndromes and congestive heart failure. The contraindications of ARBs are bilateral renal artery stenosis, renal failure, hyperkalaemia, and pregnancy.

Beta-blockers:

Beta-adrenergic blockers decrease heart contractility, and cardiac output and reduce blood pressure. They are contra indicated in COPD, asthma, 2nd and 3rd-degree heart block, and sick sinus syndrome.

Calcium channel blockers:

Calcium channel blockers reduce intracellular calcium levels and reduce vasoconstriction and reduce blood pressure. They are contraindicated in 2nd and 3rd-degree heart blocks. These are the most commonly used anti-hypertensives in contemporary medicine (15).

VYANABALA VAISHAMYAM:

In *Ayurveda*, it can be correlated to *Vyanabala Vaishyam*. *Vyana Vaayu* is a division of *Vaayu* situated in *Hridaya* and is responsible for all the movements in the body. It plays an important role in circulation of *Rasa* and *Rakta Dhatu* and especially *Rakta Spandana Guna* (pulsatile property) is due to *Vayu*. If there is *Vata Prakopa*, there will be increase in the *Spandana* of *Rakta Dhatu*. This phenomenon can be correlated to increased blood pressure which is nothing but the

lateral pressure on the arterial wall is increased. *Rakta* is also affected in this process which in turn vitiates the *pitta dosha* also. One of the main causes of hypertension is increased intake of salt. *Lavana* (salt) has *Sukshma*(penetrating property), *Usna* (hot), *Abhishyandi* (sticky), *Vyavayi* (spreads the whole body before proper *Jataragni Paaka*) *Guna* (16), and vitiates *Kaphapitta* and causes *Rakta Dushti* (15). Due to the *Pitta* and *Rakta Dushti*, *Vata* gets *Prakupita* (vitiated) by *Avarana*. Also, Stress plays an important role in Essential hypertension which can be correlated to *Krodha*, *Soka*, and *Vishada Manasika Bhavas*. These *Manasika Bhavas* are known to aggravate the *Vata* and *Pitta Doshas*. Hypertension is nothing but increased pressure in the blood vessels. It occurs when the *Sara Guna* of *Rakta* has been increased. *Chala Guna* is mainly due to *Vata Dosha*, and *Pitta* has *Sara Guna*, and it has the *Ashraya* in *Rakta Dhatu* thus *Pitta* is involved too. Thus, *Prakupita Vata* and *Pitta* are known to play an important role in hypertension. Few scholars consider the involvement of *Kapha* in the manifestation of atherosclerosis and increased levels of LDL and triglycerides. But it should be taken into consideration that the increased level of LDL and triglycerides is mainly due to deranged metabolism which is mainly due to deranged *Pitta* and *Agni*. Thus, *Vata* and *Pitta* are the main doshas involved in the pathology of essential hypertension. The treatment of *Vyanabala Vaishmyam* includes *Shodana Chikitsa* and *Samana Chikitsa*. In *Shodana*, *Virechana* can be done. *Samana Chikitsa* includes *Bahya* and *Abhyantara Chikitsa*. In *Bahya Chikitsa*, *Shiro Dhara* can be done. In *Abhyantara Chikitsa*, the formulations like *Sarpagandha Ghana Vati*, *Shankapushpyadi Ghana Vati*, *Arjuna Ksheerapaka*, *Brahmi Vati*, *Chandraprabha Vati*, *Gokshuradi Guggulu* can be used. Single drugs like *Sarpagandha*, *Arjuna*, *Shankhapuspi*, *Gokshura*, *Punarnava*, *Brahmi*, *Jatamansi*, *Vacha* etc can be used. *Chandraprabha Vati* and *Gokshuradi Guggulu* are used for their diuretic action to excrete excess sodium.

MODE OF ACTION OF VIRECHANA:

Vatapitta Prakopa along with *Rakta Dusti* is the main pathology in *Vyanabala Vaishmyam*. Thus,

Virechana is the main *Shodana Chikitsa*. In *Charaka Samhita Vata Vyadhi Chikitsa Adhyayam*, it is also mentioned that if *Vata* associated with *Pitta* pervaded the whole body, then *Virechana* is indicated (16). *Virechana* may aid in sodium excretion and can reduce the intravascular volume and thus can reduce essential hypertension. It may also reduce oxidative stress by eliminating the free radicals. *Nitya Mrdu Virechana* can be administered daily or a proper *Virechana* can be done before the administration of *Shamana Chikitsa*. It also helps to relieve the *Avarana* of *Vata Dosha* if any.

MODE OF ACTION OF SHIRO DHARA:

Shiro Dhara is one of the commonly practiced treatments for essential hypertension. Stress is one of the main causative factors for essential hypertension. Thus, *Shiro Dhara* can be used. It is *Mana Prasadaka*. It may reduce sympathetic stimulation. *Takradhara* is also traditionally practiced. *Takra* used for *Dhara* is medicated with *Musta* and *Amalaki Kashaya*.

SARPAGANDHA GHANA VATI:

It is mentioned in *Siddhayoga Sangraha Unmada Roga Chikitsa*. The ingredients of *Sarpagandha Ghana Vati* are *Sarpagandha*, *Khurasika Yavani*,

Jatamansi, *Bhanga*, and *Pippalimula*. *Sarpagandha* is known for its hypotensive action and has *Nidrajanaka* property (17) and reduces sympathetic stimulation by binding to the catecholamine storage vesicles in the nerve cell. *Khurasika Yavani* possesses *Nidrajanana* and *Madakari* properties (18) and may reduce the raised blood pressure by decreasing the sympathetic outflow. *Jatamansi* also possesses *Rasayana*, and *Medhya* properties (19) and may decrease the sympathetic outflow and *Rasayana* property may prevent arteriosclerosis. It is anti-arrhythmic and hypotensive (20). *Bhanga* possesses *Madakari*, *Vrshyam*, and *Nidrajanana* properties (21) and may aid in reducing blood pressure by decreasing the sympathetic outflow. It is cardioprotective and causes coronary vasodilation. The slow and prolonged hypotensive action of Cannabis has been proved in animal studies (22). *Pippalimoola* possesses *Vrshya*, and *Rasayana* properties (23). Isolated Dehydrated piperonaline is a coronary vasorelaxant.

SHANKAPUSHPYADI GHANA VATI (24):

It is an *Anubhoot Yoga* and is commonly practiced research articles have been published on this formulation and found to be effective in hypertension.

Table 01:

S.NO	INGREDIENTS	QUANTITY
1.	<i>Shankhapushpi</i>	11/2 Part
2.	<i>Brahmi</i>	11/2 Part
3.	<i>Guduchi</i>	1 Part
4.	<i>Aragvadha</i>	1 Part
5.	<i>Nimba</i>	1 Part
6.	<i>Kusta</i>	1 Part
7.	<i>Vacha</i>	¼ Part
8.	<i>Gokshura</i>	¾ Part

The ingredients of *Shankapushpyadi Ghana Vati* are *Shankhapushpi*, *Brahmi*, *Guduchi*, *Aragvadha*, *Nimba*, *Kusta*, *Vacha*, and *Gokshura*. *Shankhapushpi*, *Guduchi*, and *Brahmi* have *Medhya* properties and may decrease sympathetic stimulation. *Brahmi*, *Shankhapushpi*, *Guduchi*, and *Gokshura* possess *Rasayana* properties and may prevent arteriosclerosis. *Gokshura* and *Guduchi* have *Mutrala Guna* which

may excrete the excess sodium. *Nimba*, *Vacha*, and *Kusta* may have the *Lekhana* property which may reduce lipid levels, and atherosclerosis. *Kusta* and *Aragvadha* have *Rechaka* properties and may reduce the excess sodium and intravascular volume and help in the reduction of blood pressure. *Vacha* is especially mentioned in *Smruthi Hrasa* which can be correlated to dementia in chronic hypertensive cases due to deposition of beta-amyloid. *Vacha* having *Lekhana*,

Medhya property which is specially indicated in *Smruti Hrasa* can be used.

ARJUNA KSHEERAPAKA:

Arjuna Ksheerapaka or *Arjuna Tvak Churna* with milk is mentioned in *Hrdroga Chikitsa* mentioned in *Bhaisajya Ratnavali*. It is gaining recent popularity in the management of essential hypertension. It is *Hrdya Prabhavam*, antioxidant, and hypotensive action and reduces the lipid level (25) which plays an important pathology in essential hypertension. *Arjuna Ksheerapaka* is commonly used, and it can be used in *Kashaya* form also. It is also used in combination with *Vacha* and *Brahmi* as *Arjuna Vachadi Yoga* and is found to be significant in reducing hypertension.

BRAHMI VATI:

Brahmi Vati is mentioned in *Ayurveda Sara Sangraha* in *Vati Prakarana*. It contains *Brahmi*, *Sankhapushpi*, *Gojihva*, *Vaca*, *Swarna Makshika*, *Rasa Sindoor*, *Krishna Maricha*, *Jatamansi*. *Brahmi* possesses an anxiolytic effect, cardiac depressive activity on left ventricular contractility (26). *Rasa sindoor* has an antihypertensive effect (27). *Vacha* possesses a calcium inhibitory effect and may reduce the vasoconstriction of smooth muscles and has diuretic property and thus facilitate excess sodium excretion (28).

DISCUSSION

In this review article, the pathophysiology of essential hypertension and its ayurvedic understanding which is equivalent to *Vyanabala Vaishamyam* has been explained. *Vyanabala Vaishamyam* is mainly due to *Vata*, *Pitta*, and *Rakta Dushti*. Since contemporary medicine has many side effects, *Ayurvedic* management as an alternative and supportive management has been explained in this article. Mainly, the *Ayurvedic* management includes *Shodana* and *Samana Chikitsa*. *Shareera Shodana* is achieved through *Virechana* and the *Samana Chikitsa* includes *Bahya* and *Abhyantara Chikitsa*. *Bahya Chikitsa* includes *Shirodhara*. *Abhyantara Chikitsa* has compound formulations such as *Sarpagandha Ghana Vati*, *Shankhapushphyadi Ghana Vati*, *Brahmi Vati*, *Arjuna Ksheerapaka*, *Chandraprabha Vati*, and *Gokshuradi Guggulu*. Most of the drugs act by decreasing sympathetic stimulation,

excreting the excess sodium, reducing heart contractility, and vasodilation. The treatment should also include reduced salt intake, avoiding oily foods, alcohol, smoking, and being physically active.

CONCLUSION

In this competitive era, Essential Hypertension is one of the major lifestyle disorders which may lead to stroke, CHD, coronary artery disease, renal injury, and encephalopathy. Since contemporary medicine is associated with serious side effects and at times uncontrolled in spite of medications, the *Ayurveda* comes to the rescue. The treatment protocol should include both *Shodana* and *Samana Chikitsa*. *Virechanam* is done and followed with *Shiro Dhara* and the internal medications. The compound herbal and herbo-mineral compound not only possess hypotensive action but has cardiogenic, hypolipidemic, anxiolytic, and antioxidant properties. Thus, the pathology is counteracted from the roots. *Ayurveda* management along with the proper lifestyle and dietary management is very promising in the management of essential hypertension.

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