



## THE ROLE OF VYANA VAYU AS AN INFLUENCING FACTOR IN THE DEVELOPMENT OF HYPERTENSION W.S.R. TO AYURVEDIC PERSPECTIVE

<sup>1</sup>Rainu Chauhan, <sup>2</sup>Babita Sharma

<sup>1</sup>MD Scholar, Dept. of Kriya Sharir, Pt. Khushilal Sharma Govt. Ayurveda Institute, Bhopal (MP).

<sup>2</sup>Associate Professor, Dept. of Kriya Sharir, Pt. Khushilal Sharma Govt. Ayurveda Institute, Bhopal (MP)

Corresponding Author: [renuchauhan036@gmail.com](mailto:renuchauhan036@gmail.com)

<https://doi.org/10.46607/iamj0312082024>

(Published Online: August 2024)

### Open Access

© International Ayurvedic Medical Journal, India 2024

Article Received: 08/07/2024 - Peer Reviewed: 29/07/2024 - Accepted for Publication: 14/08/2024.



## ABSTRACT

The human body is composed of *Dosha Dhatu* and *Malas*. Three physiological elements, Vata, Pitta, and Kapha, regulate movement, transformation, and growth, respectively, and contribute to overall health. *Doshas* in their equilibrium state are important to maintain health. Any derangement in this *Tridoshas* leads to diseases. Out of the three *Doshas* pitta, kapha, and all other constituents, *Charaka* has described the five *Vata Dosha* kinds (*Prana Vayu*, *Vyana Vayu*, *Udana Vayu*, *Samana Vayu*, and *Apana Vayu*). out of which the *Vyana* type of *Vata Dosha* controls every major and minor movement of the body in the form of flexion, extension, abduction, etc. *Vyana Vayu* not only controls musculoskeletal movements but also cardiac muscle activities. *Vyana Vata* is described as *Mahajava*, which is highly powerful. Therefore, it keeps the *Rasa Dhatu* in circulation continuously and always throughout life. *Vyana Vayu*, with its swift action, performs all the functions in the body. While all three of the *Doshas* inhabiting *Hridaya* play a part in the bodily functions, *Vyana Vayu* plays a special role in executing the various bodily processes while in *Hridaya*. Any obstruction to *Vyana Vayu* leads to a disease that affects the whole body. Vitiation of *Vyana Vayu* hampers its functions as well as nutrition and movements of the body. This *Vyana Vayu* controls the reflex activities and intellectual action of the heart. It helps in the circulation of blood by becoming a prevalent part of people's lifestyle. The most prevalent lifestyle disorder in today's world is hypertension. Hypertension is a chronic and often asymptomatic medical condition in which systemic arterial blood pressure is elevated beyond normal. So,

the forthcoming paper will provide a thorough analysis of Vyana Vayu and explain how it may have an impact on the onset of hypertension.

**Keywords:** Hypertension, Ayurveda, Vyana Vayu, Tridoshas, Blood pressure

## INTRODUCTION

Tridosha is the basic concept of Ayurvedic physiology. Tridoshas are Vata, Pitta, and Kapha. In tridosha, vata has a dominant factor. A separate chapter has been devoted to Caraka Samhita to explain its importance.<sup>[1]</sup> All five types of Vayu, i.e., Prana, Udana, Samana, Apana, and Vyana, perform their separate functions in coordination to maintain the normal functioning of the human body.

Vyana Vayu is considered to be present all over the body, regulating various body movements and circulatory functions related to body fluids, including blood. The active site of "Vyana Vata" is the heart; it makes the circulation of blood possible by controlling the heart.<sup>[2]</sup>

Vyana makes Rasa (the intravascular fluid including plasma and lymph) get forcefully ejected out of the heart and makes it circulate throughout the body. Under "Vyana Vayu," the parasympathetic and sympathetic nervous systems of the heart should be included.<sup>[2]</sup>

देहं व्याप्नोति सर्वं तु व्यानः शीघ्रगतिर्नृणाम्।  
गतिप्रसारणाक्षेपनिमेषादिक्रियः सदा॥ (p0 fp0  
28@9)

Vyana Vayu, being quick-moving, pervades the entire body and performs the functions of movements, extension, contraction, blinking, etc. By contracting and relaxing the heart, Vyana Vayu moves blood from the heart to the body's tissues and maintains proper blood pressure.

According to the Ayurvedic classics, vitiation of Vayu (Vyana Vayu), caused by a variety of causative factors and pathological states, disturbs the Gati of Rakta. So, causing an increase in blood pressure, which is termed hypertension. Hypertension is also known as high blood pressure or raised blood pressure. In Ayurveda classical texts, a clearcut description of hypertension is not available.

According to reports, the third-ranking factor for disability-adjusted life years is high blood pressure, or hypertension. The prevalence of HTN has increased over the last few years, and this needs to be taken seriously. It is possible to modify a number of risk factors for high blood pressure (HTN), including dietary practices, alcohol consumption, smoking, altering lifestyles, being overweight, etc. But other aspects are unchangeable, including age and genetic predisposition. The public health of both developing and non-developing countries is seriously threatened by HTN. It is known as the "silent killer" since most HTN sufferers are not aware of the issue because there may be no warning signs or symptoms. HTN doubles the risk of cardiovascular diseases, including CHD, CHF, ischemic and hemorrhagic stroke, renal failure, and peripheral arterial disease.<sup>[3]</sup> Around 7.5 million deaths, or 12.8% of the total of all annual deaths worldwide, occur due to high blood pressure. It is predicted to increase to 1.56 billion adults with hypertension in 2025.<sup>[4]</sup>

## PREVALENCE:

Hypertension is an important world-wide public health challenge and remains a major cause of morbidity and mortality worldwide. In India, hypertension is responsible for 57% of stroke deaths and 24% of all coronary heart disease deaths.<sup>[5]</sup> Worldwide, high blood pressure is estimated to cause 7.1 million deaths, or about 13 percent of the global fatality total. In an analysis of worldwide data on hypertension, 20.6% of Indian men and 20.9% of Indian women were suffering from hypertension in 2005.<sup>[6]</sup> According to the WHO 2008 estimates, the prevalence of raised blood pressure in Indians was 32.5% (33.2% in men and 31.7% in women).<sup>[7]</sup> In India, more than 200 million adults are estimated to have high blood pressure.<sup>[8]</sup> Recent studies from India have shown the prevalence of hypertension to be 25% in urban areas and 10% in

rural areas of India. [9] We found a high prevalence of hypertension among young adults (20–44 years old). A survey performed in Kerala State, India, reported an estimated prevalence of hypertension ranging between 15.3% in women and 30.5% in men and women aged between 20 and 29, and 25.8% and 37.7% in those aged between 30 and 39 years old, respectively. [6] From the above data, we can conclude that there is an urgent need to prevent and manage hypertension.

#### AIMS AND OBJECTIVES:

1. To Describe disease hypertension in terms of *Ayurveda*.
2. To determine and identify contributory factors of Hypertension from *Ayurveda* perspective, and to explain the Pathophysiology of Hypertension in *Ayurveda*.
3. To understand the concept of relation between *Vyana Vayu* and affecting factors that influence blood pressure.

#### MATERIALS AND METHODS:

To study causes, signs and symptoms resembling hypertension with *Ayurvedic* Perspective, classical book of *Ayurveda*, especially *Brihatrayi*, modern literature, available research scientific information available on internet etc were searched and analysed.

Name	Name of Acharya
<i>Raktagata vata</i>	Y.N. Upadhyaya
<i>Shiragata vata</i>	G.N. Chaturvedi
<i>Avritta vataroga</i>	R.K. Sharma
<i>Vyana Bala</i>	Triguna B.
<i>Dhamani Prapurnata</i>	A.D. Athavale
<i>Dhamani pratichaya</i>	Athawale A.D.
<i>Raktavata</i>	Sharma P.V.

According to *Acharya Charaka*, in the case of an unknown disease, the physician should try to understand the nature of the disease through the *Dosha*, the site of manifestation, and etiological factors, and then initiate the treatment. So, it becomes necessary to study the factors that are involved in hypertension.

#### FACTORS INVOLVED IN HYPERTENSION:

1. **Prana Vayu-Hridaya Dhruka**, which means the *Dharana* of the heart, is the typical function of *Prana Vayu*. It can be correlated with the vagal inhibition of

#### LITERATURE REVIEW:

##### Modern Review-

**Hypertension:** “Hypertension is defined as systolic blood pressure of 140 mm of Hg or greater and diastolic blood pressure (DBP) of 90 mm of Hg or greater, based on the average of two or more properly measured, seated BP readings on each of two or more visits. [10]

**Types of Hypertensions-** There are two types:

1. **Primary or essential hypertension** has no clear underlying cause but appears to be the result of the interplay of complex genetic and environmental factors.
2. **Secondary hypertension** is caused by a specific underlying mechanism, usually involving the kidneys or endocrine system.

**Ayurvedic Review** There is no direct reference to hypertension in *Ayurvedic* classical texts. Relevant references regarding hypertension, as indicated in those texts, have therefore been classified by eminent *Acharyas*. In *Ayurveda*, various luminaries have given their opinion to coin the name of a disease and to better understand it. Some of them are: [11].

the nervous system. [12] The autonomic nervous system regulates blood pressure through the vasomotor center. Similar to how *Vyana Vayu* is controlled, *Prana Vayu* also regulates blood pressure. Thus, through the development of hypertension, Diseases caused by *Prana Vayu* may be due to abnormalities in the heart and blood vessels

2. **Vyana Vayu:** *Vyana Vayu* is said to be responsible for various kinds of movements in the body. [13] With the assistance of *Vyana Vayu*, the heart beats and pumps blood (*Rasa Rakta Dhatu*) throughout the body.

Vyana Vayu also controls the heart's ability to dilate and contract the arteries. Thus, it implies that Vyana Vayu is involved in blood pressure regulation.

**3. Samana Vayu:** According to Sharangadhara, after the digestion process, 'Samana Vayu' helps in the transportation of Rasa into the heart, and from there, it circulates in the whole body.<sup>[14]</sup> Thus, Samana Vayu has an important role in its circulation.

**4. Apana Vayu:** Vitiating of the Apana Vayu hampers the excretion of the Purisha and Mutra, affecting homeostasis, which may affect blood pressure. From the above facts, it can be concluded that Apana Vayu also plays a role in the regulation of normal blood pressure.<sup>[15]</sup>

**5. Sadhaka Pitta-**It is difficult to explain Sadhaka Pitta in terms of modern physiology, however functions of adrenaline do possess some similarity with that of Sadhaka pitta.<sup>[15]</sup> In cases of fear, anger and such other feelings, the adrenal gland is stimulated and increases the secretion of adrenaline, which in turn affects the heart rate and cardiac output, and ultimately raises the blood pressure. Thus, Sadhaka Pitta can be considered as an important factor in the normal physiology of blood pressure.

**6. Avalambaka Kapha-** Avalambaka Kapha, residing in the cardiovascular system, ensures smooth transport of Rasa-Rakta through blood vessels. When it vitiates, it causes the sticking of lipids in the cardiovascular system. This augments peripheral resistance and leads to the manifestation of hypertension. Kapha vitiating may influence the viscosity of blood. increased viscosity can cause hypertension.

**7. Role of Rasa Dhatu in the manifestation of hypertension** -Hridaya and ten Dhamani are described as Mula of Rasavaha Srotas. The cardiovascular system is the main system affected by hypertension. In Hrudroga (heart diseases), the main Dhatu affected is Rasa. These facts support the vitiating of Rasa and Rasavaha Srotas in hypertension.<sup>[16]</sup>

**8. Role of Rakta Dhatu in the manifestation of hypertension** - As per Acharya Sushruta, the Mulaasthan (origin) of Rasavaha Srotas is Rakta Vahini Dhamani (Vascular System). The symptomatology of Raktavaha Srotodushti, as per Acharya Charaka, closely

relates to the symptoms of hypertension.<sup>[17]</sup> These disorders closely resemble the diseases Mada, Murchha, and Sanyasa, which are described in the Vidhisonitiya Adhyaya of Charaka Samhita. The Srotas vitiates in these disorders are Rasavaha, Raktavaha, and Samgyaavaha Srotas.<sup>[18]</sup> This supports the affection of Raktavaha Srotas in association with Rasa and Manaovaha Srotas in hypertension.

**9. Role of Medo Dhatu and Medovaha Srotas in the manifestation of hypertension** -The function of the Medovaha Srotas is closely related to the lipid metabolism. Abnormal lipid metabolism such as hypercholesterolemia, decreased HDL, increased triglyceride, and increased LDL bring about endothelial dysfunction and atherosclerosis, leading to the manifestation of hypertension.<sup>[19]</sup> This Srotas is affected due to a lack of physical exercise, daytime sleep, excessive intake of fatty, oily foods, and excessive alcohol intake.

**मेदोवाहीनि दुष्यन्ति वारुण्याश्चातिसेवनात् (च.वि.5/16)**

#### Etiopathogenesis

excessive intake of snigdha, guru ahara with day sleep  
→ Shonita dusti → Ati Snigdha, Guru Ahara, excessive alcohol intake causes → Jatharagni Vaigunya Medodhatvagni mandhya leads to production of Ama (Apakva rasadhatu) and Apakva → Medovridhi Apakva meda and rasa when deposits in Rasavaha Srotas may lead to Dhamani Praticaya (Atherosclerosis) → increase high blood pressure.

**11. Role of Mana (Mind) and Manovaha Srotas in the manifestation of hypertension** -There is a close interrelation between the body and mind (Mana). Manasik Bhavas like Krodha (anger), Chinta (worry), Bhaya (fear), etc. play an important role in the pathogenesis, progression, and prognosis of all diseases. Modern medical science also considers that the involvement of the psyche (Mana) can be a causative factor for hypertension. People exposed to repeated psychogenic stress have a greater tendency to develop hypertension. Stress activates the sympathetic nervous system directly, and sympathetic overactivity in turn interacts with high sodium intake, rennin-angiotensin, and insulin resistance to mediate the pathogenesis of hypertension.<sup>[20]</sup>



**12. Agni-** The normal formation of *Rasa* and *Rakta* occurs when *Agni* is *prakout*. *Agni* is an important aspect of *Ayurveda* as all the state disease or health revolves around the state of *Agni*. There are mainly 3 types of *Agni* which are *Jatharagni*, *Dhatavagni* and *Bhutagni* rely on *Jatharagni*. *Jatharagni* digests the food, and after digestion, food will result in the formation of '*Prasad Bhaga*' and '*Mala Bhaga*'. When there is a state of *Agnimandya* the digestion will end in the formation of *Ama*. This *Ama* will cause *Srotoavrodha* and vitiation of all *Dosha*. It will increase peripheral resistance and can lead to *Hypertension*.<sup>[21]</sup>

#### **SAMPRAPTI (PATHOGENESIS OF HYPERTENSION IN AYURVEDA):**

The pathogenesis of hypertension takes place at both the physical and psychic levels, one at a time or simultaneously, depending on the *Dosha Dushya Sammurchhana*. At the physical level, the *Vata Pradhana Tridosha* becomes vitiated as a result of etiological factors. Simultaneously, due to the *Dhatuvaishmyakara* properties of the etiological factor *Agnidushti*, *Dhatudushti* (*Rasa* and *Rakta*) and *Ama* production occur, leading to *Khavaigunya* (obstructive pathology in channels). The *Ama* production results in *Strotorodha* (*Rasvaha* and *Raktavaha*) and thus blocks the normal circulation of *Vyana Vayu*, resulting in *Margavarodha*. This obstructed *Vyana Vayu* leads to forcible blood flow in the blood vessels, causing increased resistance. thereby increasing BP.<sup>[22]</sup>

#### **SAMPRAPTI GHATAKA (Factors in pathogenesis):**

- *Dosha -Vata (Prana, Vyana, Apana) pitta (Sadhaka) Kapha (Avalambaka)*
- *Dushya -Rasa, Rakta, Meda*
- *Agni -Jatharagni MandhyaJanita Ama, -Rasa, Rakta Dhatvagni janita Ama,*
- *Srotasa -Rasavaha, Raktavaha, Manovaha*
- *Srotodusti -Sanga type of srotorodha*
- *Udbhavasthana -Aamashaya*
- *Roga Marga - Madhyama*
- *Sancharisthana -Sarwang Sharira*

- *Vyaktasthana - Sarwang Sharira*
- *Adhithana - Dhamani, Sira, Sarwang Sharira*
- *Vyadhi Swabhava -Aashukari/Chirakari*

#### **CO-RELATION OF AYURVEDIC DISEASES WITH HYPERTENSION:**

HNT can be related to many of the diseases mentioned earlier. Comparison of these diseases on the basis of symptomatology is given below.

**Raktagata Vata:**<sup>[23]</sup> The symptoms like *Santapa* (irritability), *Aruchi* (anorexia), and *Bhrama* (giddiness) are commonly found in *Raktagata Vata* and HTN.

**Siragata Vata:**<sup>[24]</sup> Symptoms of *Siragata Vata* like *Mandashotha* (mild oedema), *Sirapurnata* (increased volume in blood vessels), *Sira Spandan* (increased pulsation in blood vessels), etc. can be correlated with HTN.

**Raktaviddhi:**<sup>[25]</sup> The symptoms of *Raktaviddhi*, like *Raktapitta* (bleeding disorders), *Tamapravesha* (fainting), *Raktanetra* (redness of the eyes), and *Sirapurnata*, are found to be identical with those of HTN.

**Avritta Vata:**<sup>[26]</sup> The symptoms of *Pittavritta Vata*, viz., *Daha* (burning sensation), *Bhrama*, *Tama*, etc., are said to be present in HTN. *Bhrama*, *Avasada* (exhaust), *Daurbalya* (fatigue), etc. symptoms of *Pittavritta Udana* and *Shwasa* (dyspnoea), *Hridroga* (cardiac disorder), etc. symptoms of *Pranavritta Udana* are found to be similar to EHT. Furthermore, the symptoms like *Shotha* are also present in EHT.

**Raktashrita Vikara:** The list of *Ratkashrita Vikaras* quoted at *Vidhisonitiya Adhayaya* of *Charaka Samhita* consists of 41 diseases. If one concentrates on these symptoms, a surprising similarity between the symptoms of EHT and *Ratkashrita Vikaras* can be observed. Sinking This can be grouped as follows:<sup>[27]</sup>

S.NO.	Symptoms of Raktadushti	Symptoms of EHT
1.	<i>Shirashula</i>	Headache
2.	<i>Tamodarshana</i>	Fainting / Blackouts
3.	<i>Tandra</i>	Drowsiness
4.	<i>Gurugatrata</i>	Heaviness in body
5.	<i>Atidaurbalya</i>	Fatigue
6.	<i>Klama</i>	
7.	<i>Krodhaprachurata</i>	Anger
8.	<i>Buddhisammoha</i>	Decreased memory power
9.	<i>Mada</i>	Irritability
10.	<i>Santapa</i>	
11.	<i>Agnisada</i>	Anorexia
12.	<i>Aruchi</i>	
13.	<i>Tiktamlodgara</i>	
14.	<i>Akshiraga</i>	Retinal haemorrhage
15.	<i>Pramilaka</i>	Blurring vision

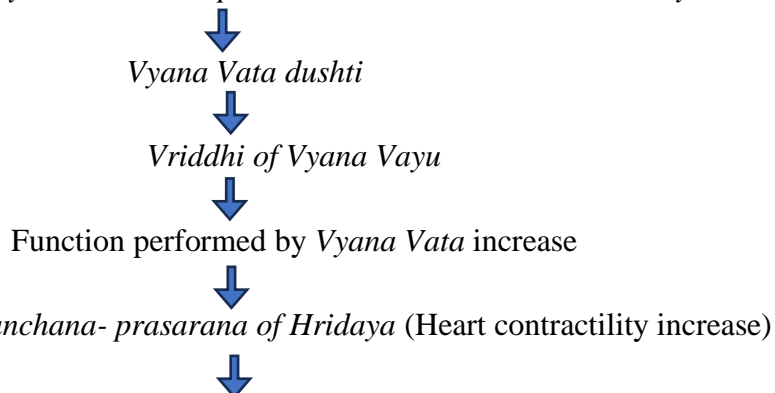
### ETIOLOGICAL FACTORS OF HYPERTENSION:

Essential hypertension is idiopathic, where the exact etiology of the rise in blood pressure is not yet clear. There are many predisposing factors that cause hypertension: *Madhyapana*, excessive *Lavana* intake, sedentary lifestyle (*Atisnigdha*, *Madhura*, *Ahara*, *Divaswapna*), mental stress (*Krodha*, *Bhaya*, *Shoka*), physical strain (*Shrama*), seasonal variation (*Ritu sandhi*), *Beeja Dusthi.*, *Nidanarthaka Rogas-Madhumeha*, *Sthoulya*, *Hridroga*, *Vrikka Roga*, etc. (*Charaka Samhita, Sutrasthana 24/7-10*).

### FACTORS AFFECTING BLOOD PRESSURE:

These include Cardiac Output, Peripheral Resistance, Vessel Elasticity, Blood Volume, Viscosity of blood.

Consumption of food items or performing activities that lead to vitiate *Vyana vayu* (*Ati marga gamana*, *vishama cheshtaye*, *virodhi annapanna*, *ati ruksha anna sevana*, *bhaya*, *chinta shoka*).<sup>[31]</sup>



### Probable correlation of Ayurvedic and modern pathophysiology of Hypertension<sup>[28]</sup>:

#### Cardiac Output-

##### ➤ Due To Action of Vyana Vayu

*Vyana Vayu* is said to be responsible for controlling and conducting all the activities in the body.<sup>[29]</sup> The heart generates electrical impulses on its own, which makes the heart contract during the systole as it has its pacemaker (SA node). The heart's self-excitatory function can be attributed to the functioning of the *Vata Dosha*. *Charaka* clearly describes that *Vyana Vayu* persistently forces the blood out of the heart and distributes it throughout the body.<sup>[30]</sup>

*Hridaya Rakta Ayatana Nirgmana Viddhi* (Cardiac output increases)



*Damini pratirodha viddhi* (pressure exerted by blood on vessels increase)



Rise in blood pressure (Hypertension)

### Peripheral Resistance –

*Vyana Vayu* is responsible for the circulation of *Rakta* in blood vessels throughout the whole body, from the heart. Any change in the morphology of the blood vessel or disturbance in the normal flow of blood in the blood vessel will result in a change in the pressure

applied by blood to the blood vessels.<sup>[28]</sup> *Aahara* consumed by us is converted into two parts by *jatharagni*: one is the formation of the first *Dhatu*, which is *Rasa Dhatu*, and secondly, *mala bhaga*. Due to *Manda Jatharagni*, there is a probability of the formation of *Ama* in *rasa Dhatu*.<sup>[32]</sup>

*Rasa, Kapha, and Medo Vardhaka Aahara-vihara* (excessive consumption of *madhura, amla, lavana rasa, snigdha, guru, and Abhishyandi bhojana, aasyasukha, swapnasukha, diwaswapna*)



*Agnimandya*



Formation of *Ama Rasa Dhatu*



Deposition of *Kapha, Meda* on wall of blood vessels



*Dhamani pratichaya* (Decrease lumen of blood vessels)



Hampers Normal flow of blood in blood vessels



Increase resistance by blood on wall of blood vessels



Increase in blood vessels



Increase in blood pressure

### ➤ Due to *Vata-Ruksha Guna Vriddhi*

*Vata vardhaka aahara-vihara*



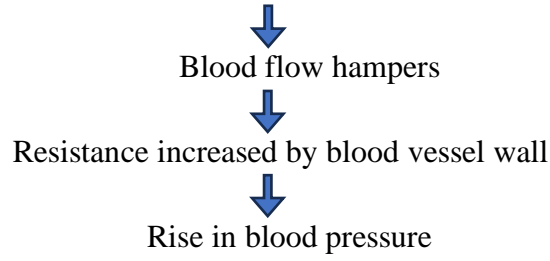
*Vata dushi*



Due to *vriddhi in ruksha guna of vata*



Stiffness in blood vessels



### Elasticity of blood vessels-

*Siras* and *Dhamanis* are made of *Mamsa Dhatu* and *Meda Dhatu*. Due to *Kapha-Mamsa* or *Meda Prakopak Hetusevan*, *picchila guna* increases. It causes *Upalep* to vessel walls, which causes *Strotorodh* and causes hypertension. [33]

### Volume of circulating blood-

The blood volume can be determined by the quality and quantity of *Rasa* and *Rakta Dhatu*, which also determine the cardiac output. Blood pressure rises as a result of *Rasa* and *Rakta Vriddhi* producing *Gouravata* and *Sirapurnata* in the circulatory channels. Water balance is maintained by the *Samana Vayu*, controlled by the *Prana Vayu*, and also determined by the *Apana Vayu*. [34] रक्तं सिरापूरुणत्वं च (S.Su.15/14)

**Engorged Blood Vessels** - Engorgement of blood vessels due to the accumulation of blood in them can be called *Sirapurnatva*. *Sira* are the blood vessels through which blood flows. Engorgement of blood vessels indicates a high **volume of blood**; hence, it is a symptom of *Rakta-Vriddhi*. [35] Bulging veins can occur due to temporarily rising blood pressure and body temperature.

### Viscosity of blood-

The viscosity of blood partly determines resistance to blood flow through small vessels. Decrease in द्रवत्व due to पिच्छिल substances (like साम दोष, विशयदित कफ etc.). Increase गुरुत्व and सांद्रता of blood. लघुता which is आकाशीय property of *Rakta* will be lost, resulting in an increase in *Vyana* activities to meet the metabolic needs of the tissues (धातुतर्पण). [36]

## DISCUSSION

The function of *Vyana Vata* is mainly blood circulation, so *Vyana Vayu* is the main causative factor for the occurrence of hypertension. Vitiating of *Vyana*

*Vayu* can be either by its own *Prakopa* due to etiological factors for *Vata* or may be impaired by the influence of other *Doshas* and *Dhathus*. Hypertension is defined as a chronic elevation in arterial blood pressure (BP) > 140/90 mmHg with no definable causes. The various genetic and environmental factors interact with each other and influence the pathogenesis of this condition. The main determinants of blood pressure, as seen earlier, are cardiac output and peripheral resistance. Cardiac output is determined by stroke volume and heart rate. So, for an increase in blood pressure, there should be an increase in either cardiac output or peripheral resistance. Blood pressure is known as the pressure exerted by blood on vessel walls while passing through them. [33] It is dependent on three factors. 1. Flow or “*Gati*” of blood 2. Density of blood 3. Elasticity of blood vessels.

**1. Gati of blood:** All over the body, the blood is circulated with uniform *Gati*. [37] To eject blood from the heart and circulate it through the body is performed by *Vyana Vayu*. *Vyana Vayu* continues his work without taking rest and avoiding the disturbances caused by other *Mahabhutas*. Hence, to maintain “*Gati*” *Vyana Vayu* should be taken into consideration.

**2. Density of blood (*Rakta Ghanata*):** Decreased fluidity of blood leads to increased density of blood, which affects the flow of blood, which increases the stagnancy of blood into vessels. Hence, the heart has to increase pressure to overcome this. Increased fluidity also results in increased blood pressure.

**3. Elasticity of blood vessels:** Blood pressure is inversely proportional to the elasticity of blood vessels. Due to their elastic properties, the blood vessels are distensible and are able to maintain pressure. When the elastic property is lost, the blood vessels become rigid, and pressure increases. The increased blood pressure seen with aging is most likely related to arterial changes, as aging results in the narrowing of the vessel



lumen and stiffening of the vessel walls through a process known as atherosclerosis. It is the hardening and thickening of arteries due to the formation of fat and fibrin deposits within the arterial tissue. Due to the thickening of the vessel wall as arteriosclerosis leads to a decrease in elasticity, increased resistance tends to cause an increase in blood pressure. It is a naturally occurring phenomenon due to the aging process. This damage leads to the formation of plaques inside the arteries. Aging is due to the action of Vata dosha, as it had dominance in old age. Our body starts degenerating and exhibits the weakening and wasting of tissues. The ability to rejuvenate cellular tissue is impeded due to a decline in cellular metabolism. **Ayurveda classifies** atherosclerosis as “Sanga” which is a disorder of Kapha origin affecting Vyana Vayu in Raktavaha Srotas. The causative factor being Kapha affects Meda Dhatu-adipose tissue, particularly the Meda Dhatu Agni-metabolism at the level of adipose tissue. Increased Meda dhatu formation begins to deposit in the Raktavaha srotas, blocking the flow of Vyana Vayu. This results in high blood pressure and Kapha dusti. [38]

**Concept of Avarana in hypertension:** This concept of Avarana on the normal functioning of Vayu also plays a major role in the Samprapti vighnana of hypertension. [39] Increased hormonal and enzymal action, changes in the chemical constituents in the blood, and atherosclerotic changes in the arteries due to lipid deposition. [40] decreased sodium excretions, [41] in hypertension can be considered under the pathologies of Anya-dosha avarana. [28] Another type of Avarana samprapti takes place when there is Anyonya-Avarana in Vayu. The subtypes of Vayu, such as Vyana and Prana Vayu occlude each other and cause the disease. [41] The normal functioning of Prana Vayu, which is situated in the head, gets disturbed due to factors like stress, and it is not able to move properly in its body channels. When the disturbed Prana Vayu obstructs the path of Vyana Vayu, the autonomic functions of Vyana Vayu are disturbed. An increased tone of the sympathetic nervous system produces catecholamines that increase blood pressure, and this process can take place due to stress. [42]

### Avarana and clinical feature found in hypertension-

Avaraka	Avrita	Clinical Feature	Reference	Modern Perspective
Pitta	Vyana	Daha, Klama, Santapa Daha, Klama	Ch.Chi.28/227-228 Su.Ni.1/38	Burning sensation Fatigue, Irritability
Pitta	Prana	Murchha, Daha, Bhrama	Ch.Chi.28/221	Fainting, Burning sensation, Giddiness
Pitta	Udana	Murchha, Klama Murchha, Daha, Klama	Ch.Chi.28/222 Su.Ni.1/35	Fainting, Fatigue, Burning sensation
Shleshma	Udana	Daurbalya, Gurugatrata	Ch.Chi.28/224-225	Weakness, Heaviness of body
Kapha	Prana	Nihishwasa-Uchhavaasa Sangraha	Ch.Chi.28/223	Obstruction to inspiration & expiration
Kapha	Vata	Gaurava Shopha, Guruta	Ch.Chi.28/62 Su.Ni.1/33	Heaviness, Swelling
Pitta	Vata	Daha, Trishna, Bhrama, Tama Daha, Santapa, Murchha	Ch.Chi.28/61 Su.Ni.1/32	Burning sensation Thirst, Giddiness, Irritability, Fainting
Rakta	Vata	Daha, Swayathu Prasuptata	Ch.Chi.28/64 Su.Ni.1/33	Burning sensation, Swelling
Meda	Vata	Adhyavata (prone to EHT)	Ch.Chi.28/66	Stiffness

## CONCLUSION

Vyana Vayu is a type of Vata Dosha that executes the functions of all other types of Vata Dosha. Out of all functions of Vyana Vayu, Rasa Rakta Vikshepana (circulation of Rasa and Rakta dhatu) is the most important function. Vyana Vayu not only controls blood circulation but also local blood flow to the tissue. Blood pressure regulating factors such as cardiac output, peripheral resistance, and heart rate are controlled by Vyana Vayu. According to modern medicine, blood pressure, vasoconstriction, vasodilation, sweating, and blood flow to tissue are controlled by the autonomic nervous system. So, to some extent, the functions of the Vyana Vayu can be correlated with the autonomic nervous system. Thus, it's concluded that this article shows how Ayurveda has descriptive explanations related to the diseases of hypertension. Knowledge and concepts of Vyana Vayu Vikriti show a direct relationship of Vyana Vayu with blood pressure. And Vyana Vayu also shows a direct relationship with the factors affecting blood pressure due to which the condition of hypertension develops. Though our classical texts do not explain hypertension in clear terms, to maintain homeostasis, it is important to maintain Rasa Rakta Vikshepana in a normal state. Regular practice of Yoga, Meditation, Pranayama, and Nidan Parivara-jan, as well as proper dietary habits, is the best way to control blood pressure. These practices facilitate blood circulation, enhance local blood flow to the tissue, and help to maintain homeostasis.

## ACKNOWLEDGEMENT:

I would like to express my deepest gratitude to my guide, respected Dr. Babita Sharma mam. (Associate Professor, PG Dept. of Kriya Sharir, Pt. Khushilal Sharma Govt. Ayurveda Institute, Bhopal (MP), and sincere thanks to my dear friends, my respected senior and family members.

## REFERENCES

- 1 Ayurveda Dipika commentary of Chakrapani Datta. Reprinted. Varanasi, Chaukambha orientalia, 2011; 704.
- 2 Shivam Vaidh and Megha Bahuguna, Effect of Vitiated Vyaan Vayu in Hypertension, ejpmr, 2022,9(7), 275-283.
- 3 Kasper D, Fauci A, Hauser S, Jameson J, Longo D, editors Harrison's Principles of Internal Medicine, 19th ed: The Mc Graw-Hill, 2015; 1611.
- 4 Singh Shikha, Shankar Ravi, Singh G.P. Prevalence and Associated Risk Factors of Hypertension: A Cross-Sectional Study in Urban Varanasi, 2017; 2017: 5491838. doi:
- 5 Gupta R. Trends in hypertension epidemiology in India. J Hum Hypertension 2004; 18:73-8.
- 6 Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. Lancet 2005; 365: 217- 223 [ PubMed] [ Google Scholar].
- 7 Noncommunicable diseases country profile 2011. [http://www.who.int/nmh/countries/ind\\_en.pdf](http://www.who.int/nmh/countries/ind_en.pdf) [ Accessed 10 May 2013] [ Google Scholar].
- 8 Gupta R, Gaur K, Ram CVS, Emerging trends in hypertension epidemiology in India. Journal of Human hypertension. 2018;33(8):575-587.
- 9 Das SK, Sanyal K, Basu A. Study of urban community survey in Indi: growing trend of high prevalence of hypertension in a developing country. Int J Med Sci 2005; 2: 70-78 [ PMC free article] [ PubMed] [ Google Scholar].
- 10 Dr. Jyoti Gangwal and Dr. Sanjay Kholiya , an ayurvedic review of hypertension. World Journal of Pharmaceutical Research Volume 7, Issue 13, 1162-1170.
- 11 Ramesh Bhayal et.al, Role of Virechana Karma and Shaman Chikitsa in the management of Uccharak-tachapa (EHT), MD thesis, GAU, Jamnagar, 2003
- 12 Vriddha Vagbhata, Ashtanga Samgraha (Shashilekha commentary of Indu), edited by Shivaprasad Sharma, 2nd ed, Chaukhamba Sanskrit series office, Varanasi, 2008, Sutrasthana 20/6: 156 Vriddha Vagbhata, Ash-tanga Samgraha (Shashilekha commentary of Indu), edited by Shivaprasad Sharma, 2nd ed, Chaukhamba Sanskrit series office, Varanasi, 2008, Sutrasthana 20/6: 156
- 13 Ibid 16
- 14 Sharangadhara, Sharangadhara Sam- hita, edited by Shailaja Shrivastava, Reprint edition, Chaukhamba Orientalia, Varanasi, 2009, Poorvakhanda 6/8, 52.
- 15 Swami Sadashiva Tirtha, The Ayurveda Encyclopedia, edited by RC Uniyal, 5<sup>th</sup> edition, Ayurveda holistic center press, USA, 2005, pg.360.
- 16 Dr. Khatotra Sukhdev and Dr. Singh Bhopinder Hypertension- An Ayurvedic Perspective: A Review Wjpls, 2017, Vol. 3, Issue 9, 214-217.
- 17 Charaka Samhita (Ayurveda Dipika commentary by Chakrapani dutta). Jadavji Trikamji, editor. 1st ed. Varanasi: Choukhambha Surbharati Prakashan; 2005. Sutrasthana, 24/14-15. p. 124.
- 18 Charaka Samhita (Ayurveda Dipika commentary by Chakrapani dutta). Jadavji Trikamji, editor. 1 st ed. Varanasi: Choukhambha Surbharati Prakashan; 2005. Sutrasthana, 24/25-27. p. 125.

- 19 Zicha J, Kunes J, Devynck MA. Abnormalities of membrane function and lipid metabolism in hypertension: A review. *Am J Hypertens*, 1999; 12(3): 315–331.
- 20 Psychogenic Factors in Essential Hypertension: Methodology a Psychosomatic Medicine.
- 21 Paras Jain, Salil Jain, "Trupti Jain, Shuchi Dubey, Tejalrani Jaiswal, "Trusha lunagariya , Role of agni in the management of hypertension-a review study, ISSN: 2320-5091.
- 22 Viadya Yadunandan Upadhyaya editor Ashtanghri-dyam Sootrsthana ch.13/25, 8th ed. page 111 Chaukhamba Pra- kashan, Varanasi.
- 23 Ibid. 14, Nidanasthana, 15/10: 414.
- 24 Ibid. 7, Chiitsasthana, 28/36: 617.
- 25 Ibid. 14, Sutrasthana, 19/6: 149.
- 26 Ibid. 7, Chiitsasthana, 28/61, 206, 223: 619, 625, 626.
- 27 Anil D. Avhad, Vyas HA , Dwivedi RR Understanding Essential Hypertension through Ayurveda – A Review , IJPBA, Jul - Aug 2013, Vol. 4, Issue, 4.
- 28 Gracy Sokiya, Dr. Abhishek Bhushan Sharma and Gaurav Sharma, An Ayurvedic Exploratory Study of Vyana Vaishmya in Hypertension Volume 10, Issue 10, 72-89.
- 29 Agnivesha, Charaka Samhita, edited by Trikamji J, Commentary Ayurveda Dipika of Chakrapanidatta. 1st ed. Varanasi, Chaukhamba Orientalia; 2005 Sutra Sthana 12/8.
- 30 Tripathi B., Charaka Samhita, Varanasi, Chaukhamba Surabharti Prakashan, 1999, Chikitsa Sthaana 15/36.
- 31 Vagbhata, Ashtanga Hridaya, commentary by Prof. Gaur B.L. (2007), Varanasi, Chaukhamba Orientalia, Nidana Sthana 16/23.
- 32 Agnivesha, Charaka Samhita translated by Sharma R.K. and Das Bhagavan, Varanasi, Chowkhamba sanskrit series Chikitsa sthaana 15/8.
- 33 Vd. Snehal Sambhaji Patil, Dr. S. G. Kulkarni, Dr. S. S. Waghmare, A Criticle Study on Hypertension: Review from Brihatrayi, Volume 11, Issue 11, 1672-1679.
- 34 Trikamji J, Ram N, editors. Commentary Nibandha Sangraha of Dalhana on Sushruta Samhita of Sushruta, Sharira Sthana; Dhamaneevyakaranam Shareeram Adhyaya. 1st ed. Varanasi: Chaukhamba Sanskrit Sansthan; 2012. p. 386. Ch. 8, Verse 12.
- 35 Prof. Dr. Subhash Ranade , Prof. Dr. R.R. Deshpande, Prof. Dr. Swati Chobhe Chaukhamba Sanskrit Pratishthan dehi, A textbook of Kriya Sharira part-2.
- 36 Pungaliya R., S. Kalyani S., M. Chabanur S. Hypertension - An Ayurvedic approach 2023 volume 8.
- 37 Vaidya Yadavaji Trikamji Acharya, Agnivesha. Charaka Samhita. Varanasi: Chaukhamba Prakashan; Chapter 15, Chikitsa Sthana, shloka, 2013; 36.
- 38 Dr. K S Girhepunje, Dr. Varsha Gupta, Prof. O P Singh, An Ayurvedic Aspect of Atherosclerosis: A Lifestyle Disorder, (Ijrmst) 2018, Vol. No. 6, Jul-Dec.
- 39 Freel EM, Connell JMC. Mechanisms of hypertension: the expanding role of aldosterone. *JASN*, 2004; 15(8):1993-2001.  
<https://doi.org/10.1097/01.ASN.0000132473.50966.14>
- 40 Cecelja M, Chowienczyk P. Role of arterial stiffness in cardiovascular disease. *JRSM Cardiovasc Dis.*, 2012; 1(4). <https://doi.org/10.1258/cvd.2012.012016>.
- 41 Ha SK. Dietary salt intake and hypertension. *Electrolytes Blood Press* 2014; 12(1): 7-18.  
<https://doi.org/10.5049/EBP.2014.12.1.7>.
- 42 Moharana P., Roushan R., Effect of Prana and Vyana Vayu in Ncds WSR on Cardiovascular System. Doi: 5.5.2018. <http://www.researchgate.net/publication/329736996>.

**Source of Support: Nil**

**Conflict of Interest: None Declared**

How to cite this URL: Rainu Chauhan & Babita Sharma: The role of vyana vayu as an influencing factor in the development of hypertension w.s.r. to ayurvedic perspective. *International Ayurvedic Medical Journal* {online} 2024 {cited August 2024} Available from: [http://www.iamj.in/posts/images/upload/1425\\_1435.pdf](http://www.iamj.in/posts/images/upload/1425_1435.pdf)