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# A critical review on Hypertension - An Ayurvedic perspective

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## ABSTRACT

Hypertension is a major risk factor for cardiovascular diseases, stroke and kidney diseases leading to high mortality. Different theories have been proposed to explain Hypertension in an Ayurvedic perspective. A better understanding of the applied physiology and etio-pathogenesis of Hypertension in the light of Ayurvedic principles is been attempted to fill this gap. The various pathological mechanisms contributing the manifestation are compiled by going through text journals and internet search. It is found that the Hypertension is a disorder of Vata Dosha due to Avarana and can be considered as Vata Pradhana Tridoshaja Vyadhi. The various factors involved in the manifestation of Hypertension are Rasavaha, Raktavaha, Medovaha and Manovaha Srotas. Hence this study is made with an aim to understand the pathogenesis of Hypertension in terms of Ayurveda.

**Key words:** Hypertension, Tridosha, Srotas.

## INTRODUCTION

Hypertension is one of the most common lifestyle diseases today. Every third person is suffering from it. About 90% patients there is no known cause and this is very important to be alert. Hypertension itself is a very dangerous condition. It can cause drastic damage to the liver, brain, kidneys and the heart. The damaging of these vital organs is the most important cause of the death.<sup>[1]</sup> Hypertension is an important worldwide public health challenge and it is a major cause for the morbidity and mortality.<sup>[2]</sup> In India Hypertension is responsible for the 57% of stroke deaths and also 24% of all coronary heart disease

deaths.<sup>[3]</sup> In the present times, life has been made easy step of the way, but Human Being has also paid for it by becoming prey to many lifestyle diseases. These factors affect once mind and homeostasis of the body by several psychosomatic mechanisms and lead to many lifestyle diseases such as diabetes and Hypertension. As per World Health Organization report, about 40% of people aged more than 25 years had Hypertension in 2008.<sup>[4]</sup> In an analysis of worldwide data for the global burden of Hypertension, 20.6% of Indian men and 20.9% of Indian women were suffering from Hypertension in 2005. The rates for Hypertension are projected to go up to 22.9 and 23.6 for Indian men and women, respectively by 2025.<sup>[5]</sup> Hypertension is an instrumental disease and came into existence by the invention of sphygmomanometer in 1896 by Italian scientist Riva Rocci. After the moment the role of blood pressure has been studied in etiopathogenesis. Unfortunately there is no clinical or laboratory tests which can provide a quick positive diagnosis of Hypertension. To formulate Ayurvedic therapy it is of utmost important to understand the disease Hypertension as per the principles of Ayurveda. The direct description of Hypertension in Ayurvedic

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classics is not available, but this can be understood by proper assessment of *Dosha*.<sup>[6]</sup>

### AIMS AND OBJECTIVES

To understand the etio-pathogenesis of Hypertension in terms of *Ayurveda*.

### MATERIALS AND METHODS

The study of various *Ayurvedic* texts were made critically and an effort is made to understand the pathogenesis of Hypertension in terms of *Ayurvedic* principles. This study is carried out by literature search and critical review of the obtained facts by searching various medical research databases like pubmed, Google scholar, Embase and other national research databases.

### OBSERVATIONS AND DISCUSSION

As such the direct description of Hypertension is not available in *Ayurvedic* classics but there is a trend to describe this disorder by literally translating the term by making some suffix or prefix to the term *Rakta*. Many scholars have used the terminologies which are the literal translation of Hypertension in Sanskrit or Hindi. In translation they have used *Rakta* as a common prefix and different suffix as to denote the pressure like *Bhara*, *Daba*, *Rakta Chapa*, *Rakta Sampida* etc. Some have been mentioned the name of “*Vyana Vayu*” in the nomenclature e.g. *Vyana Bala Vriddhi*, *Vyana Prakopa* etc. Some scholars accepted *Rakta* as main *Dushya* in the pathogenesis of Hypertension and on the same basis given the names like *Raktagata Vata*, *Raktashrita Vata* etc. Some scholars have been used the terminologies based on *Avarana* of *Vata* e.g. *Raktavrita Vyana*, *Shleshmavrita Vyana* and *Vyana-Udanavrita Vata*. Some nomenclatures indicate the involvement of *Sira* and *Dhamani* in the Pathogenesis of Hypertension e.g. *Siragata Vata*, *Dhamanigata Vata*, *Dhamani Pratichaya* etc. The process of nourishment of various *Dhatu* (body tissue) and excretion of metabolic waste product of *Dhatu* are going on continuously within human body. This mechanism is carried out by the Cardiovascular System the main organ of this system

is *Hrudaya* (the heart).<sup>[7]</sup> the functions of heart are readily affected by the signals from nervous system and also by the psychological state of the individual. It is for this reason the *Hrudaya* is said to be the seat of *Mana* (the mind) and *Chetana* (life) in *Ayurveda*.

The circulation of *Rasa Rakta* is achieved and regulated by various mechanisms. The *Rasa Rakta* is circulated through the *Sira* (veins), *Dhamani* (arteries). For proper circulation certain amount of pressure is needed. This pressure is generated by the pumping action of *Hrudaya*, the state of wall of the *Sira*, size of lumen and volume of blood.<sup>[8]</sup> To ensure proper supply of nutrients and excretion of waste as per requirements during variations in external and internal environments, the pressure within the *Sira* and *Dhamani* needs to be changed accordingly. This dynamic change of pressure is regulated by the complex interaction of *Tridosha* as all the functions of the body are regulated by *Tridosha*.<sup>[9]</sup> The various *Dosha* involved in this regulation process are *Prana Vata*, *Vyana Vata*, *Apana Vata*, *Samana Vata*, *Sadhaka Pitta*, *Pachaka Pitta*, *Avalambaka Kapha*. According to Maharshi Charaka, it is not essential to give a specific name to every disease. In those conditions the physicians should treat the patient by considering the nature of disease, its sites, etiology and *Dosha-Dushya Sammurchhana*.

### VATA DOSHA

#### Prana Vayu

*Hridaya Dhruka* means the *Dharana* of heart is the typical function of *Prana Vayu*. It can be correlated with the vagal inhibition of nervous system.<sup>[10]</sup> Vasomotor center controls the blood pressure by autonomic nervous system. In the same way *Prana Vayu* also controls the blood pressure by controlling of *Vyana Vayu*. So the pathology of *Prana Vayu* can be a cause of abnormality of heart as well as vessels by developing hypertension.

#### Udana Vayu

Situated in *Urasthana* perform functions like *Prayatna* (volition/will), *Utsah* (Efforts), *Urja* (Energy), *Bala* (Strength), *Varna* (Complexion), *Poshana*.<sup>[10]</sup> All these

*Karmas* are performed in whole body. All the organs, directly or indirectly do their function (Efforts) with the help of Energy and Strength provided by *Udanavayu*. Heart beats approximately one lakh times per day, continuous without taking rest, for this effort heart needs extra strength and energy which is provided by *Udanavayu*.

#### **Vyana Vayu**

Situated in *Hridaya* performs the function like *Gati* (movements), *Prasarna* (extension), *Akunchana* (flexion), *Unmesha-nimesha* (blinking)<sup>[11]</sup> Circulation of heart caused by contraction of musculature of organ due to stimulation of *Vyanavata*. Affecting outflow of blood depends not only on effective ejecting capacity of heart but also calibre of blood vessels.

#### **Samana Vayu**

After the digestive process *Samana Vayu* helps in the transport of *Rasa* into the heart from the digestive organs. Apart from the heart it circulates in the whole human body.<sup>[12]</sup> Thus it proves that the *Samana Vayu* has an important role in the blood circulation and blood pressure.

#### **Apana Vayu**

Situated in *Pakvadhana*, *Guda*, *Vrishana*, *Basti*, *Medhra*, *Nabhi*, *Uru*, *Vankshana* and *Shroni* Performs expulsion of *Mutra*, *Purisha*, *Shukra*, *Garbha*, *Artava*, Normal functions of all *Doshas* including all *Vayus* depend upon the normal direction of *Apana Vayu*. *Acharya Caraka* has quoted that if there is obstruction in the path of *Apana vayu* i.e. in *Gudasthan* then the reverse direction of *Apana Vayu* vitiates *Samana Vayu*, *Vyana Vayu*, *Prana Vayu*, *Udana Vayu* and *Pitta-Shleshma*. Thus it can be said that all the normal functions of body are dependent upon the normalcy of *Apana Vayu*. Thus indirectly the circulatory functions remain under the control of *Apana Vayu*. *Mutra* and *Purisha* have been considered as *Mala*, which are able to produce diseases if not excreted at their regular intervals.<sup>[13]</sup> It is clear that there is some effect of excretion of *Mutra* on regulation of the body fluid. Vitiating of *Apanavayu* hampers the excretion of the *Mutra*, so the body fluid level becomes imbalance,

which may affect the maintenance of normal blood pressure. Similarly in modern science,  $\text{Na}^+$ ,  $\text{K}^+$ , urea, uric acid like waste substances are constituents of the urine, which have to be excreted at regular intervals. Retention of these substances cause toxic effects on the body and also alters the fluid balance. So, these are affecting homeostasis of human body which may affect blood pressure.

#### **Sadhaka Pitta**

Situated in *Hridaya* responsible for *Buddhi*, *Medha*, *Utsaha*, *Abhiman*, *Shaurya*, *Bhaya*, *Krodha*, *Harsha*, *Moha*.<sup>[14]</sup> *Sadhaka Pitta* helps to keep away *Raja* and *Tama*, which hampers *Chetana* to do its normal functions and makes *Mana* free from such *Avarana* of *Raja* and *Tama*. So, *Mana* becomes more efficient, in turn, enhances *Buddhi*, *Medha*, *Abhimana* etc. eventually helps "Atma" to achieve its goal. Psychological disturbances hamper the normal function of *Sadhaka Pitta* affect the heart rate and cardiac output, which is result high blood pressure.

#### **Avalambaka Kapha**

*Avalambaka Kapha* residing in cardiovascular system ensures smooth transport of *Rasa-rakta* through blood vessel. When it vitiates, it causes sticking of lipids in cardiovascular system. This augments peripheral resistance and lead to manifestation of Hypertension. *Kapha* vitiating may influence the viscosity of blood. Due to increased viscosity Hypertension may setup.<sup>[15]</sup>

#### **Mana (Mind)**

There is a close interrelation between the body and mind (*Mana*). *Manasik Bhavas* like *Krodha* (anger), *Chinta* (worry), *Bhaya* (fear) etc. plays an important role in the pathogenesis, progression and prognosis of all disease. This fact is focus that the *Mana* plays an important role in hypertension. Modern medical science also considers that the involvement of psyche (*Mana*) can be causative factors for hypertension.

#### **Role of Rasa in the manifestation of hypertension**

*Hrudaya* and ten *Dhamani* are described as *Mula* of *Rasavaha Srota*. Cardiovascular system is the main system deranged in Hypertension. In *Hrudroga* (heart

diseases) also the main *Dhatu* affected is *Rasa*. These facts support the vitiation of *Rasa* and *Rasavaha Srotas* in Hypertension.

#### Role of *Rakta* in the manifestation of hypertension

As per *Acharya Sushruta* the *Mulasthan* (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>[16]</sup> The complications of hypertension are encephalopathy, transient ischemic attacks and strokes. These disorders are closely resembles to the disease *Mada*, *Murchha* and *Sanyasa* which are described in *Vidhisonitiya Adhyaya* of *Charaka Samhita*. The *Srotas* vitiates in these disorders are *Rasavaha*, *Raktavaha* and *Samgyaavaha Srotas*.<sup>[17]</sup> This supports affection of *Raktavaha Srotas* in association of *Rasa* and *Manaovaha Srotas* in hypertension.

#### Role of *Medovaha Srotas* in the manifestation of hypertension

Function of *Medovaha Srotas* is closely related to the lipid metabolism. Abnormal lipid metabolism such as hypercholesterolemia, decreased HDL, increased triglyceride, increased LDL bring about endothelial dysfunction, atherosclerosis leading to manifestation of hypertension.<sup>[18]</sup>

#### Role of *Manovaha Srotas* in the manifestation of hypertension

Peoples exposed to repeated psychogenic stress have more tendencies to develop hypertension. Stress activates the sympathetic nervous system directly and sympathetic over activity in turn interact with high sodium intake, rennin-angiotensin and insulin resistance to mediate the pathogenesis of hypertension.

#### *Nidana*

*Nidanas* can be classified as;

1. *Aharaja Nidana*
2. *Viharaja Nidana*
3. *Manasika Nidana*

#### *Aharaja Nidana*

- *Vata Prakopa* due to *Katu, Tikta, Kashaya Rasa Ati Sevana, Anashana, Rooksha, Shushka Aahara, Alpashana*.
- *Pitta Prakopa* due to *Ushna, Ati Snigdha, Drava Aahara, Amla, Lavana, Kshara, Katu Rasa Pradhana Aahara, Dhoomapana, Madhyapana*.
- *Kapha Prakopa* due to *Guru, Snigdha, Sheeta, Dadhi Atisevana*.

#### *Viharaja Nidanas*

- *Vata Prakopa* by *Ratrijagarana, Ativyavaya, Ativyayama, Shrama, Pralapa*.
- *Pitta Prakopa* by *Atapa Sevana, Ati Vayu Sevana, Ushna Pradesha*.
- *Kapha Prakopa* by *Divasvapna, Atinidra, Avyayama*.

#### *Manasika Nidanas*

- *Vata Prakopa* by *Chinta, Bhaya, Shoka*.
- *Pitta Prakopa* by *Krodha*.
- *Kapha Prakopa* by *Achinta, Tandra, Nidradhikyata*.

It is well known that the blood pressure varies directly with cardiac output and peripheral vascular resistance. Increased cardiac output is encountered in;

1. Increased plasma volume i.e. *Rasavruddhi*.
2. Increased volume of R.B.C.s i.e. *Raktavruddhi*.
3. Increased heart rate i.e. *Vyanaprakopa (Vatavruddhi)*.

Increased peripheral resistance is due to a) Spasm of arterioles i.e. *Vyanaprakopa (Vatavruddhi)*, b) Chronic inflammatory diseases of the blood vessels i.e. *Pittavruddhi*. c) Atherosclerosis leading to thickening of blood vessels, which is due to *Kapha Vruddhi*.<sup>[19]</sup>

#### *Purvarupa*

Hypertension is said to be *Vata Pradhana Tridoshaja Vyadhi* and *Purvarupa* of the *Vata Vyadhi* is said to be

*Avyakta*.<sup>[20]</sup> Most of the hypertensive patients are asymptomatic or present with subjective symptoms like headache, vertigo etc. Many patients are diagnosed at routine check-up or other health problem. So the premonitory symptoms of Hypertension are indistinct.

### Rupa

*Ayurveda* is the science which examines the signs and symptoms on the basis of *Panchagyanendriya Pariksha*. The blood pressure measuring mainly depends upon *Darshana*, *Sparshana* and *Shravana Pariksha*. Many patients come with specific clinical features.

- **Shirahshoola (Headache):** Acharya Sushruta has stated *Shoola* cannot occur without the vitiation of *Vata*.<sup>[21]</sup> Acharya Charaka has included *Shirahshoola* in 80 types of *Nanatmaja Shiroroga* mentioned that *Prakupita Vatadi Dosha* cause *Dusti* of *Rakta Dhatu*, localizing in *Shira*, produce *Shiroroga*, which includes *Shirahshoola* also. This way due to *Vata Dusti*, *Shirahshoola* may occur.
- **Nidranasha (Insomnia):** Vitiating *Vata* and *Pitta* and *Manasa Santapa* are responsible for *Nidranasha*. Acharya Caraka has mentioned it under *Nanatmaja Vikara* of *Vata Dosha*. *Laghuguna* of *Vayu* generally causes *Nidranasha*. Under the symptoms of *Vata-Pittavridhi*, Acharya Sushruta has mentioned both *Nidraalpata* and *Nidranasha*.
- **Bhrama (Giddiness):** Acharya Sushruta has mentioned *Bhrama* as a result of vitiating *Raja*, *Pitta* and *Vata*. The *Chala Guna* of *Vayu* becomes dominant due to inflated *Rajadosha*, makes patient to feel him like revolving.<sup>[22]</sup>
- **Tamodarshan (Black Out):** Acharya Caraka has described *Tamodarshan* in *Rakta Pradoshaja Vyadhi*; hence *Tamodarshan* occurs due to *Srotorodha* in *Rakta Vahinis* of *Shira*.<sup>[23]</sup>
- **Daurbalya (Weakness):** *Daurbalya* has also been described in *Shonitaja Vyadhi*. Impairment of *Dhatu* formation due to *Rasa-Rakta Dusti* by

vitiating *Vata Dosha* also affects the formation of *Oja (Prakrita Bala)*, which produces *Ati Daurbalya*.

- **Hridayadravata (Palpitation):** Acharya Gangadhara has clearly mentioned that *Hridayadravata* means increased *Gati* of *Hridaya*. Moreover, while describing the symptoms of *Rasakshaya*, Acharya Charaka has mentioned "*Hridayam Tamyati*".<sup>[24]</sup> Gangadhara has commented on "*Tamyati*". Here, *Vyana Vayu* is aggravated with its *Chala Guna* resulting in *Hridayadravata*.
- **Krodha Prachurata (Excessive anger):** After the union of *Prakriti* and *Purusha*, *Mahat* entity comes in to the existence. *Mahat* means *Buddhi* (Intellect) which has the power to think, to understand and also to analyze the things. This *Mahat* considered as part taking of three fundamental attributes (*Satva*, *Raja* and *Tama*) of latent or original nature. *Ahamkara* or egoism in *Sanid Bhutadi* (Illusive or *Tamasika*) *Ahankara* come in to existence, it means the (thought of uniqueness of self existence) or attachment to wrong image of oneself (Ego). This *Ahankara* entity is the main cause of *Krodha*. *Vaikarika (Satvik) Ahankara* is the *Karma* of *Sadhaka Pitta* and *Krodha* is form of *Vikrut Sadhak Pitta*. Acharya Caraka has emphasized *Krodha* (Anger) as *Dharaniya Vega*. At many places, Acharya Caraka listed *Krodha* as *Hetu* in general and also a symptom in diseased conditions, but in it is listed as *Raktapradoshaja Vikara*.
- **Klama:** The tiredness of body and mind without doing any physical and mental exertion is called as *Klama*. *Klama* is common symptom in the maximum number of EHT patients. Acharya Caraka listed the symptom under *Raktapradoshaja Vikaras*. *Vatadoshaprakopa* results in the vitiation of *Rasa* and *Raktadhatus* which causes *Klama*.

### Samprapti of Hypertension in Ayurveda

*Ati Lavana Sevana* (Excessive salt intake), *Madyapana* (Alcohol consumption), *Snigdha Bhojana* (oily diet), *Divaswapna* (day time sleep) and *Manovighata* (Mental accident) leads to vitiation of *Shonita* (blood). But *Shonita* being *Dhatu* (tissue) is not capable of

vitiating *Doshas* (pre mordial factors of body) independently. The *Doshas* present in the *Shonita* which are involved indirectly in the manifestation of high blood pressure. The over use of salt, alcohol vitiates the *Sadhaka Pitta* and *Shonita* (blood). Sedentary habits vitiates the *Avalambaka Kapha* and psychological stress induces vitiating of *Prana Vayu*. Initially *Prana Vayu* gets *Prakopa*. Since *Prana Vayu* has influence on *Hridaya* (heart), vitiates *Hridaya* and its residing components like *Vyana Vayu*, *Sadhaka Pitta*, *Avalambaka Kapha*. *Shonita* is also involved as it is located in *Hridaya*. *Prakupita* (vitiating) *Avalambaka Kapha* induces exaggerated contractility of the heart, while aggravated *Vyana Vayu* leads increased *Gati* (speed), the force of ejection of blood from *Hridaya*. These events result into forceful expulsion of blood through *Dhamanis* (blood vessels), ultimately leading into increased resistance in vessels ensuing High blood pressure.

### Samprapti Ghataka of Hypertension

From the above references it is clear that the pathological factors involved (*Samprapti Ghataka*) in manifestation of hypertension are as follows;

#### Dosha

**Vata** : *Vyana, Udana, Prana, Apana, Samana*

**Pitta** : *Pachaka, Sadhaka*

**Kapha** : *Avalambaka, Tarpaka*

**Manasa** : *Raja, Tama*

**Dusya** : *Rasa, Rakta, Meda*

**Srtoas** : *Rasavaha Srotas, Raktavaha Srotas, Samjnavaha Srotas*

**Srotodusti** : *Sanga, Sira Granthi*

**Agni** : *Jatharagni, Dhatvagni*

**Ama** : *Jatharagni, Dhatwagni-Mandya-Janya*

**Udbhav** : *Ama-Pakwashaya*

**Sanchara** : *Rasayani* (Dhamanis)

**Adhithana** : *Manodaihika* (Psychosomatic) *Hridaya, Sira, Dhamani, Srotas, Basti*.

**Rogamarga** : *Madhyama* (*Marmaasthisandhi*)

### CONCLUSION

The disease hypertension is not a single disease entity rather it is a common presentation of wide spectrum of pathological process. To devise treatment of Hypertension as per *Ayurveda* the various pathological components (*Samprapti*) like *Dosha, Dushya Srotas* etc. should be examined properly. These pathogenetic factors should be addressed properly with special consideration of strength of disease and diseased while treating Hypertension. Thus Hypertension can be understood as a psychosomatic haemodynamic condition where *Vata Pradhana Tridoshas* and *Mana* are vitiating and affecting the *Rasa Rakta Dhatus* as *Dushyas* with both entire body and mind.

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