



## HYPERTENSION- AN AYURVEDIC PERSPECTIVE: A REVIEW

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### ABSTRACT

Hypertension is a major risk factor for cardiovascular diseases, stroke and kidney diseases leading to high mortality. Conventional treatment modalities do not have enough efficacies in reducing target organ damage and they have adverse effects as well. So it is the need of time to get safe, effective and cost-effective remedies in Ayurveda. Formulating Ayurvedic therapy for hypertension warrants proper understanding of hypertension as per the principles of Ayurveda. This study is made with an aim to understanding the pathogenesis of hypertension in terms of Ayurveda. The various pathological mechanisms contributing the manifestation are compiled by going through texts, journals and internet search. The obtained data are reviewed critically to understand in terms of Ayurveda. It is found that the hypertension is a disorder of Vaata Dosha due to Aavarana. The causative factors are Santarpanajanya Nidaana (etiological factors leading to overproduction of tissues). The various other factors involved in the manifestation of Hypertension are Rasavaha, Raktavaha, Medovaha and Manovaha Srotas. The treatment of Hypertension should be done with targeting these factors with proper assessment of strength of disease and diseased.

**KEYWORDS:** Hypertension, Pathogenesis, Rasa-Raktavaha Srotas, Tridosha.

### INTRODUCTION

Hypertension refers to increase in arterial pressure above the normal limit of blood pressure. Blood pressure is the pressure exerted by blood column per unit area of arterial wall during pumping of heart. The line of demarcation between normal and raised blood pressure is obscure and depends on individual circumstances. However, most doctors agree that the ideal blood pressure for a physically healthy person is around 120/80 mmHg.<sup>[1]</sup> Hypertension is a major risk factor for cardiovascular diseases, stroke and kidney diseases. About 2.3 million deaths in India was attributed to cardiovascular diseases in the year 1990 and is projected to double by the year 2020.<sup>[2]</sup> Hypertension is directly accounted for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. Epidemiological studies show that hypertension is present in 25% urban and 10% rural subjects in India. At an underestimate, there are 31.5 million hypertensive in rural and 34 million in urban populations. Modern treatment modalities although reduce the blood pressure in short term their long term efficacy i.e. target organ damage reduction is not enough. The conventional antihypertensive drugs have many adverse effects and are not well tolerated which lead to non-compliance, switching and discontinuation of treatment<sup>[3]</sup> which have an important impact on the costs

of antihypertensive therapy as well as complication mortality due to hypertension. So it is a need of the time to get safe effective and cost-effective remedies for hypertension in Ayurveda. To formulate Ayurvedic therapy it is of utmost importance to understand the disease hypertension as per the principles of Ayurveda. The direct description hypertension in Ayurvedic classics is not available. But this can be treated by understanding its pathogenesis by proper assessment of predominant Dosha (morbid factor), site of organs affected, causes<sup>[4]</sup> leading to manifestation of hypertension.

### AIMS AND OBJECTIVE

To understand the pathogenesis of hypertension in terms of Ayurvedic Samprapti (pathogenesis).

### MATERIALS AND METHODS

This study is carried out by literature search and critical review of the obtained facts. The pathogenesis of hypertension is obtained by searching various medical research databases like pubmed, Google scholar, Embase and other national research databases. The terms entered for search are "hypertension", "essential hypertension", "hypertension pathogenesis", and "hypertension physiology", "physiology of blood circulation. Manual search was made by going through the reference list of

retrieved articles to identify relevant additional study. 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.

## OBSERVATIONS AND DISCUSSION

As such the direct description of hypertension is not available in Ayurvedic classical text 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, Chapa, 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, Rakta Vata, and Raktashrita Vyadhi 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 Praticaya etc.<sup>[5]</sup> 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 Rasaraktsambahana (Cardiovascular System). The main organ of this system is Hrudaya (the heart).<sup>[6]</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>[7]</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 change 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>[8]</sup> The various Dosha involved in this regulation process are Prana Vata, Vyana Vata, Apana Vata, Samana Vata, Sadhaka Pitta, Pachaka Pitta, Avalambaka Kapha.<sup>[9,10]</sup>

### Role of Vata in the manifestation of hypertension

The interaction of Prana and Vyana Vayu is responsible for the force generated during cardiac output, which is mediated by the sympathetic outflow of the nervous system. Sympathetic nervous over activity causes increased fluid volume, venous constriction which

increases the preload.<sup>[11]</sup> This causes increased contractility of the Hrudaya as well. Increased preload and increased contractility of heart influences the cardiac output. Functional constriction of arteriole also results from sympathetic nervous system activity leading to increased peripheral resistance. Apana Vayu helps in excretion function of human body. Its main site is Vasti (kidney). The blood pressure is maintained within normal limit by the regulation of excretion of Na<sup>+</sup> and water through urine.<sup>[12]</sup> It is for this reason the function of Mutra is said to be “Kledavahanam” (removing extra fluid from body). Various study show that in hypertension there is disturbance in excretion of Na<sup>+</sup> in response to Na<sup>+</sup> overload and pressure rise.<sup>[13]</sup> Samana Vayu helps in Ahara Pachana. Ahara Pachana in Ayurveda is a broad term. It includes the process of digestion, absorption as well as assimilation of food to various tissues. Due to abnormality of this Vayu proper transformation of food to Dhatu hampered so that excessive transformation to Apakwa Meda Dhatu (harmful lipids) occurs. This manifests as dyslipidemia and increased free fatty acid in blood. They cause endothelial dysfunction and get deposited in blood vessel leading to manifestation of hypertension.<sup>[14]</sup>

### Role of Pitta in the manifestation of hypertension

Pitta is responsible for the metabolic transformation of various Dhatu. Aberrant Pitta function leads to excessive production of bad cholesterol which causes insulin resistance and hyperinsulinemia. Hyperinsulinemia is responsible for increased blood pressure by various pathological processes.<sup>[15]</sup> Sadhak Pitta is responsible for the strength of contraction of myocardium. Abnormality of this Pitta causes increases cardiac contractility leading to increased cardiac output. The property of Pitta is to induce liquidity and spreading properties (Drava and Sara) to body elements. Increased blood volume in the pathogenesis of hypertension<sup>[16]</sup> may be inferred as abnormality of Pitta Dosha.

### Role of Kapha in the manifestation of hypertension

Avalambaka Kapha residing in cardiovascular system ensures smooth transport of Rasa-rakta through blood vessel. When it vitiate, it causes sticking of lipids in cardiovascular system. This augments peripheral resistance and lead to manifestation of hypertension. Kapha vitiation may influence the viscosity of blood. Due to increased viscosity hypertension may set up.<sup>[17]</sup>

### 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 Srota in hypertension.

### Role of Rakta in the manifestation of hypertension

As per Acharya Sushruta the Mulasthan (origin) of Rasavaha Srota is Rakta Vahini Dhamani (Vascular

System). The symptomatology of Raktavaha Srotodushti as per Acharya Charaka closely relates to the symptoms of hypertension.<sup>[18]</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 vitiate in these disorders are Rasavaha, Raktavaha and Samgyavaha Srotas.<sup>[19]</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>[20]</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.<sup>[21]</sup>

#### Samprapti Ghataka of Hypertension

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

#### Nidana

**Aharaja** : Atisantarapaka, Atimatrasana, Virruddhasana, Adhyasana, Madyapana

**Viharaja** : Divaswapa, Avyayama, Vagadharana, Ratrijagaran

**Manaska** : Chinta, Krodha, Soka, Irsya, Bhaya, Avasada

#### Dosha

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

**Pitta** : Pachaka, Sadhaka

**Kapha** : Kledaka, Avalambaka, Tarpaka

**Manasa** : Raja Tama

**Dusya** : Rasa, Rakta, Meda

**Srotas** : Rasavaha Srota, RaktavahaSrota, Samjnavaha Srota

**Udbhav** : Amasaya Samuttha

**Sanchara** : Sarvasarira

**Adhithana** : Dhamani, Sira, Hridaya, Sira, Basti

**Rogamarga** : Madhyama (Marmaasthisandhi)

**Srotodusti** : Sanga

**Agni Mandya** : Ama Jathar Agni Mandya Janita

**Ama** : Rasa-Rakta Dhatvagni Janita

#### CONCLUSION

The disease hypertension is not a single disease entity rather it is a common presentation of wide spectrum of pathological process. To device 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.

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