

**THE ROLE OF DIET IN THE PREVENTION AND MANAGEMENT OF  
HYPERTENSION- A CRITICAL REVIEW****Dr. Nidhi<sup>1\*</sup>, Dr. Rajnikant Rohilla<sup>2</sup> and Dr. Harsha Mohan Singh<sup>3</sup>**<sup>1</sup>PG Scholar, Department of Kayachikitsa, Quadra Institute of Ayurveda, Roorkee, Uttarakhand, India.<sup>2</sup>Professor and H.O.D., Department of Kayachikitsa, Quadra Institute of Ayurveda, Roorkee, Uttarakhand, India.<sup>3</sup>Assistant Professor, Department of Kayachikitsa, Quadra Institute of Ayurveda, Roorkee, Uttarakhand, India.**\*Corresponding Author: Dr. Nidhi**

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**ABSTRACT**

Ayurveda, an ancient science of life, emphasizes the balance of Dosha, Dhatu, Mala, and Agni for maintaining health, focusing on physical, mental, emotional, and spiritual well-being. The three fundamental pillars of Ayurveda are Ahara (Diet), Nidra (Sleep), and Brahmacharya (Conduct), with Ahara playing a pivotal role in sustaining life. In today's fast-paced lifestyle, improper dietary habits have become a significant contributor to many lifestyle disorders like hypertension (HTN), Diabetes Mellitus (DM), Obesity etc. Ayurveda provides a holistic approach, analysing the imbalance of Doshas, affected channels, and causative factors in managing such diseases. Modern guidelines, such as the DASH diet, aim to control blood pressure by emphasizing balanced food intake and limiting salt, saturated fats, and alcohol. Ayurveda complements this with its focus on appropriate diet and lifestyle, advocating for the consumption of balanced meals, proper eating habits, and stress management through practices like pranayama. This article also highlights the importance of integrating dietary guidelines from both Ayurveda and modern nutritional science to effectively manage hypertension and promote long-term health.

**KEYWORDS:** Ayurveda, Hypertension, Diet.**INTRODUCTION**

Ayurveda is a well-known experienced science based upon many fundamentals. Various Disciple of Ayurveda have put focus on many Parameters in origin of various disorders. Ayurveda defines health as the balance of Dosha, Dhatu, Mala & Agni as well as the Physical, Mental, Emotional and spiritual well-being. Both living & Non-living things in this universe are composed of 5 basic elements, the *Panchmahabhuta*, namely Earth (Prithvi), Water (Ap), Fire (Teja), Air (vayu) & Ether (Akasha). The *Panchmahabhuta* components of ingested food nourishes their respective tissue elements in the body. Ayurveda the science of life mentions Aahar, Nidra and Brahmacharya as Upastambhas(sub pillars) of life.<sup>[1]</sup> Among these Ahara has been placed first which show it is important to maintain & Sustain life.

In Yogratnakar Jwar chikitsa Chapter it is mentioned that Nidana, Aushadi, Pathya should be considered properly before Treating Any disease.

“निदानौषधपथ्यानि त्रीणि यत्नेन चिन्तयेत्

तेनैव रोगाः शीर्यन्ते शुष्क नीर इवा अंकुरा”<sup>(2)</sup>

Ayurveda focuses on prevention and healing through the

key ideas of Pathya (healthy lifestyle), Ahara (food), and Vihara (Daily activities). It highlights simple dietary rules, like choosing the right food, combining foods properly, cooking methods, food storage, and maintaining cleanliness and good eating habits. Nowadays, with people leading busy lives, changes in eating habits and a lack of understanding about proper diet and nutrition are leading to many health problems. One such life style disorder is Hypertension. Hypertension is a chronic Medical Condition caused by persistently elevated Blood Pressure in the arteries.<sup>[3]</sup> It is Characterised as a persistent increase in systolic Blood Pressure of 140 mm Hg and Diastolic Blood Pressure of 90 mm Hg.<sup>[4]</sup>

Ayurveda does not categorically describe a single disease equivalent to hypertension. In Charak Sutra 18/44 it is stated that Vaidya should not be ashamed if he is not able to name a particular disease. Such disease should be treated according to the Prakriti, Adhisthana and Samuthana. According to Ayurvedic Principles, when faced with an unknown disease, Physician analyse its Nature through factors such as Dosha imbalance, Affected channels & causative factor before initiating Treatment. The dietary habits have undergone significant

changes over the past decades. Adequate intake of all the essential nutrients through a well- formulated balanced diet is needed to maintain Good Health. Our aim is to provide evidence based Recommendations to help people make informed food choices to maintain good Health.

Therefore we have tried to attempt to collect Basic guidelines for the disease Hypertension.

### AIMS

To educate readers about the role of diet in managing & preventing HTN and to analyse the Current dietary recommendations and their effectiveness in controlling BP.

### OBJECTIVES

1. To review different Dietary Guidelines .
2. Identify specific Nutrient and food group that influence Blood Pressure.

### MATERIAL AND METHODOLOGY

Comprehensive review of the literature on dietary guidelines such as DASH, other specific nutrients and food substances that influence Blood Pressure was conducted, with data compiled using a variety of search engines and publishing houses, including PubMed, Google Scholar, Frontiers, and NCBI. Other literature sources, such as Wikipedia, ethnobotanical publications, and various online domains, were also examined to obtain information. This paper includes the evidence-based overview of the dietary recommendations for maintaining blood pressure, which may be helpful to establish a standard and most effective diet plan for further research by Collecting information on the choosen topic conducted till date.

#### A) Concept and Importance of different dietary components affecting bp

A balanced diet provides all the nutrients your body needs. Since no single food contains all the essential nutrients, it's important to get them by wisely choosing a variety of different foods.

Estimates show that 56.4% of total disease burden in India is due to unhealthy diets. Healthy diets & physical activity can reduce a substantial proportion of Coronary Heart disease & Hypertension & prevent upto 30% of Type 2 diabetes.<sup>[5]</sup>

Food have been categorised into 10 groups to help people make choices from different food groups.

- 1) Cereals & Millets - Rice, Wheat, Millets and other cereals, etc.
- 2) Vegetables – Spinach, Bottle Gourd, etc.
- 3) Pulses – Lentil, Green gram, Chickpea, Rajma, Cowpea, etc.
- 4) Nuts, oils seed, oil and fats – Peanuts, Walnuts, Almonds, etc.
- 5) Fruits – Orange, Apple, etc.
- 6) Green leafy vegetables – Spinach, Lettuce, etc.
- 7) Dairy – Milk, Curd and butter milk

- 8) Roots & Tubers – Beetroot, Radish, Carrot, etc.
- 9) Flash food – Marine fish, poultry and lean cut meat
- 10) Spices & Herb – Turmeric, Ginger, etc.

Dietary guidelines play a pivotal role in guiding individuals towards selecting appropriate food in adequate quantities across a range of food groups, thereby facilitating optimal Nutrition throughout the lifetime.

### Fats & oils

There are three types of Fatty Acids in our diets, saturated fatty acids, Mono unsaturated fatty acids & Poly unsaturated fatty Acids. Intake of oils and fats should be in moderation. High intake of saturated fats enhance calorie intake and increase the risk of heart disease & Stroke.<sup>[6]</sup> Partially Hydrogenated fats (Vanaspati) should also be avoided as they contain trans fats and saturated fats.

**According to WHO** = Intake of Saturated fatty acids should be reduced to less than 10% of total energy consumption, and trans fatty acids to less than 1%.<sup>[7]</sup>

Trans fatty Acids can be reduced by Replacing them with Poly unsaturated fatty acids. Sources of Polyunsaturated fatty acid:-

Vegetable oils = Grape seed oil, Soyabean seed oil, Avocado oil, Olive oil Marine Sources = Oily fish lipids, Liver of Lean white fish

Nuts/Seeds = Hemp seeds, Chia seeds, Nuts, Pistachio, Almonds

### Salt

Existing evidence reveals a deleterious impact of high salt intake on blood vessels, blood pressure, bones and GIT. Prevalence of HTN is low in population consuming less than 3g Salt per day. Restriction of dietary salt decrease the risk of hypertension.

WHO recommends a reduction in sodium intake to less than 2 grams per day of sodium.<sup>[8]</sup>

### Potassium

According to WHO dietary intake of potassium lowers blood pressure & is protective against stroke & cardiac arrhythmias. Potassium intake should be at a level which will keep the ratio of sodium to potassium close to 1:1 i.e. at daily potassium intake of 70-80 mmol per day.<sup>[9]</sup>

### Alcohol

The mechanism through which Alcohol raises blood Pressure Remain elusive. Several Possible mechanisms have been proposed such an imbalance of the Central Nervous Systems, impairment of the baroreceptors, enhanced sympathetic activity, stimulation of the Renin-Angiotensin aldosterone System, increased cortisol levels, increased vascular reactivity due to Increase in intracellular. Calcium levels, stimulation of the endothelium leading to release Vasoconstrictors & loss

of Relaxation due to inflammation and oxidative injury of the endothelium leading to inhibition of endothelium dependent Nitric oxide production is the major contributors of the Alcohol induced HTN.

For those who drink Alcohol, consume of less than Or equal to 2 drinks/day and less than Or equal to 1 drink/day in women Should be done to prevent alcohol induced HTN.<sup>[10]</sup>

#### **DASH - diet plan to Control HTN**

DASH eating Plan target for a 2,000 calorie a day diet  
Food group Daily serving

Grains 6-8

Meats, Poultry, fish 6 or less

Vegetables 4-5

Fruit 4-5

Low fat or fat free dairy products 2-3

Fat & oils 2-3

Sodium 2,300 mg

Food group

Weekly serving Nuts, seeds, Dry beans and peas 4-5

Sweets 5 or less

#### **B) Review of ayurvedic literature regarding dietary Habits and Components for management of hypertension**

Ayurveda main aim " Swasthyasya Swastha Rakshanam Aturesye Vikara Prashman cha" can be achieved by Traya upastambha i.e. Aahar, Nidra & Bramcharaya. Type of Aahar & Aahar Matra that we consume in proper or in improper way and Dinacharya, Ritucharya & Sadvrit is responsible for the formation of body or cause of various lifestyle disorder like Hypertension.

In Ayurveda Aahar is considered as Mahabhaishajya. According to lolimbraj, when diet is wrong then medicine is of no use, when diet is correct then there is no need of medicine. According to Sushrut Samhita, "Sankshaptae kriya Yoga Nidan Parivarjanam" is treatment of disease.

Acharya Charak has described 2 type of Aahar i.e. Guru Aahar and Laghu Aahar. Laghu Aahar is predominant in properties of Vayu & Agni while guru Aahar is predominant in properties of Prithvi and soma. Laghu Aahar being stimulant of digestion, even taken up to the saturation point produce little derangement. On the contrary the Guru Aahar because of dissimilarity are not stimulant of digestion by nature & should not be taken upto the Saturation point.

Food should be consumed by dividing it into 3 portion for belly such as one portion of the space for solid food items, one for liquids and one for Vata, Pitta and Kapha.

While taking food in such quantity, one is not inflicted with any harmful effect caused by food taken in inappropriate quantity.

#### **Daily regimen of aahar**

To maintain the Health and prevent the disease, person should consume the following Aahar in their daily Routine.

Rakta shali Mudaga Saindhav Lavana Amlaka  
Dugdha Ghrita Madhu

Different Acharyas have given some dietary rules which need to be followed in daily life which not only prevents the onset of lifestyle diseases but also cures the severe complications that could further develop from the respective disease.

#### **Aahar vidhi vishesha ayatana<sup>[11]</sup> (What to eat?)**

These are the special rules in the science of diet and dietetics. Acharya Charak and Acharya Vaagbhat have given these factors which determine utility of various types of foods. The factors are mentioned -

- Prakriti: Inherent nature of food substances  
Eg: Masha is Guru in nature, Mudga is Laghu in nature.
- Vikriti: Processing results in transformation of inherent qualities of substances Transformation of food qualities by AgniSamskar like procedures.
- Samyoga: Combination of two or more food items  
Combination of Ghrita and Madhu.
- Rashi: Quantity of food substances to be taken

Quantity of all the food substances involved is Sarvagraha. Quantity of each of the food substance individually is Parigraha

- Desha: Habitat of food substance It determines various qualities of substances according to geographic region.
- Kala: Time as age, season, and conditions Time factor is very important for food intake. It should be decided according to daily and seasonal variations and also age and disease condition.
- Upayoga Samstha It consists of dietetic rules
- Upayokta Habitat and state of individual Person who takes food.

The consumption of Aahar following Aahar Vidhi Vishesha Ayatana, such as eating laghu samskarit anna with less amount of fat content and in proper quantity (avoid over eating) along with determining the seasonal variations like avoiding ushna veerya components in summer season, would definitely help in maintaining blood pressure.

The Aahar Vidhi Vishesha Ayatana factors should be combined and complimented with Aahar Vidhi Vidhan, mentioned by Acharya Charaka, for much better prevention and cure of lifestyle diseases.

**Aahar vidhi vidhan<sup>[12]</sup> are briefly described below**

Aahar Vidhi Vidhan	Description
<ul style="list-style-type: none"> <li>Ushanamashniyat, Snighdhamashniyat</li> </ul>	<ul style="list-style-type: none"> <li>Ushna and Snighdha Guna enhances the taste of food, increases Agni so food easily digested, pacifies Vata, enhances growth of the body, provides strength to Indriyas, also improves Varna of the body.</li> </ul>
<ul style="list-style-type: none"> <li>Matravataashniyat</li> </ul>	<ul style="list-style-type: none"> <li>Matra according to Ayurveda is of two types, Sarvagraha (Whole amount), Parigraha (Amount of individual ingredient). Quantity of diet should be according to Agni and Bala of body.</li> </ul>
<ul style="list-style-type: none"> <li>Jirneashniyat</li> </ul>	<ul style="list-style-type: none"> <li>Aacharya Charaka explains that 'Kaalbhojanam Aarogyakaranam'. Meal should be taken at proper time and only after digestion of previous meal otherwise in Srotas it accumulates Klinta inside it</li> </ul>
<ul style="list-style-type: none"> <li>Viryaviruddhamashniyat</li> </ul>	<ul style="list-style-type: none"> <li>Combination of two food substances having different Veeryas during eating leads to Rakta Vikaras, Grahani, Shotha, etc</li> </ul>
<ul style="list-style-type: none"> <li>Ishtedeshe Ishta Saropakarnam Cha Ashniyat</li> </ul>	<ul style="list-style-type: none"> <li>One should have meals in a pleasant place, with all prepartions. Pleasantness calm down mind and hence good digestion occurs</li> </ul>
<ul style="list-style-type: none"> <li>Naatidrutamashniyat, Naativilambitamashniyat, Ajalapanahasana Tanmanabhunjeet</li> </ul>	<ul style="list-style-type: none"> <li>One should not take meals in hurry. Food taken very slowly, very hurriedly, talking, laughing disturbs digestion. One may overeat or remains hungry.</li> </ul>
<ul style="list-style-type: none"> <li>Aatmanam Abhisamikshya Bhunjeet Samyaka</li> </ul>	<ul style="list-style-type: none"> <li>One should take diet according to Agni, Bala, Satmya, Prakruti</li> </ul>

Aacharya Sushruta has described “**Dwadasha Ashan Pravicharana<sup>[13]</sup>**” for people suffering from various types of diseased conditions. Some of them which can be helpful in managing hypertension are mentioned below-

- Sheeta Anna - Patients suffering with thirst, heat, alcoholism, burning sensation, Rakta Pitta, poisoning should be treated with Sheeta Anna. As per samprampti of hypertension it will help in vitiating Pitta dosha Pradhan symptoms.
- Ushna Anna - Patients suffering with Kapha and Vataprakopa symptoms during hypertensive condition as well as those who are already treated with Snehavirechan, and whose body is full of Kleda should be treated with Ushna Anna.
- Snigdha Anna -Patients suffering with Vataprakopa, having Rukshata in body, and those accustomed to physical exercise should be treated with Snighdha Anna
- Ruksha Anna -Those, with an excess Medas and Kapha as well as patients suffering from Meha, those who are previously treated with Sneha, should be treated with Ruksha Anna.
- Drava Anna - Weak, thirsty persons should be given to Drava Anna.
- Sushka Anna - Patients suffering from Meha, as well as those whose bodies are full of Kleda should be treated with Shushka Anna.
- Aushdhayukta Anna -Medicine should be given with food and drink to a person.

Some of the efficient medicines with proven effect on hypertension has been described below-

#### 1. Chedana dravyas

**Vibhitaki** - Rasa- Kashaya, Guna-Laghu, Ruksha, Virya-

Ushna and Chemical composition- Mannitol which acts as Diuretic. It helps in lowering cholesterol and even acts through calcium antagonist mechanism.

**Maricha** - Chemical composition- Piperine. It reduces the obesity and hyperlipidemia - by lowering the lipid absorption through inhibitory action on cholesteryl ester synthesis. It inhibits the action of phenylephrine (Which is a vasoconstrictor) and potassium efflux, thus reduces contraction of heart muscles.

**Guduchi** - Chemical composition- Diterpenoid lactones. Acts as vasorelaxant and Best Medohara.

#### 2. Rakta shodhaka dravyas

**Sariva** - Methanolic extract of roots acts as Antithrombotic by enhancing the release of lipoprotein lipase enzyme

**Manjistha** - Acts as diuretic, calcium channel blocker, antistress and Vasodilator

#### 3. Mutrala dravyas

**Gokshura** - Diuretic- reduces the intra vascular volume, thus preventing further accumulation of fluid

**Punarnava** - Alcoholic and aqueous extract - Diuretic. Total alcoholic extract - Cardiotonic. Virya -Ushna, so clears the obstruction.

**4. Medhya rasayana:** Due to their Medhya Guna, Tridosha Shamaka, Nidra Janan, Rasayana and Balya properties - reduce the Chala Guna of Vata.

**Bramhi**- It's cardiotonic, and reduce the anxiety, serum creatinine and Blood pressure.

**Sarpagandha** - Chemical composition- Reserpine. Reserpine controls Nerve impulse along the pathway that affect the heart and blood vessels thus it depletes the



catecholamines and serotonin causes vasodilation and reduces peripheral resistance.

**Shankhapushpi**<sup>[16]</sup>- Controls the production of stress hormone. Its ethanolic extract has been found to reduce cholesterol, triglycerides and phospholipids.

#### **Pathyapathya for management of hypertension**

**Pathya:** Lifestyle modification like timely intake of balanced diet, more use of fruits and green vegetables. Yava, Godhum, Mudga, Shigru, Kulatta, Karavellaka, Amalaki, Draksha, Carrot, Apple, Pineapple etc. Regular physical exercise, daily brisk walking for half an hour. Timely sleeping and awakening. Regular practice of Yoga, Meditation.

**Apathya:** Excessive intake of salt, intake of oily, salty, sour, spicy food items more use of butter, oily food, fried food, chillies, pickles, Dadhi, tea, coffee. alcohol, smoking, tobacco etc.

**Prevention:** Practice of Dinacharya, Ritucharya, regular physical activity, cessation of smoking, alcohol, tobacco chewing, dietary salt restriction, dietary modification, weight reduction.

#### **Other factors affecting blood pressure**

##### **Diurnal variation**

Over the last 2 decades, through the use of 24-hour ambulatory blood pressure monitoring, the importance of the diurnal blood pressure Pattern has been more clearly elucidated.

Normally during sleep, BP decreases ("dips") more than 10% from daytime Baseline Bp. Individuals who do not exhibit this >10% decrease have been referred to as nondippers. In Patient with Hypertension, non dipping has been shown to be associated with target organ damage and Cardiovascular events. In the general population, Non dipping may be a risk factor for cardiovascular disease mortality independent of the overall BP during a 24 hour period.

**Pranayama:-** Out of so many risk factors for essential hypertension, stress is one of the modifiable risk factors as recently reviewed by WHO scientific group.

Chronic Psychological stress and negative affective states contributes significantly to the Pathogenesis and progression of hypertension. These hypertensive Patients also display acute peaks in BP as per circadian Rhythm. These peaks are associated with work stress and psychobehavioral responses to stress such as anger, anxiety, tension & Nervousness.

The overactivity of Sympathetic Nervous system has an important part to play in the pathogenesis of HTN. Pranayama breathing has shown to alter autonomic activity as it increases parasympathetic Activity. If hypertensive Patients could adopt a Simple relaxation technique that would reduce stress and its physiological

effects, they may be able to control their BP better.

#### **DISCUSSION**

Improper life-style and food habits, psychological stress factors etc. with or without genetic predisposition provokes and vitiates all the three Doshas to trigger the pathogenesis of hypertension. Anya Dosha Avarana and Anyonya Avarana are the mechanisms of pathogenesis. With the help of recent advancements in the medical science the diagnosis of hypertension made possible at an early stage and thus effective management can be offered at this stage itself to avoid risk of damage to vital organs. Thus, hypertension can be understood as a psychosomatic hemodynamic condition where Vata Pradhana Tridoshas are vitiated affecting the Rasa-Rakta Dhatus as Dooshyas with both Sarva Shareera and Manas as its Adhithana and structural changes as complications of long-term hypertension on various organs like heart, blood vessels, kidney etc. Hence in order to manage this diseased condition both modern and ayurvedic approach have significant inclusion of dietary guidelines. The guidelines mentioned in both modern and ayurvedic literature should be followed properly and one common combined most effective dietary plan for hypertension should be established for the betterment of the society as currently and in the coming time the issue of hypertension would be increasing. So proper dietary guidelines would not only manage the blood pressure of the people already suffering from hypertension but also prevents the healthy people in developing hypertension in the time ahead due to faulty lifestyle and dietary habits.

#### **CONCLUSION**

In conclusion, a balanced diet, consisting of a variety of foods from different groups, is essential to meet the body's nutritional needs and prevent lifestyle diseases. The evidence shows that unhealthy diets contribute significantly to the burden of diseases like hypertension, coronary heart disease, and diabetes, which can be mitigated through healthy eating and physical activity. Moderation in the intake of fats, salt, and alcohol, along with a diet rich in essential nutrients like potassium, plays a crucial role in maintaining heart health and reducing the risk of chronic conditions. The DASH diet offers an effective plan to control blood pressure, while Ayurveda emphasizes the importance of appropriate food choices and quantities to maintain overall well-being. Additionally, practices like pranayama for stress management can further support health by addressing modifiable risk factors. Together, these strategies highlight the importance of a holistic approach to health, combining modern dietary guidelines with traditional wisdom.

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