Clinical Research

Provocative dietary factors in geriatric hypertension: A surveillance study

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Abstract

Hypertension is the most common psychosomatic disorder affecting 972 million people worldwide being more prevalent in old age. The present survey of hypertensive patients fulfilling the standard diagnostic criteria of WHO/ISH (2004) is carried out in geriatric age group from the Saurashtra region of Gujarat in India to observe the dietary pattern and provocative factors. Total 120 patients of 50 to 80 years of age having systolic blood pressure > 140 mm Hg and ≤180 mm Hg and diastolic blood pressure > 90 mm Hg and ≤110 mm Hg irrespective of gender and religion were selected for the present study. They were interviewed for list of provocative factors enlisted in Ayurveda. As observed, the study supported the facts described in Ayurveda that dietary etiological factors, such as excess intake of Lavana (salty), Amla (sour), Katu (pungent), Tikshna, Ushna (hot), Vidhi (producing burning sensation), Viruddha (incompatible), Snigdha (unctuous), Abhisheyandi (leading to obstruction), Madhura (sweet), Guru (heavy to digest) dietary articles, Ajirmasha (taking diet before complete digestion of previous meal), Adhyashana (repeated eating at short intervals), will vitiate Rakta dhatu as well as Pitta dosha in the body leading to disorders like hypertension. Hypertension in old age is found to be a disease of Vata-Pitta dominant vitiation with the involvement of Rasa, Rakta, Meda as main Dushya (vitiated factors) and dietary factors can contribute to worsening of the disease. The etiological factors having role in the pathogenesis can also be applied for preventive guidelines for the management of hypertension.

Key words: Ayurveda, dietary factors, geriatric age group, hypertension

Introduction

Hypertension is an important public health challenge due to its associated morbidity, mortality, and economical burden to the society affecting about 972 million people worldwide. It is opined that as not a disease entity, rather a product of several etiological processes ultimately leading to the development of hypertension. Hypertension as a disease is not described in Ayurvedic literature; however, its pathophysiology and symptomatology can be traced in many parallel conditions described in the classics. Depending on involvement of Doshas (Vata-Pitta) and Dushyas (Rasa, Rakta, Meda) the spectrum of hypertension is interpreted in terms of Raktavata or Raktagata Vata and in recent years as Vyana Bala Vaishamya/Vyana Bala Vriddhi in Ayurvedic parlance. It is surprising that in spite of all advances in medicine field, exact cause of hypertension is less known. As a result, limited preventive measures could be undertaken.

Government of India initiated a National Campaign on Ayurveda for Geriatric Health Care in 2008 to make aware the elderly population about their health status for preventive, promotive, and curative aspects. The objectives of the campaign are to identify geriatric age-related diseases and to explore the possibilities where Ayurveda can contribute to deliver the goods for healthy dietetics, lifestyle, according to Prakriti (constitution) and to prevent the increasing incidence of geriatric hypertension. The incidence of hypertension increases as age advances irrespective of gender. There are many factors specified in relation to old age (Vardhakya). Ayurveda states Vata Dosha Pradhanata (dominance of Vata), Parihani Kala (declining period of life), Kshiyamana Dhatu (degeneration of body tissues), Paripakwa Sharirthvam (aged body), in old age. Whereas according to modern science thickening of vessel wall, decrease in elasticity and lumen of vessels,
increased vascular resistance, favor the manifestation and exaggeration of hypertension. Human body is nourished by food. Health and disease manifestation are basically outcome of the Ahara (dietary articles). It has direct impact on Agni, which is the prime and ultimate factor responsible for the maintenance of life. Keeping all these views in mind, a survey with the objective to evaluate role of dietary factors provoking hypertension in geriatric age group was carried out in the vicinity of Jamnagar, Gujarat, India.

Materials and Methods

Diagnostic criteria

The standard diagnostic guidelines of World Health Organization (WHO)/International Society of Hypertension (ISH) (2004),[6] and The Sixth Report of the Joint National Committee[7] for prevention, detection, evaluation, and treatment of high blood pressure were adopted for selection of the patients.

Inclusion criteria

1. Patients in between 50 to 80 years of age.
2. Patients presenting with the classical symptoms of hypertension.
3. Those with systolic blood pressure >140 mmHg and ≤180 mmHg and diastolic blood pressure >90 mmHg and ≤110 mm Hg and who are not taking any treatment.
4. Patients on modern antihypertensive treatment with any level of blood pressure.

Exclusion criteria

Patients with accelerated and malignant hypertension and other serious systemic illnesses, such as severe diabetes mellitus, tuberculosis, major endocrine disorders, malignancies, HIV, and renal failure, were excluded. A detailed research proforma was prepared for the survey incorporating diet and other related factors. Direct interview method was done for assessing the association of factors. The duration of study was from June 2008 to March 2010.

Total 120 patients irrespective of gender and religion attending the outpatient and inpatient department of Kayachikita and cases referred by other departments of the institute were selected in the present survey. In present era of stress, considering the onset of hypertension at an early age due to stress-related factors, the lower age limit for the survey was limited to 50 years.

Observations and Results

The observations made on 120 patients of hypertension showed that maximum number of patients (55%) were between age group of 50–60 years; 51.67% were males; 70% were Hindu; 87.50% were married; and 35% were house wives. The 25% each had primary education and were graduates; 41.77% belonged to middle socioeconomic status; 26.67% were consuming betel and cases referred by other departments of the institute was less observed [Table 1].

Elaborated dietetic history showed that maximum number of patients (81.67%) were taking vegetarian diet, same number of patients were found to consume Adhika Lavana (additional intake of salt other than the salt content in diet), Ati-Tikshna Ahara (excess pungent food), and Abhisyandhi Bhojana (heavy to digest and lead to obstruction), Ati-Ushna (excess hot) (78.34%), Vidahi (creating burning sensation) (61.67%), Viruddha (incompatible food) (58.33%), Ati Madhura (excess sweet items) (63.34%), Ati-Snigdha (unctuous) (58.33%), and Ati-Guru (heavy to digest) Ahara (53.34%) were observed in maximum number of patients. In majority of patients Madhura (sweet) (63.34%), Katu (pungent) (58.33%), and Amla (sour) (55%) was observed as dominant Rasa in diet. The 60.24% patients were consuming excess amount of food than needed (Atimatra Bhojana). The 56.67% and 33.33% were following Adhyashana (frequent eating) and Ajeernashana (taking diet before complete digestion of previous meal), respectively.

Predominant chief complaints observed in the patients are presented in Table 2. Analysis of Doshik involvement as per signs and symptoms showed that Gadha-Varchastwam (hard stools) (51.81%) and Anaha (distension of abdomen) (66.26%) in Vata Vriddh in symptoms and Arati (non-desire) (46.10%)

| Hypertension stage (mmHg) | Sitting position | Supine position |
|---------------------------|------------------|-----------------|
|                           | No. of patients | %               | No. of patients | %               |
| **Optimum**               |                  |                 |                 |
| Systolic ≤ 120            | 2                | 1.67            | 3                | 2.50            |
| Diastolic ≤ 80            | 9                | 7.50            | 7                | 5.83            |
| **Normal**               |                  |                 |                 |
| Systolic ≤ 130            | 7                | 5.83            | 4                | 3.33            |
| Diastolic ≤ 85            | 17               | 14.17           | 15               | 12.50           |
| **High**                 |                  |                 |                 |
| Systolic=130-139          | 9                | 7.50            | 9                | 7.50            |
| **Normal**               |                  |                 |                 |
| Diastolic=85-89           | 1                | 0.83            | 4                | 3.33            |
| **Hypertension stage I** |                  |                 |                 |
| Systolic=140-159          | 45               | 37.50           | 41               | 34.17           |
| Diastolic=90-99           | 31               | 25.83           | 40               | 33.83           |
| **Hypertension stage II**|                  |                 |                 |
| Systolic=160-179          | 48               | 40.00           | 51               | 42.50           |
| Diastolic=100-109         | 51               | 42.50           | 37               | 30.83           |
| **Hypertension stage III**|                  |                 |                 |
| Systolic ≥ 180            | 9                | 7.50            | 12               | 10.00           |
| Diastolic ≥ 110           | 11               | 9.17            | 17               | 14.17           |
in Vata kshaya symptoms were the most common findings. In case of Pitta Dosha Prakopa Lakshanas (signs of vitiation), Daha (burning) (36.14%), and Sweda (excess sweating) (16.90%) were found in maximum. In Kapha Dosha Vridhdi (vitiation of Kapha) symptoms, Shwasa (dyspnoea) was found in maximum (33.73%) patients. It was noted that these symptoms are the most common findings predominantly in geriatric hypertensive patients. In Rasa Vridhdi Lakshanas, Hridayotkleda (chest congestion) was found in 49.40%, Praseka (nausea) in 32.53%. The 19.28% of patients showed Shrama (fatigue) in Vata kshaya symptoms. In Rakta Vridhdi Lakshanas, Raktastraksha (redness in eyes) was found in 69.09%. Gurugatrata (heaviness in body) (69.09%), and Udara parshva vridhdi (excess accumulation of fats in abdominal region and flanks) (57.83%) showed Mamsa Vridhdi. Daurbalya (weakness) (69.09%) and Pipasa (excess thirst) (49.40%) indicate Oja and Mutra Kshaya symptoms. In Rasavaha Srotodushi Lakshanas, Aruchi (tastelessness) was found in 48.19%, Ashradhda (aversion to food) in 46.49%, and Sada (slowness) in 31.32% of the patients. In Raktavaha Srotodushi Lakshanas, Annapanasya Vidaha (burning sensation after some time of taking food due to improper digestion) was found in 84.34%; Ati Daurbalya (weakness) in 69.09%; and Lavanasyata (salty taste sensation) in 42.17% of patients was also observed. According to Charaka, thus maintains overall healthy status. According to Charaka, metabolic processes at Agni. This leads to Srotasavarodha (obstruction of channels) which is a prime factor in vitiation Vata Dosha, the main Dosha involved in the pathogenesis of hypertension. In normal state, Vyana Vaya performs its Rasa-Rakta Vikshepana Karma normally. But if it vitiates, Dhama Vayu (contraction of vessels) occurs due to its Raksha (dryness), Shita (cool), and Khara (rough) Gunas, resulting in the reduction of Srotavirana (lumen of the channels). Due to this narrowed pathway, Avarodha (obstruction) occurs

### Discussion

Hypertension is a Vata-Pitta Pradhana Tridosha Vyadhi with Dushya being Rasa-Rakta-Meda Dhatu. Therefore all the etiological factors causing vitiation of Vata-Pitta Dosha, and Rasa-Rakta-Meda Dhatu can be enlisted as the etiological factors for the disease. On analysis, main etiological factors for the disease were observed to be predominant factors in diet of the patients. Constant exposure to these etiological factors augments the process of development of disease.

Agni is the most important factor, which regulates all metabolic processes at Dhatu as well as Mahabhuta level and thus maintains overall healthy status. According to Charaka, Bala (power), Swasthya (health), and Utsaha (enthusiasm) depend on status of Agni. Thus if Agni is impaired, grossly the body functions are impaired. The study had supported this theory of “cause and effect” by the finding that most of the patients were having Mandagni. Ama is the pathogen resulting due to disturbance of Agni. Mandagni and Vishamagni are the prime causes of Ama. This leads to Srotasavarodha (obstruction of channels) which is a prime factor in vitiation Vata Dosha, the main Dosha involved in the pathogenesis of hypertension. In normal state, Vyana Vaya performs its Rasa-Rakta Vikshepana Karma normally. But if it vitiates, Dhamani Sankochha (contraction of vessels) occurs due to its Raksha (dryness), Shita (cool), and Khara (rough) Gunas, resulting in the reduction of Srotavirana (lumen of the channels).

Due to this narrowed pathway, Avarodha (obstruction) occurs

### Table 2: Chief complaints observed in hypertensive patients (n=120)

| Chief complaints observed       | No. of patients | %    |
|--------------------------------|-----------------|------|
| Shirah shoola (headache)        | 62              | 51.67|
| Akshiraga (redness of eyes)     | 52              | 43.33|
| Bhrama (vertigo)                | 69              | 57.50|
| Tamodarshana (blackouts)        | 38              | 31.67|
| Krodhaprarucchata (excess anger)| 46              | 38.33|
| Arati (restlessness)            | 46              | 38.33|
| Alpanidra (less sleep)          | 40              | 33.33|
| Anidra (lack of sleep)          | 15              | 12.50|
| Tandra (lassitude)              | 25              | 20.83|
| Swedadhikya (excess perspiration)| 50             | 41.67|
| Feeling of tension              | 46              | 38.33|
| Palpitation                     | 39              | 32.50|
| Tingling                        | 29              | 24.16|
| Breathlessness on exertion      | 54              | 45.00|
| Santapa (rise of temperature)   | 40              | 33.33|
| Klam (fatigue/easy fatigability)| 70              | 58.33|
| Shrama (fatigue)                | 50              | 41.67|
| Mada (excess lust)              | 10              | 8.33 |
| Buddhisammohas (confusional state) | 15             | 12.50|
| Alasya (sloth)                  | 45              | 37.50|
| Gurugatrata (heaviness in body) | 49              | 40.83|
| Pipasa (excess thirst)          | 32              | 26.67|

### Table 3: Geriatric signs and symptoms observed in hypertensive patients (n=120)

| Chief complaints | No. of patients | %    |
|------------------|-----------------|------|
| Twak Parushata   | 36              | 30.00|
| Shliatha Sara    | 86              | 71.67|
| Shliatha Mamsa   | 81              | 67.50|
| Shliatha Asthi   | 85              | 70.83|
| Shliatha Sandhi  | 95              | 79.17|
| Dhatu Kshaya     | 82              | 68.34|
| Kayasya Avanamana| 9               | 7.50 |
| Vepathu          | 12              | 10.00|
| Khatiya          | 96              | 80.00|
| Vali             | 75              | 62.50|
| Paliyta          | 98              | 81.67|
| Kasa             | 19              | 15.84|
| Shwasa           | 53              | 44.17|

Medha Hani

| Vyana Vaya Hani | %    |
|-----------------|------|
| Grahanahani     | 38   | 31.67|
| Dharanahani     | 48   | 40.00|
| Smaranahani     | 65   | 78.31|
| Vijnanahani     | 9    | 7.50 |
| Vachanahani     | 1    | 0.84 |
| Utsaha Hani     | 63   | 52.50|
| Parakrama Hani  | 93   | 77.50|
| Drishthi Hras   | 65   | 54.17|
| Kamendriya Hani | 27   | 22.50|
| Buddha Hani     | 21   | 17.50|

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in Rasa-Rakta-Vikshepana Karma, causing forceful function of Vyana Vaya with increase of its Chala Guna. This makes the pressure to rise in the wall of Dhamanis. It can be stated that Mandagni[12] and hence Ama are important factors involved in the causation and exaggeration of hypertension in old age.

Koshtha determines the bowel habit of the individual. Maximum patients reported Kura Koshtha, denoting Vata dominance.[13] Krura Koshtha individuals makes it a habit of not to pass the stools regularly. In hypertension, due to the underlying Vata-dominant pathology, Vibandha (constipation) may occur leading to obstruction and worsening of the condition. It is supported by the finding that most of the patients had irregular bowel habits (Asamayak Mala Pravritti) and constipated bowels. It is known that Apana Vikriti causes Asamayak Mala Pravritti[19] and it maintains the other four Vayus. Pakwashaya (colon) is the seat of Apana Vayu,[13] which is also a specific site of Vata Dosha.[16] The role of Apana Vayu in Aharpachana (digestion of food), is mainly due to its “Shakrit Nishkramana Kriya” (excretion of feces). Thus, the Apana Vikriti produces Samana Vikriti leading to Asamayk Pachana (improper digestion) and leading to Asamayk Dhatu Upstatti (improper formation of tissues) as Samana Vata has got predominant role in the regulation of Jatharagni[17] and its méotics. Thus, irregular Mala Pravritti (bowl habit) and constipation indirectly can aid in causing Shonita Dushhti (blood impurities). In Vata Vridhhi symptoms, maximum patients had Gadha-Varchastwam (51.81%) and Anaha (66.26%). These findings also indicate towards the disturbance of Vatansulomana (proper circulation of Vata), which can lead to Udavarta. The data show that these factors have a role in precipitation and aggravation of the disease in old age. Moreover Vriddhavastha[18] is most favorable period for vitiation of Vata and hypertension is primarily a disease of Vatika disorder.

The dietary habits of a person are based on the choice, availability, and religious customs. Diet is more important than the medicine itself, which is quite evident from the famous statement that if one follows or practices the Pathyavevana (following suitable regimen), does not require any medication.[19] Diet depends on various factors, such as taste, mood, presentation of food, place of eating, and hunger as well. Different dietary articles due to their specific Rasas, properties (Vishishta Shaktitrat Dravyanam),[20] if consumed without following the rules of proper dietary intake (Akha Vidhi Visheshayatanan), can lead to manifestation of disease by vitiating Doshas and deteriorating the healthy status of Dhatus. The Rasas according to the Samanya-Vishishta Siddhanta lead to the vitiation and pacification of corresponding Doshas by their Prabhava.[21]

Adhika Lavana Sevana (excessive intake of salt), had received a greatest attention among all. It is mentioned that, the Bahlika, Satarashtri, Saindhiwa, and Satorikra people, take more intake of Lavana (and even consume it along with milk), which is the main etiological factor in pathogenesis of hypertension.[22] The data of study also supports this as maximum indulged in consuming Adhik Lavana. Lavana Rasa is having dominancy of Teja and Jala Mahabhuta. In small doses, salt can be used continuously in the preparations of dietary articles but continuous use in large doses is harmful. All Lavana are mentioned as Ushna, Tiktsha, Anatisnigda, Anutigura, Upakledi (deliquescent), Sara, Vikasi, Adha Sranshi, Avakashakara, Vishyandi, Sukshma, Saraka, and Mrudu in nature.[23] Ati-lavana intake leads to increase of Abhishyandi, Sukshma, Ushna, and Vyavayi Guna in the body.[24] This in turn results into vitiation of Pitta Dosha in terms of Ushna, Tikshna Guna due to Samanagunaabhyajishtata.[25] Further aggravation of Rakta (Raktam Vardhayati) develops due to Rakta-Pitta-Ashryashrayi Bhava.[26] This effect is due to Sukshma Guna (penetrating power in microchannels), and Vyavayi Guna (spreading of the Dravya all over the body).[27] On the other hand, it liquefies Kaptha Dosha (Kapham Vyayandayati) due to Samanagunata. The Abhishyandi Guna leads to obstruction in the Rasavahi Siras,[28] causing Vata obstruction and hypertension. The Vishyandana effect (Sravayati) increases osmolarity and increased extracellular fluid volume with increase in calculated osmolarity. This increases blood pressure showing the way to volume-loaded hypertension. The Vata dosha due to Viparita Gunata is unable to pacify efficiently with the changes (Vata-Sneha-Gaurava-Abhishvat).[29]

Excessive use of Lavana is described as the cause of Shonita Rogan[30] and it causes increase the blood.[11] Likewise in Ucchralakshatapa (raised blood pressure), Rakta is also vitiated. It is also perceptible that Lavana Rasa is mentioned under the articles, which are specially indicated for not to be consumed in excess and for longer duration.[12] When excessively used, it produces fatigue, lassitude, and weakness of the body,[33] which are the symptoms observed in the patients of hypertension. People who are accustomed to excessive use of salt, suffer from premature baldness, greying of hairs, and wrinkles in the skin. Excessive use of Lavana Rasa thus can hasten the aging process aggravating the course of hypertension in geriatric people.

Even a small increase in extracellular fluid and blood volume, can often increase arterial pressure greatly. It ultimately leads to increase in cardiac output, which in turn increases arterial pressure through its direct as well as indirect effect. This leads to secondary increase in total peripheral resistance resulting from the autoregulation mechanism. It greatly elevates the arterial pressure than it is expected. The amount of salt that accumulates in the body is the main determinant of the extracellular fluid volume. Even a small amount of extra salt in the body can lead to considerable elevation of arterial pressure. As the salt is not excreted so easily like water, it accumulates in the body. Excess salt in the body produces increased osmolarity thereby stimulates the thirst centre, making the person to drink more amount of water to dilute extracellular salt to a normal concentration, thus indirectly leading to increase in extracellular volume. This is also achieved by another mechanism through stimulation of hypothalamic–posterior pituitary gland secretory mechanism in response to the increased osmolarity in the extracellular fluid. This leads to secrete increased quantities of antidiuretic hormone, which causes the kidneys to reabsorb greatly increased quantities of water, thereby diminishing the volume of urine while increasing the extracellular volume.[14]

Excessive use of Katu (pungent) Rasa intake leads to fainting (Murchha), vertigo (Bhrama), thirst, tremor[15] and contraction of blood vessels.[16] The Mahabhautik composition of Katu rasa is Vayu and Agni Bhuta dominant. Katu Rasa dominant Dravyas are usually having Katu Vipaka and Ushna Virya and thus leading to Pitta Prakopa. As we know the Pitta
and Rakta live symbiotically, the Pitta vitiation thus leads to Rakta Dushti. Thus, it can be inferred that the Katu Rasa and Ushna Virya are one of the causes of Shonita Dushti. Also due to its Laghu and Raksha Gunas excessive consumption of Katu Rasa can cause the vitiation of Vata Dosha. This Vata-Pitta vitiation and Rakta Dushti is the basic pathology involved in the causation of hypertension.

Excessive Madhura Rasa (sweet taste) intake leads to diseases related to Medusa, Shleshma, obesity, loss of appetite, coma, diabetes,[17] heaviness, and weakness.[18] Obesity was observed as major concomitant factor in 70% patients among whom 40% were having grade II obesity with body mass index between 27 and 40 kg/m². This finding is suggestive of probable friendship of hypertension and obesity. Madhura (sweet), Guru (heavy), and Snigdha (unctuous) articles of the food are predominant in the qualities of Prithvi and Apa Mahabhuta. Thus these articles, being suppressors of appetite by nature impair, the digestive power, and are extremely harmful, if taken in excess. There is a need of strong digestive power and metabolism achieved by physical exercise.[19] Thus excessive intake of such articles can aid in provocation of hypertension in senile people.

Excessive Amla (sour) rasa intake leads to Kaptha, Pitta, and Asra Prakopha, Shathihya (loss of function), Vertigo.[20] Raktadushti.[21] It is also having Ushna virya, which again causes Pitta vitiation and ultimately Rakta dushhti. The Mahabhautik composition of Rakta dosha is predominantly Jala and Agni Mahabhuta. Guru, Snigdha, and Ushna Virya Dravyas are mentioned as to cause Shonita Dushti.

The Abhisheyandi dietary articles, such as Dadhi, produce Gaurava and Karshy[22] in the body by obstructing the channels of circulation of rasa (Rudhva Rasavaha Siraaha) due to their Picchila and Guru Gunas (properties). The continuous and at a time (Ekakala/Yugapat) circulation of Rasa Dhatu is carried out by the normal functioning of Vyana Vayu all over the body.[13] Hence nourishment of all Dhatus (tissues) take place continuously and in circulatory fashion (Parirudditistu Chakravat). By obstructing the channels of circulation (Strotodratha), these articles cause vitiation of Vata leading to improper circulation of Rasa (Aha Rasa) resulting in emaciation (Dhatubhshayam/Karshyam Karoti), which again hastens the process of aging and degeneration. This again leads to Vata Prakopa. In this way, the vicious cycle develops and all the factors again ultimately precipitate hypertension in Vata pradhana life span, that is, old age.

Faulty dietary habits, such as Adhyashana, Ajirnashana, Visharmanashana (taking compatible and incompatible food at wrong time), Anashana (not taking food when needed) were found in maximum. The dietary habit is regulated mostly by behaviour and life style pattern. Diet has got direct impact in causing Mandagni, thereby Ama production. All of the above habits lead to improper digestion of food, vitiation of Agni[23] itself leading to Grahami Doshha resulting into Ama, which is the most important causative factor in the pathogenesis of disease. This formation of Ama, impairment of Agni, also creates the obstruction in the normal circulation of Vyana Vayu. Improper quantity food is again of two types Hinamatrarn (deficient in quantity) and Atrimatrarn (excessive in quantity).[24] The Anashana habit also leads to Mandagni, as long waiting for food increases gastric secretions more, resulting in the increased quantity of Drava Rupa Pitta, which is ineffective to digest the food, directing Mandagni and consequently Amolpati.[25] Ati-Ahara Sevana leads to Yugapata Tridosha Prakopa.[26] Gastric juice varies in both amount and composition with the food taken. The duration of secretion and the time during which food remains in the stomach also becomes longer as the quantity of the food increases (Adhyashana).[27] Adhyashana, Ajirnashana, and so on are mentioned in Rakta dusthikara nidana.[28] It is always customary that one should take the food only when the previous food is digested. If the person indulges in Ajirnashana, that is, taking food before the digestion of previous meal, the digestive product of previous meal (undigested Rasa) gets mixed up with the product of food taken afterward, resulting in the provocation of all the doshas instantaneously, which can aggravate the manifestation of the disease.[29] Vishamansana, that is, irregular timings and quantity of the food leads to indigestion. Thus due to the impaired digestion, the Ardhapakva, Apaka, and Pakva Aahara Rasa produce Vidagdhavastha (Shuktata).[30] This Shuktata produces Pitta Kopā and consequently Shonita Dushti. Viruddhshansana is being directly accepted as a cause of Shonita dushhti.[31] Thus the data shows that these improper habits and dietary articles can aid to cause Shonita Dushti and hence precipitating the occurrence of the disease.

These dietary factors hasten the progressive changes of aging observed through signs and symptoms enlisted in the Tables 2 and 3. These ultimately worsen the degenerative pathologic changes in hypertensive patients. Hypothetically it can be stated that the aggravated Vata and Pitta in case of hypertension hastens aging process, but the relationship between hypertension as provoking factor to enhance aging is essential to be supported by robust clinical data.

The triad of chief complaints, that is, Shirah shoola (headache), Bhrama and Klama (fatigue/easy fatigability), which are found most prevalently are supportive to the underlying pathologic status of Vata-Pitta dominance and thus also proves the theory of cause and effect (Karya-Karanavada) of Ayurveda as most of the etiologic factors are found to be causing the vitiation of Vata and Pitta. These symptoms can be considered as the cardinal signs and symptoms of hypertension. Aruchi and Ugdarabahulya are indicative of Ama dominant obstruction and disturbances in Vatamulomana in underlying pathology.

Thus the present article establishes the fact that the faulty dietary habits, such as Ajirnashana, Adhyashana, and certain dietary qualities, such as excess intake of salt, pungent items can vitiate the Rasa, Rakta owing to disturbance in Agni and formation of Ama. This obstructs the channels and leads to vitiation of Vata-Pitta Dosha. Thus it disturbs the normal circulatory functioning of Vata particularly Vyana Vata resulting into hypertension. The pathogenesis of hypertension in Ayurveda and above relevant discussion is presented in Figure 1.

**Conclusion**

The present survey study supported the facts described in Ayurveda that the dietary etiologic factors, such as much intake of Lavana, Amla, Katu, Tikshna, Ushna, Vidahi, Viruddha, Snigdha, Abhisheyandi, Madhura, Guru dietary substances can lead to vitiation of Rakta Dhatu as well as Pitta Doshha in the body leading to disorders, such as hypertension. Hypertension in old age is found to be a disease of Vata-Pitta Pradhana...
Doshik vitiation, Rasa, Rakta, Meda being main Dushybas involved. Various dietary factors and habits enlisted can contribute to hypertension specifically in old age. The etiologic factors observed in the present study can have the role in the pathogenesis of hypertension and can be used as guidelines for deciding the Ayurvedic principles of management for hypertension accordingly. Healthy dietetics and healthy life style as per the Prakriti of an individual along with the possible use of medications will certainly bestow the tangible results because both are complementary and supplementary to each other. The study conveys the message that Ayurvedic dietary guidelines are to be followed and adopted in order to prevent hypertension in geriatric population. Also in known hypertensive patients, this will be helpful to control the blood pressure within range and to minimize the medication. This article substantiates the Ayurvedic references with data.

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