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Review Article

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## Management of Pediatric Hypertension through Ayurveda

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**Abstract:** Every individual of this universe want to spend longevity & disease free life pattern and same hope for their children. But their changed lifestyle as well as feeding habits along with not practicing Ayurvedic principles such as regular exercise, avoidance of junked food items, oily spicy foods, polluted foods, veerya virudha foods and Ahara vidhi vidhan create a lot of health related disorders. Hypertension is one of them. Still perusal to Ayurvedic texts provides no straight reference to hypertension but on tunnelling down the texts and arranging the scattered references from different texts, this is evident that hridya and process of Rasa Vikshepa or anudhavana by Vyana Vayu has become helpful to understand the hypertension. Vitiated vata dosha was thought to be chief culprit, as the dhatu gati (Rasagati or Vikshepa) is performed by Vayu itself. Pitta and Kapha compliment the effect of vitiated vata and aid the process of disease progression, with Rasa rakta (whole blood) being the chief mediator of vitiation. Hence, the concept goes in accordance that the disease is Tridoshaja. Management in modern

science includes both pharmacologic and non pharmacologic aspect with a lot of adverse effects. Therefore whole universe looks towards Ayurveda for its better & safe treatment. In this article attempt has been made to explore the scientific evidences with the available references to illustrate the possible mechanism & its management.

**Keywords:** Ahar vidi vidhan, Vyana vayu, Vata, Pitta, Kapha, Hypertension

## INTRODUCTION

Hypertension (HTN) or high blood pressure, sometimes called arterial hypertension, is a chronic medical condition in which the blood pressure in the arteries is elevated. Hypertension in children and adolescents continues to be defined as systolic BP (SBP) and/or diastolic BP (DBP) that is, on repeated measurement, at or above the 95<sup>th</sup> percentile. BP between the 90<sup>th</sup> and 95<sup>th</sup> percentile in childhood had been designated “high normal.”<sup>1</sup> To be consistent with the *Seventh Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC ), this level of BP will now be termed “prehypertensive”.<sup>1</sup> Neonatal hypertension is very rare, only seen in less than 0.2 to 3% neonates and can be overlooked several times due to blood pressure not measured routinely in the healthy newborn. Hypertension is more common in high risk newborns. A variety of factors, such as gestational age, post conceptional age and birth weight needs to be taken into account when deciding if a blood pressure is normal in a neonate<sup>2</sup>.

## CLASSIFICATION OF HYPERTENSION

Hypertension is classified as either primary or essential hypertension and secondary hypertension, about 90–95% of cases are categorized as "essential/idiopathic/primary hypertension" which means high blood pressure with no obvious underlying medical cause. The remaining 5–10% of cases (secondary hypertension) is caused by other conditions that affect the kidneys, arteries, heart or endocrine system.<sup>2</sup> Essential hypertension rarely is found in children younger than 10 years and is a diagnosis of exclusion. Significant risk factors for essential hypertension include family history and increasing BMI. Essential hypertension often is linked to other risk factors that make up metabolic syndrome and can lead to cardiovascular disease. These risk factors for metabolic syndrome include low plasma high-density lipoprotein, elevated plasma triglycerides, abdominal obesity, and insulin resistance/hyperinsulinemia. The prevalence of metabolic syndrome among adolescents is between 4.2 and 8.4 percent<sup>3</sup>.

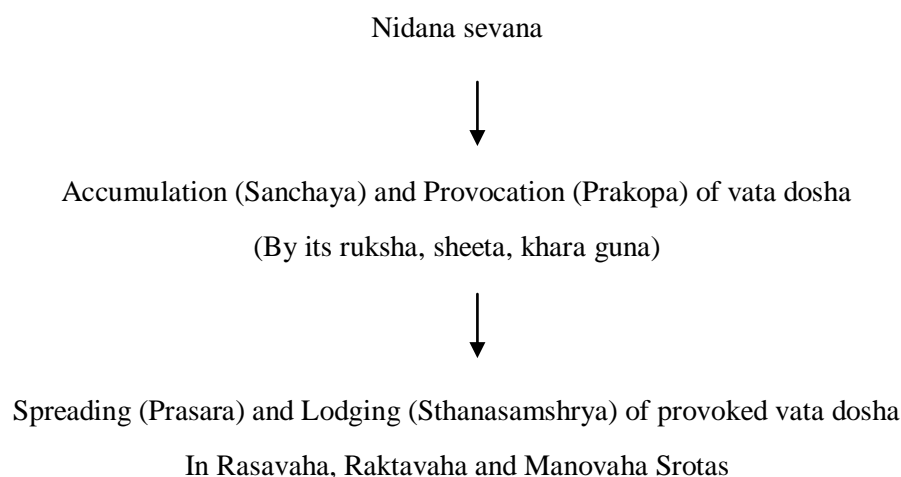
The essential hypertension, commonest form of adult hypertension has its genesis in the pediatric population. Therefore blood pressure should be measured routinely as a part of the physical examination of children of all ages so that early detection, investigation and treatment can be initiated if hypertension is present. Every child over the age of 3 years should have his blood pressure taken once a year and at every visit to the doctor during adolescence<sup>4</sup>.

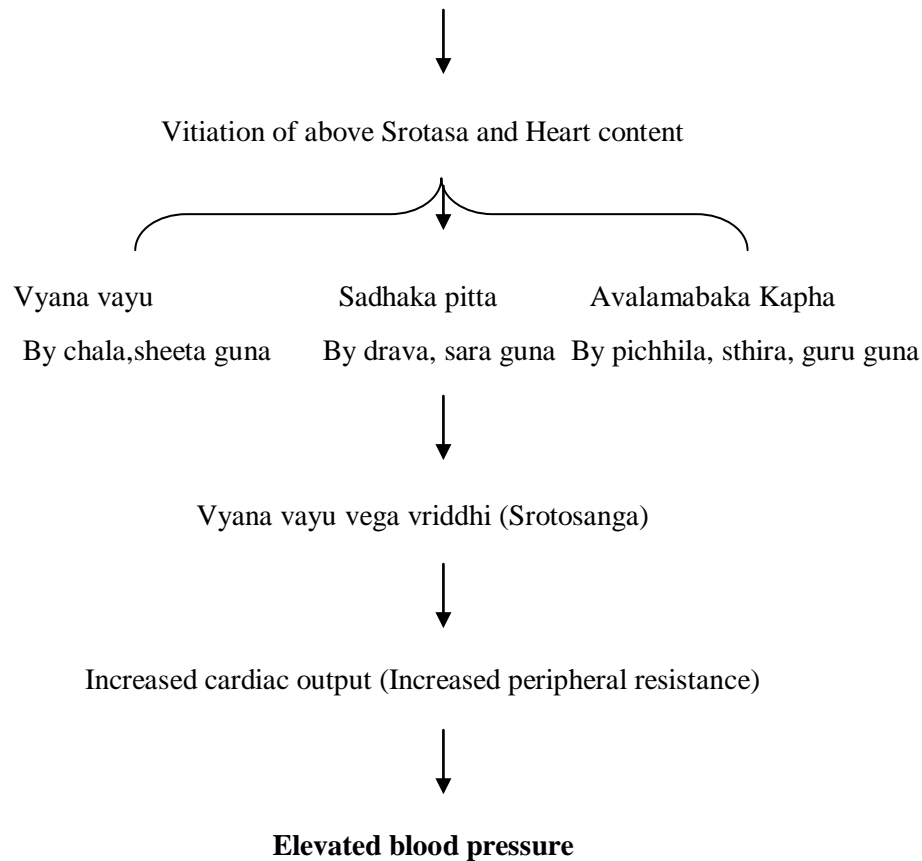
Secondary hypertension is more common in children than in adults. It can be present in adolescents, especially if they have physical findings not typically seen with essential hypertension. Renal disease is the most common cause of secondary hypertension in children<sup>5,6,7</sup>. Transient rise in blood pressure, which can be mistaken for hypertension, is seen with caffeine use and certain psychological disorders (e.g. anxiety, stress).

**CAUSES OF CHRONIC HYPERTENSION IN CHILDREN**

Vascular	Coarctation of aorta Umbilical artery catheterization Renal artery stenosis Renal vein thrombosis Renal Arteritis with or without aortitis
Renal	Chronic Glomerulonephritis Chronic pyelonephritis Hydronephrosis Vesiculo-ureteral reflux nephropathy Renal tumors Malformations of Kidney (polycystic/segmental hypoplasia, Multicystic kidney)
Endocrinal Disorders	Cushing syndrome Neuroblastoma Pheochromocytoma Congenital adrenal hyperplasia
Other causes	Intracranial mass Hemorrhage Essential hypertension

Ayurvedic classics have been supposed to be the oldest medical literatures available so far in the world. It is astonishing that no discussion has been found to be included in those literatures which exactly simulate essential hypertension. It does not mean that the ailment was not there in those days. This is evident that the change in social and economic conditions, life style, dietary habits and an increasing stress and strain in their academics increases the frequency of this disease many folds and this increase necessitates the scientists to describe it in detail. Different condition like Dhamani paripurana, Vyanbala vaishmya, dhamani Praticaya, siragata vata, raktavurit vata can be correlated with hypertension. Hridya and process of Rasa Vikshepa or anudhavana by vyana vayu has become helpful to understand the hypertension. Vitiated vata dosha was thought to be chief culprit, as the dhatu gati (Ras gati or Vikshepa) is performed by vayu itself. Pitta and kapha compliment the effect of vitiated vata and aid the process of disease progression, with Rasarakta (whole blood) being the chief mediator of vitiation.

**PATHO PHYSIOLOGY OF HYPERTENSION AS PER AYURVEDA**



In pathogenesis of Uchcharaktachapa, Vata (Vyana & Prana), Pitta (Sadhaka), Kapha (Avalambaka) and Manovaha srotas involving Hridaya, Rasa-Rakta samvahana and Oja are main responsible factors. They are vitiated due to disturbed psychological factors/ Manasika Bhavas like Chinta (Anxiety), Tanav (Stress), Krodha (Anger) etc. producing hypertensive state. That's why Acharya Charaka has advised to control Manasika Bhavas<sup>8</sup> so those type of drugs/therapy should be given which affects these Manasika Bhavas and other responsible factors.

The factors responsible for the changes in the homeostasis causing hypertension are rasa rakta paribharmana, manovaha srotas, vatavaha sansthan, dosha vivechana. Hridaya is the chief organ of rasa raktavaha sansthan which plays main role in rasa rakta samvahana through dhamani, sira and srotas with the help of vyana vayu and nourishes the whole body tissues. It performs the function of sankoch (systole) and prasara (diastole) continuously in rhythmic manner. Rasa rakta srotas – the channel of circulation are predominately involved in case of hypertension. Acharya Charaka opines that the dietary factors like Guru, Sheeta, Atisnigdha, Atimatra bhojana and the situations like Atichinta are responsible for rasavaha srotodushti which leads to vitiation of vata dosha which causes raktagata vata.<sup>9</sup>

Acharya Charaka quoted that Chinta (worry), Shoka (grief), Krodha (anger), Harsha (enthusiasm), Lobha (greed) are some factors which causes vitiation of doshas and these vitiated doshas reach Hridaya and causes manovaha srotas vikara.<sup>10</sup> These vitiated doshas are probably likely to be involved in the induction of hypertension.

Vata dosha is the prime driving force to manage all kinds of movements in the body.<sup>11</sup> In normal healthy person; it maintains pressure and normal flow of blood inside the channels. But when vata dosha is vitiated, it results into abnormal pressure (i.e. high/low blood pressure). In the pathogenesis of hypertension, Vyana vayu along with Prana and Apana vayu gets affected. In normalcy, the waste

products of the body are expelled out from body by Apana Vayu in the form of urine and feces.<sup>12</sup> as we know vrikka is the organ which participates in the formation of urine and when functioning properly, it maintains Sharirika Kleda in physiological proportion. While in pathological condition, this Sharirika Kleda accumulates in the body and causes different type of disorders related to the formation and excretion. Vitiating of Vyana Vayu leads to disturbance of rasa samvahana to vrikka (reduced blood flow) which further leads to reduced formation of urine leading to accumulation of Kleda (mala sanchaya).<sup>13</sup> This accumulation has some relation with formation of ama which has capability to obstruct the small channels of the body at cellular and capillary level.

### SAMPRAPTI-GHATAKAS

Doshas:	Vata Pradhan (Prana, Vyana, Apana) Pitta (Sadhaka, Pachaka) Kapha (Avalambaka)
Dushyas:	Rasa-Rakta
Agni:	Jatharagni-Dhatwagnimandya
Vyadhi:	Rasagata
Srotasa :	Rasavaha, Raktavaha & Manovaha
Srotodushti:	Atipravati, Sanga
UdbhavaSthana:	Amashaya samudbhava
Avayava:	Hridaya, Dhamani
Adhisthana :	Manodaihika (Psychosomatic) (Sira, Dhamani, Srotas)
Sanchara-sthana:	Sarva Sharira
Swarupa :	Chirkari
Prabhava:	Kashta-sadhya

### SYMPTOMS

On objecting the cardinal sign and symptomatology of the disease to Ayurvedic fundamentals, it is evident that there is predominance of Vata Pitta Dosha and Kapha as its accompaniment with Rasa Rakta dusti. Dhamani uplepa is one of the main incidences in Uccharaktachapa and is stated in Kapha Nanatmaja vyadhi.<sup>14</sup> Hence the Uccharaktachapa (EHT) can be assigned as Tridoshaja vyadhi with predominance of Vata and Pitta.

Shiroruk (Headache), Bhrama (Giddiness), Nidranasa (Insomnia), Smritihrasa (Impaired Memory), Alpadharanshakti (Lack of Concentration), Karnanada (Tinnitus), Murchha and Sanyasa (Syncope and Coma), Akshepa (Convulsion), Ati-Daurbalya (Weakness), Klama (Easy Fatigability), Tamodarshana (Flashes before eyes), Akshiraga (Redness of eyes), Pada-Sotha (Pedal-Oedema), Shvaskrichhta (Breathlessness), Hrid-dravata (Palpitations), Uraha-Shula (Chest pain), Krodha-pracurata (Anger), Prabhuta-mutrata (Polyurea) and Supti (Tingling / Numbness in the limbs).<sup>15,16</sup>

### DIAGNOSIS

The first and most important step in the diagnosis of hypertension is proper recording of the blood pressure. Several recordings are important before labeling a child as suffering from hypertension. Once hypertension has been confirmed, an extensive history and careful physical examination should

be conducted to identify underlying causes of the elevated blood pressure and to detect any end-organ damage. Young children, those with stage 2 hypertension and those in whom a systemic condition is suspected require a more extensive evaluation because these children are more likely to have secondary hypertension. The child, who is older or obese, with a family history of diabetes or other cardiovascular risk factors, will require further work-up for the metabolic abnormalities associated with primary hypertension.<sup>4</sup> only after confirming hypertension investigations should be planned. No need to do battery of investigations in all children. Start with investigation for commoner cause and consider advanced investigations later to confirm the diagnosis. The investigations for hypertension include hemogram, urine analysis, urinary electrolytes, blood urea, nitrogen, serum creatinine, chest X ray, echocardiography and angiography etc.

## MANAGEMENT

Managing childhood hypertension is directed at the cause of the elevated blood pressure and the dosha equilibrium in the body. Therefore the line of treatment of hypertension is like:

- (1) **Nidana parivarjana** (treat the cause) avoidance of etiological factor.
- (2) For children and adolescents with prehypertension or stage 1 hypertension, therapeutic lifestyle changes are recommended. These include-
  - a) Maintain normal body weight if obese. Reduction in weight by 1 kg can reduce the 1.6/ 1.3 mm Hg of blood pressure.<sup>17</sup>
  - b) Life style Modification- Regular exercise<sup>17</sup> (Pranayama, Yoga and Meditation)
  - c) Low-fat and low-sodium diet<sup>18,19</sup>
  - d) Increased dietary fibers in diet<sup>18</sup>
  - e) Cessation of smoking in adolescent age group<sup>20</sup>
  - f) Abstinence from alcohol use in adolescents<sup>20</sup>
  - g) Proper sleep at night
  - h) Minimize stress, tension and anxiety
- (3) **Samsodhana therapy:** these include-
  - a) Virechan<sup>21</sup>- given by Eranda Sneha.<sup>22</sup>
  - b) Shirodhara with Kshira or takra will provide the symptomatic relief from hypertension.<sup>23</sup>
  - c) Lekhan basti- it is indicated in every adult patient but should be avoided. If needed than usual age of child should be more than 5 year with severe hypertension.<sup>23</sup>
  - d) Raktamokshana- initially avoided but in malignant hypertension of age group above 10 year, lesser amount of blood letting is indicated.<sup>21</sup>
- (4) **Samshaman therapy:** following drugs in combination or individually can be effective to lower blood pressure but should be administered as per age & body weight in children.<sup>24</sup>
  - a) Raktabhara shamaka- Sarpagandha
  - b) Mutravirechaniya- Punarnava, Gokshura, Kusha
  - c) Sangyasthapana- Vacha, Jatamansi
  - d) Hridaya – Arjuna
  - e) Medohara- Lasuna, Guggulu, Methi
  - f) Vedanashamaka- Lasuna, Guggulu, Tagar
  - g) Medhya rasayana – Yashtimadhu, Shankhapushpi, Guduchi, Mandookparni<sup>24</sup>.

## CONCLUSION

In nutshell, it can be concluded from scattered references that hypertension is a Vata-Pitta predominant tridoshaja vyadhi and the Rasa Rakta are the chief culprits. Essential Hypertension is a psychosomatic hemodynamic disease with a multi-factorial pathology originating from several dietary, environmental and genetic factors. Manasa Bhavas like Chinta (worry), Krodha (Anger), Bhaya (Fear) etc. play an important role in the aetiopathogenesis, progression and prognosis of disease as well as response to the treatment. Modern system of medicine has already invented so many medicines, to keep the blood pressure in its normal ranges. But all these Drugs have a long list of adverse effects with them. On contrary, Ayurvedic management provides safe and effective remedies and has no untoward effects which is really of great value and benefits to the patients and is of vital importance in view of global acceptance. Numerous researches have been done again to reprove the worth of these time tested medicaments. Yet, there is a necessity for pursuing further research to find out some safe and effective therapy.

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