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Anti-Hypertensive Efficacy Of Combination Therapy Of Sarpagandha Vati With Anuloman Chikitsa (Haritaki Churna)" On Vyana Bala Vaishamya(~Hypertension)- Randomised Clinical Trial

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Abstract
Hypertension is a common health problem that significantly raises the risk of heart disease, stroke, and kidney damage. Understanding it through both Ayurveda and modern medicine can offer more complete management strategies. In Ayurvedic thought, hypertension aligns with ***Vyana Bala Vaishamya****, a condition in which Vyana Vayu—the dosha responsible for the circulation of blood and vital fluids—becomes unbalanced or overactive. This disturbance often involves aggravation of the* ***Vata*** *dosha, frequently also* ***Pitta****, which affects vascular health and blood flow.*
Modern medicine defines hypertension by specific blood pressure thresholds. For instance, recent guidelines have set the cutoffs at around ***130/80 mmHg*** *for Stage 1 hypertension, with higher values defining more severe stages. Treatment involves both lifestyle changes (such as diet, exercise, stress reduction) and medications—diuretics, angiotensin receptor blockers, beta-blockers, calcium channel blockers, etc. Each of these works through different mechanisms (e.g. reducing fluid volume, lowering heart rate, relaxing vascular smooth muscle), but long-term use can lead to side effects, and patient adherence can be an issue.*
This study demonstrates that hypertension (Vyana Bala Vaishamya) is heavily affected by both non-modifiable factors—such as age and family history—and modifiable ones, including levels of physical activity, sleep habits, and overall lifestyle. The study revealed that most patients exhibited moderate to mild symptom improvement, with significant decreases in both Diastolic and Systolic blood pressure measurements. Furthermore, the Combination therapy of sarpagandha vati with anuloman chikitsa significantly mitigated mental health symptoms, including Anidra and Shirashoola, suggesting its viability as a therapeutic intervention for stress-induced hypertension.
keywords*: Hypertension, Blood Pressure, Vyana Bala Vaishamya, Anuloman Chikitsa- Sarpagandha Vati, Vyana Vayu, Systolic Blood Pressure, Diastolic Blood Pressure.*

INTRODUCTION: *Vyana Bala Vaishamya* refers to an imbalance in the *Vyana Vayu*, which can lead to the manifestation of diseases symptoms[1]. *Vyana Bala* refers to the exertion of force by Vyana Vayu on the organs in which it resides and travels inside the body. *Vyana Vayu* is widely dispersed and flows throughout the body, mostly residing in the thoracic area known as *Hridaya*[2]. *Vyana Vayu* facilitates the continuous and uniform distribution of *Rasa Dhatu* throughout the entire body. The term "*Rasa-Rakta*

[1] Charaka. (ca. 100 BCE). *Charaka Saṁhitā* (Sūtrasthāna 28.7). Trans. by P.V. Sharma. Varanasi: Chaukhamba Orientalia.
[2] Paradakara H, editor, (First edition). Commentary of Arunadatta and Hemadri on Ashtanga Hridaya of Vagbhatta, Sutrasthana; Doshabhediya Adhyayam: Adhyaya 12, Sutra 06. Varanasi: Chaukhamba Sanskrit Sansthan, Reprint 2010; 193

Samvahana"[3] can be understood as the closed circulation of blood. Due to its location in the thorax and heart, *Vyana Vayu* is responsible for regulating circulation. Consequently, any malfunction of *Vyana Vayu* could lead to a disturbance in the normal circulatory system.

Hypertension, or high blood pressure, is a condition in which this pressure rises to abnormally high levels, potentially leading to damage of blood vessels and an increased risk of cardiovascular diseases, stroke, and other systemic complications[4].

Criteria for normal blood pressure, pre-hypertension and hypertension (stage1 and stage2) have been recently revised in2018 by AHA/ACC (American College of Cardiology and American Heart Association). According to this criteria -

- Normal cut-off values for systolic and diastolic blood pressure are taken as < 120 and <80 mmHg respectively
- Arterial blood pressure is considered elevated at SBP OF 120-129 AND DBP OF <80 mmHg
- As per this criteria, arterial or systemic hypertension in adults is defined clinically as persistent elevation of systolic blood pressure of >130mmHg, or diastolic pressure of >80mmHg, and is graded into stage 1 and stage 2 as under:

• Stage 1 Hypertension is SBP OF 130-139 mmHg, or DBP OF 80-89mmHg.

• Stage 2 Hypertension is labeled in cases with corresponding values of SBP as >/= 140 mmHg and DBP as >/=90 mm Hg. The diastolic pressure is often considered more significan.

The force exerted on the blood vessels is due to the *Vyana Vayu*, which circulates throughout the body and is situated in the *Hridaya*, the central hub of the circulatory system. Therefore, called *Vyana Bala Vaishamya*.

In the pathogenesis of hypertension, a predominant ***Vata Prakopa*** is observed, particularly involving ***Vyana Vata***, which governs ***Rasa-Rakta Samvahana***. Due to the ***Ruksha***, ***Sheeta***, ***Khara***, and ***Chala*** properties of aggravated Vata, the ***Rasa-Raktavahini Dhamanis*** tend to become constricted. Moreover, the ***Ruksha*** and ***Chala*** attributes contribute to the drying and depletion of ***Mala-roopa Kapha*** present within the inner lining of the vessels, resulting in increased rigidity and decreased elasticity of the vascular walls. This leads to a narrowing of the lumens of the blood vessels, causing obstruction in the flow of blood. Therefore, the therapeutic approach to managing ***Vyana Bala Vaishamya*** **(Hypertension)** may involve the administration of ***Vatanashaka Chikitsa*** [5].

It is believed to be vata dosha to be chief culprit,it hampers the Rasa Rakta Samvahan (aided by kapha and pitta dosha). In Charak Vimansthan 8 chapter-in Bahudosha Avastha, dosha should be eliminated by purification.*VIRECHAN* is indicated for pitta dosha and it is effective therapy for tridosha.ie Mala,Pitta,Kapha,Vata.[6] *Also in Astang Hridya, Mridu Sanshodhana is choice of management in Vata Vyadhi(Anuloman) is one among the variety of Mridu Sanshodhan ie mild laxative drug daily (without any strict regime of dietary and habits).* Virechana is less stressful procedure than Vamana Karma.Because it is popular and well tolerated, *Virechana* is often considered the optimal treatment for disorders arising from an increase or imbalance of ***Pitta Dosha***.[7]

The drug which digests the *Amadosha* of *Malas* & breaks their consolidation and after removing Stroto Vibandha, expels them out through *Adhobhaga* is known as *Anulomana*, like *Haritaki*. (Sharangadhar). It has *Deepana*, *Agnivardhana*, *Anulomana*, *Tridoshshamaka*, *Rasayana*, rejuvenating- *Bala*, *Buddhi* and *Indriya*

[3] Trikamji J, editor, (First edition). Commentary of Sri Dalhanacharya on Sushruta Samhita of Sushruta, Nidansthan; VataVyadhiNidanam Adhyayam: Adhyaya 01, Sutra 17. Varanasi: Chaukhamba Sanskrit Sansthan, Reprint 2017; 260

[4] Hypertension [Internet]. Who.int. 2020 [cited 16 April 2022]. Available from: https://www.who.int/health-topics/hypertension/#tab=tab_1

[5] Ghuraiya S, Mandal S, Clinical study to evaluate the efficacy of punarnava churna on vyana bala vaishamya (hypertension). International journal of ayurveda and pharma research. 2018;6(8).

[6] Shukla G, Bhatted SK, Dave AR, Shukla VD. Efficacy of Virechana and Basti Karma with Shamana therapy in the management of essential hypertension: A comparative study. Ayu. 2013 Jan;34(1):70-6. doi: 10.4103/0974-8520.115455. PMID: 24049408; PMCID: PMC3764884.

[7] *Sharma R, Dash B, editors. Sutra Sthana. 7th ed. Varanasi: Chowkhambha Sanskrit Series; 2002. Charaka Samhita Text with English Translation and Critical Exposition Based on Chakrapanidatta's Ayurveda Dipika; pp. 18–49.*

property. Cardio tonic[8] , Anti -oxidant[9], Hypotensive actions of Haritaki has been reported. It can be used in *Vyana Bala Vaishamya* (Hypertension) and the results can be interpreted accordingly. Vyana Bala Vaishamya (Hypertension) can be cured by considering vitiated Dosha, Dushya, Srotas, etiological factors, *Aahara* and *Vihara* vitiating *Tridoshaand Rakta* into consideration. Hence, we can disintegrate the pathogenesis of Hypertension with the help of combination therapy of *Sarpagandha vati* with *Anuloman Chikitsa* (*Haritaki Churna*) and manage hypertension in its primary stage therefore decreasing its prevalence rate.

AIM:

A comprehensive review of Vyana Bala Vaishamya as hypertension in Ayurveda.

OBJECTIVES:

1. To evaluate contemporary scholarly works and research on Vyana Bala Vaishamya, correlating it with the modern understanding of hypertension.
2. To explore and assess the therapeutic approaches and interventions within Ayurveda for managing Vyana Bala Vaishamya, or hypertension.

MATERIAL AND METHODOLOGY:

Classical medical texts such as Harrison's Principles of Internal Medicine and Davidson's Principles and Practice of Medicine provide explanations on hypertension. In contrast, foundational Ayurvedic texts—Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya—elucidate the location, functions, and imbalances (*Vikrita Karma*) and symptoms (*Lakshana*) associated with conditions like Vyana Bala Vaishamya. To develop a comprehensive understanding of this Ayurvedic concept of hypertension and evaluate the therapeutic effects of combining *Sarpagandha Vati* with *Anuloman Chikitsa* (*Haritaki Churna*), an extensive review of databases such as PubMed, Scopus, Dhara, Google Scholar, and other related research was conducted.

ELIGIBILITY CRITERIA:

Inclusion criteria:

- Patients of either sex with age between 18-50 years.
- Newly diagnosed stage1 Primary Hypertensive patients.

Exclusion criteria:

- Primary Hypertension other than Stage1 e.g. Stage 2, Benign Hypertension, Malignant Hypertension, Isolated Hypertension.
- Secondary Hypertension.
- Stage1, Primary Hypertensive patients on regular medications.
- Stage1, Primary Hypertension with co morbidities.
- Pregnant woman and lactating mother.
- Gestational hypertension

Withdrawal criteria:

- If patients develop any other acute illness during the trial period.
- Subject not willing to continue.
- The condition of patient deteriorates during trial.

A. **STUDY TYPE:** Interventional
B. **STUDY DESIGN:** Randomised clinical trial
C. **SAMPLE SIZE:** 90
D. **PROCESS OF RANDOMISATION**- Computer generated randomisation
E. **DRUGS USED:** *Sarpagandha Vati, Haritaki Churna.*
F. **PART USED:** *Phala (Dried Fruit)*
G. **DOSAGE:** 3grams *Haritaki Churna*, 250mg *Sarpagandha Vati*
H. **FORM OF MEDICINE:** *Churna, Vati*
I. **ROUTE OF ADMINISTRATION:** Oral

[8] Ayurvedic Pharmacopoeia of India
[9] DR.J.L.N.Sastry; DRAVYAGUNA VIJNANA Foreword by Prof K.C.Chunekar volume II; Chaukhambha Orientalia,Varanasi ;Reprint edition 2012, 213

J. **ANUPAAN:** Lukewarm water
K. **DURATION OF STUDY:** 12 months
L. **TRIAL DURATION:** 45 Days
M. **FOLLOW UP:** Every 15 days
N. **STUDY AREA**: OPD and IPD patients of Chaudhary Brahm Prakash Ayurved Charak Sansthan Khera Dabar, Najafgarh, New Delhi.
O. **STUDY POPULATION**: Clinically diagnosed patients of *Vyana Bala Vaishamya* (Hypertension) will be selected for the purpose of study.

DATA ANALYSIS:

Data collected was entered into Microsoft excel spreadsheet. Objective parameters were presented as mean and SD. Objective parameters were compared before and after therapy by performing paired t-test. Subjective parameters (symptoms) were presented in Frequency and Percentages. For comparison between Trial Group and Control Group, we have used Mann Whitney U Test. From above table we can observe that P-Values for almost parameters are less than 0.05. Hence, we conclude that there is significant difference between Trial Group and Control Group. Further we can observe that mean rank for Trial Group is greater than Control Group. Hence, we conclude that effect observed in Trial Group is more than Control Group.

Statistical software SPSS version 20.0 was used.

DETAIL OF TREATMENT ADMINISTRATION

Table No.1: Details of Treatment Administered:

Drug	*Sarpagandha Vati, Haritaki Churna*
Group A	*Sarpagandha vati with Anuloman Chikitsa (Haritaki churna)*
Group B	*Sarpagandha Vati*
Form of Medicine	*Churna, Vati*
Route administration of	Oral
Dose	3grams, 250mg (1 Tablet)
Anupana	Lukewarm water
Time administration of	Twice a day, *Churna* in night time only.
Duration	45days
Follow up	Every 15 days

PLANE OF STUDY:

Table No.2: Plan of Study

INTERVENTION	DAY0	DAY 15	DAY30	DAY45
Screening	✓			
Physical Examination	✓	✓	✓	✓
Blood pressure	✓	✓	✓	✓
Shirashoola(Headache)	✓	✓	✓	✓
Brhama (Giddiness)	✓	✓	✓	✓
Kshubdata (Irritability)	✓	✓	✓	✓
Shrama (Fatigue)	✓	✓	✓	✓
Anidra (Insomnia)	✓	✓	✓	✓
Administration of drug	✓	✓	✓	

ASSESSMENT CRITERIA:

DIAGNOSTIC ASSESSMENT CRITERIA:

Assessment of blood pressure will be done by measuring it with the help of sphygmomanometer.

OBJECTIVE CRITERIA:

Table No.3.7.1.1: Objective Criteria for Hypertension:

BLOOD PRESSURE CATEGORY	**SYSTOLIC mm hg**		**DIASTOLIC mm hg**
Normal	Less than 120	And	Less than 80
Elevated	120-129	And	Less than 80
Hypertension STAGE 1	130-139	Or	80-89
Hypertension STAGE 2	More than or equal to 140	Or	More than or equal to 90
Isolated systolic Hypertension	More than or equal to 140	And	Less than 90

ASSESSMENT:

Excellent Improvement	Reduction of B.P. from Stage I Hypertension to normotensive range
Marked Improvement	Reduction of B.P. from Stage I Hypertension to Pre – Hypertensive range
Mild Improvement	Some reduction in B.P. but still in Stage I Hypertension
No Improvement	No reduction in B.P.

SUBJECTIVE CRITERIA:

Grading method will be adopted for various subjective features (if present) like-

a) *Shirashoola* (Headache)
b) *Brhama* (Giddiness)
c) *Kshubdata* (Irritability)
d) *Shrama* (Fatigue)
e) Anidra (Insomnia)

OBSERVATION AND RESULT:

Statistical Analysis:

Ninety patients were enrolled in two groups ie group A (Trial group) and group B (Control group). Out of which 7 patients dropped out. Demographic data is displayed as frequency and percentage, accompanied by graphical representation. Variables on an ordinal scale were evaluated using the Wilcoxon Signed Rank W. The paired t-test is conducted for pre-post examination of quantitative data. A P-Value less than 0.05 is deemed significant, while a P-Value more than 0.05 is regarded as not significant.

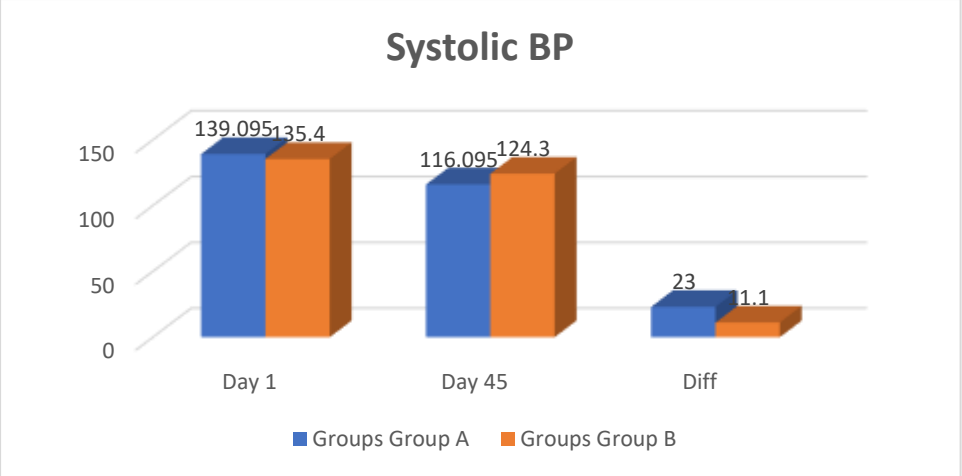
Statistical analysis is conducted with SPSS 27.0 program.

A) Changes in SBP (BT & AT) in Group A and Group B

Table: Shows decrease in SBP (mm of Hg) after treatment

Sr. No.	**Mean (SBP)**	**Groups**	
		Group A	**Group B**
1	Day 1	139.095	135.4
2	Day 45	116.095	124.3
3	Diff	23	11.1

Figure: Shows decrease in SBP (mm of Hg) after treatment



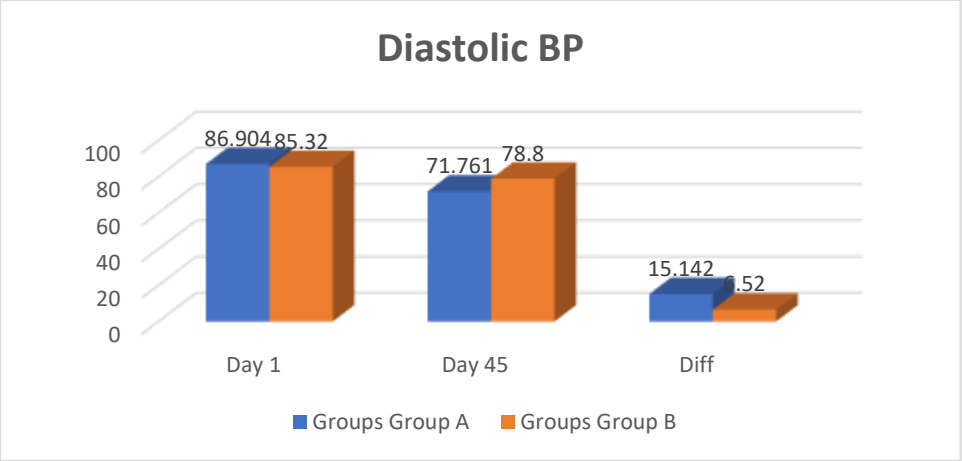
It was observed that average decrease in SBP is more in Group A than in Group B.

B) Changes in DBP (BT & AT) in Group A and Group B

Table: Shows decrease in DBP (mm of Hg) after treatment

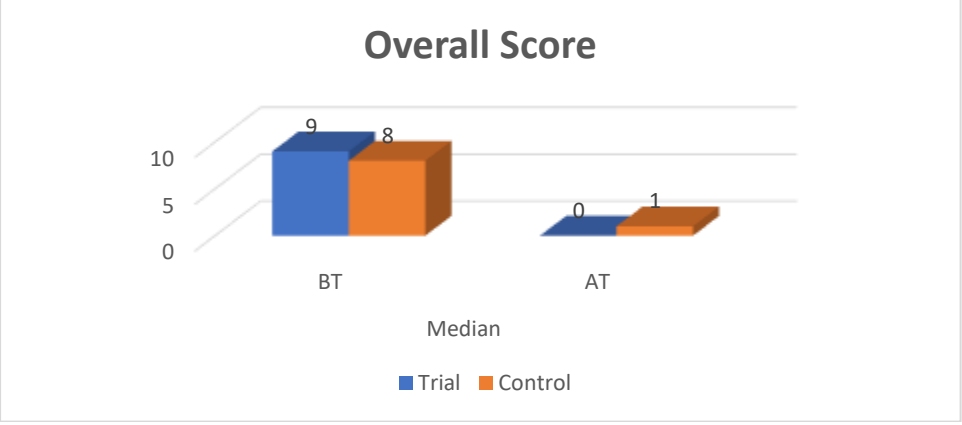
Sr. No.	Mean (DBP)	Groups	
		Group A	Group B
1	Day 1	86.904	85.32
2	Day 45	71.761	78.8
3	Diff	15.142	6.52

Figure: Shows decrease in DBP (mm of Hg) after treatment



It was observed that average decrease in DBP is more in Group A than in Group B.

Effect of therapy on Overall score.



Overall score	Median		Wilcoxon Signed Rank W	P-Value	Result
	BT	AT			
Trial	9	0	5.645	0	Sig.
Control	8	1	5.578	0	Sig.

Since observations are on ordinals scale (gradations), we have used Wilcoxon Signed Rank Test to test efficacy in Trial Group and Control Group. From above table we can observe that P-Values for Trial Group and Control Group are less than 0.05. Hence, we conclude that effect observed in both groups are significant.

Comparison between Trial Group and Control Group

	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	P-Value
Shirashoola	Trial	42	40.378	1494	791	0.92
	Control	41	32.4	1134		
Brhama	Trial	42	35.594	1317	614	0.038
	Control	41	32.033	961		
Kshubdata	Trial	42	31.161	1059.5	464.5	0.000
	Control	41	29.634	770.5		
Shrama	Trial	42	40.214	1689	684	0.209
	Control	41	29.285	1025		
Anidra	Trial	42	44.722	1610	944	0.002
	Control	41	29.486	1091		
Total Overall Score	Trial	42	52.13	2189.5	1815	0.001
	Control	41	29.294	768		

For comparison between Trial Group and Control Group, we have used Mann Whitney U Test. From above table we can observe that P-Values for almost parameters are less than 0.05. Hence, we conclude that there is significant difference between Trial Group and Control Group. Further we can observe that mean rank for Trial Group is greater than Control Group. Hence, we conclude that effect observed in Trial Group is more than Control Group.

DISCUSSION:

In this study a total of 90 patients suffering from *Vyana Bala Vaishamya* (Hypertension) were enrolled from OPD/IPD of Chaudhary Brahm Ayurved Charak Sansthan situated New Delhi. They were enrolled using computer generated randomization and 7 out of 90 patients dropped out from the study. A detailed proforma was made according to the disease including objective and subjective criteria which was them assessed statistically and discussed as follows

Plan of study

After thorough history and examination, the diagnosis was confirmed and the subjects who were willing for the trial and fulfilling the inclusive criteria were selected for this study.

Ninety (90) subjects were taken for the study and randomly divided into two groups of 45 each.

- **Trial Group-A:** In this group, 42 subjects of *Vyana Bala Vaishamya* (~hypertension). They are advised for regular combination therapy of *Sarpagandha Vati* with *Anuloman Chikitsa (Haritaki Churna).*
- **Control Group-B:** In this group, 41 subjects of *Vyana Bala Vaishamya* (~hypertension). they are advised for *Sarpagandha Vati*
- Follow-up were taken on 15^{th}, 30^{th} & 45^{th} day.

Discussion on Results:

Age: Most patients in the 46-50year age group having Vyana Bala Vaishamya suggests that this condition is more common in older age. This is likely because Vata dosha naturally becomes more dominant in old age (*Vriddha-avastha*), increasing vulnerability to imbalances like *Vyana Bala Vaishamya.*

Gender:.Because the study involved only a small number of participants, it is difficult to make definitive statements about the influence of gender on the frequency of *Vyana Bala Vaishamya.*

Religion: Religion doesn't appear to influence how Vyana Bala Vaishamya (hypertension) develops. The reason a particular religious group seems more affected is likely because they make up a larger portion of the population living near CBPACS Hospital.

Education: There appears to be no correlation between educational qualification and the occurrence of Vyana Bala Vaishamya (hypertension).

Socioeconomically Status: The impact of socio-economic class on the prevalence of Vyana Bala Vaishamya (hypertension) remains uncertain.

Family H/O HTN: People who have one or more family members diagnosed with hypertension before age 60 face a significantly higher risk of developing it themselves. If three or more relatives exhibit raised blood pressure under 60, that indicates a strong hereditary predisposition. While a family history doesn't make hypertension inevitable, it meaningfully increases the likelihood. Research has shown that having a positive family history is a demonstrable risk factor for hypertension as well as related cardiovascular diseases and strokes.

Type of Diet: The specific impact of diet on the development of Vyana Bala Vaishamya (hypertension) remains unclear, as existing studies do not fully explain how various dietary elements contribute to its pathogenesis.

Pradhan ras sevan: A diet high in **Lavana Rasa** (salty taste) tends to increase the body's Kleda—due to its dominance of Jala Mahābhūta (water element)—which in turn raises the volume of Rakta (blood). This forces Vyana Vayu to circulate with greater effort. In biomedical terms, consuming more than about **2 grams of sodium per day** (or over **5 grams of salt**) has been shown to elevate blood pressure and increase risks of heart disease and stroke.

Personal history - vihara: Regular exercise can produce physiologic hypertrophy, which is generally beneficial and differs from the harmful hypertrophy caused by long-term mechanical stress. Endurance or aerobic activities (for example, long-distance running) lead to an increase in heart chamber volume (eccentric hypertrophy) and better capillary networks. These changes tend to lower resting heart rate and blood pressure.

Nidra: In Ayurveda, elevated Vata is linked to disturbances in sleep, such as frequent awakenings and daytime drowsiness. This concept aligns with modern research indicating that insomnia, particularly when associated with physiological hyperarousal, significantly increases the risk of developing hypertension.

Addiction: Tea has become a staple in modern life and is generally not considered an addiction. However, excessive consumption of coffee and nicotine may act as contributing factors to hypertension in susceptible individuals.

In Ayurveda, substances with qualities such as *Vyavayi*, *Vikasi*, *Ushna*, and *Tikshna* are considered toxins that can vitiate *Rakta Dhatu*.

Tobacco, with its *Ushna* and *Tikshna* properties, is one such substance that can disrupt the balance of *Rakta Dhatu*. Similarly, alcohol is known to vitiate both *Rakta* and *Pitta doshas*, contributing to hypertension.

Emotional Status: Vyana Bala Vaishamya, or hypertension, is primarily characterized by an imbalance in the Vata dosha. According to Acharya Charaka, the primary causes (Nidana) of Vata disorders include *Krodha* (anger), *Shoka* (grief), *Chinta* (anxiety), and *Bhaya* (fear). These psychological factors are known to aggravate the Vata dosha, leading to various health issues.

Occupation - Nature: A study published in the Journal of the American College of Cardiology found that prolonged sitting increases the risk of heart disease, even for those who engage in regular exercise after work. Experts emphasize the importance of regular movement to counteract these risks. Simple actions like standing up every 20 minutes, walking around the house, or using tools like treadmill desks and hand weights can help raise heart rate and promote circulation.

BMI: In Ayurveda, Sthaulya is considered a *Santarpanajanya Vyadhi*—a disease resulting from excessive intake and accumulation of nutrients. This condition is primarily attributed to the vitiation of Medodhatu and Kapha dosha, often due to factors like overeating, consumption of heavy and unctuous foods, and a sedentary lifestyle. These imbalances lead to Agnimandya, causing the formation of Ama.

Prakriti - sharirik: Indeed, Vyana Bala Vaishamya (hypertension) is primarily characterized by a predominance of Vata and Pitta doshas, making it a Vata-Pitta Pradhan Tridoshaja Vyadhi. However, individuals with Vata-Pitta, Pitta-Kapha, or Vata-Kapha constitutions (Prakritis) can also be susceptible to developing hypertension due to the unique doshic imbalances associated with each constitution.

Prakriti - Mansik: In this study, the majority of patients diagnosed with Vyana Bala Vaishamya (hypertension) exhibited a **Rajasik Prakriti**, characterized by an excess of the **Rajas** quality—manifesting as activity, restlessness, and mental agitation. According to Ayurvedic principles, individuals with a **Rajasik Prakriti** are predisposed to imbalances in the **Vata** and **Pitta** doshas. These doshas play a significant role in the pathogenesis of hypertension.

Dashavidha pariksha – Satmya: The **DASH (Dietary Approaches to Stop Hypertension) diet**, which emphasizes high intake of potassium, magnesium, and low sodium, has been shown to lower blood pressure. Research indicates that greater adherence to the DASH diet is associated with more favorable systolic and diastolic blood pressure values compared to those with low adherence.

Vaya: The observed prevalence of hypertension in this study aligns with established medical knowledge, where age is a significant risk factor. As individuals age, the risk of developing hypertension increases due to various physiological changes.

DISCUSSION ON OBJECTIVE PARAMETERS:

- **SYSTOLIC BLOOD PRESSURE:**

Since observations were quantitative, we used Paired t- Test to test efficacy. It was seen that P-Value was 0.0001. As, P-Value is less than 0.05, so it can be concluded that, there is significant change observed in Systolic BP.

Mean Systolic blood pressure before treatment:139.095 in group A and 135.4 in group B.

Mean Systolic blood pressure after treatment: 116.095 in Group A and 124.3 in group B.

Difference change in systolic blood pressure is 23 in group A and 11.1 in group B.

- **DIASTOLIC BLOOD PRESSURE:**

Since observations were quantitative, we used Paired t- Test to test efficacy. It was seen that P-Value was 0.0001. As P-Value is less than 0.05, so it can be concluded that, there is significant change observed in Diastolic BP.

Mean Diastolic blood pressure before treatment: 86.904 in group A and 85.32 in group B.

Mean Diastolic blood pressure after treatment: 71.76 in group A and 78.8 in group B. Difference change in diastolic blood pressure is 15.142 in group A and 6.52 in group B

DISCUSSION ON SUBJECTIVE PARAMETERS:

In this study as all the objective parameters were on ordinal scale (gradations) so Wilcoxon Signed Rank Test was used to check the efficacy.

- ***SHIRASHOOLA* (Headache):**

It was found that P-Value was 0.00. As P-Value is less than 0.05, so it can be concluded that, there is significant effect observed in *Shirashoola.*

- **BRHAMA (Giddiness):**

It was found that P-Value was 0.00. As P-Value is less than 0.05, so it can be concluded that, there is significant effect observed in *Brhama. Brahma*, characterized by giddiness or vertigo, is primarily attributed to imbalances in the *Vata* dosha and is classified under *Pittaja Shiroroga* (Pitta-related head disorders), *Pittaja Hridroga* (Pitta-related heart disorders), and *Rakta Pradoshaja Vikara*.

- ***KSHUBDATA* (Irritability):**

It was found that P-Value was 0.00. As P-Value is less than 0.05, so it can be concluded that, there is significant effect observed in *Kshubdata.Kshubdata,* also referred to as *Krodha Prachurata,* signifies a state of mental agitation or heightened irritability. In Ayurved, this condition *Samprapti* is categorized under *Rakta Pradoshaja Vikaras*, disorders arising from the vitiation of blood.

- ***SHRAMA* (Fatigue):**

It was found that P-Value was 0.00. As P-Value is less than 0.05, so it can be concluded that, there is significant effect observed in *Shrama. Shrama* refers to both physical and mental fatigue. While *Shrama* encompasses physical exhaustion, Glani specifically denotes mental tiredness or lack of desire for physical work.The primary dosha responsible for Shrama is ***Vata***, which governs movement, circulation, and the nervous system. When Vata is aggravated, it can lead to symptoms such as restlessness, anxiety, and instability, contributing to both physical and mental exhaustion.

- ***ANIDRA* (Insomnia):**

It was found that P-Value was 0.00. As P-Value is less than 0.05, so it can be concluded that, there is significant effect observed in *Anidra. Anidra* is mainly due to vitiated *Vata* and *Pitta.*

Overall effect of therapy

Since observations are on ordinals scale (gradations), we have used Wilcoxon Signed Rank Test to test efficacy in Trial Group and Control Group. we can observe that P-Values for Trial Group and Control Group are less than 0.05. Hence, we conclude that effect observed in both groups are significant.

For comparison between Trial Group and Control Group, we have used Mann Whitney U Test. From above table we can observe that P-Values for almost parameters are less than 0.05. Hence, we conclude that there is significant difference between Trial Group and Control Group.

Further we can observe that mean rank for Trial Group is greater than Control Group. Hence, we conclude that effect observed in Trial Group is more than Control Group.

P- Value for the *Sharma* and *Shira shoola* were than 0.05, hence it is concluded that effect in both the group are not significant for these two objective criteria.

There was average change of 23[16.54%] and 11.1[8.19] in SBP in Group A and Group B respectively.

There was average change of 15.14[17.42%] and 6.52[7.64] in DBP in Group A and Group B respectively.

P- Value for the *Sharma* and *Shira shoola* were than 0.05, hence it is concluded that effect in both the group are not significant for these two objective criteria.

Probable Mode of Action of *Haritaki Churna*:[10],[11]

Sanskrit Term	Relevance in Hypertension
(Vāta-Pitta Śhamaka)	Helps balance *Vyana Vata* and *Pitta*, which are key in BP elevation
(Rasāyana)	Enhances *Ojas*, strengthens heart and blood vessels

[10] Ayurvedic Pharmacopoeia of India

[11] Suchalatha S, Shyamadevi CS. Protective effect of Terminalia chebula against experimental myocardial injury induced by isoproterenol. Indian J Exp Biol.2004;42(2):174–178.

Sanskrit Term	Relevance in Hypertension
(Srotoś́odhana)	Clears *Rakta Vaha Srotas*, improves blood flow
(Medohara)	Reduces *Medo Dhatu*, helps manage obesity-related hypertension
(Hṛdaya Hita)	Supports heart function and reduces cardiac strain
(Anulomaka)	Relieves *Apana Vata blockage*, reduces systemic pressure buildup
(Dīpana)	Enhances *Agni*, reduces *Ama*
(Mānasika Balya)	Reduces mental stress, a major cause of high BP

Antioxidant[12]Activity:

Haritaki is rich in polyphenols and tannins, which exhibit strong antioxidant properties. These antioxidants help reduce oxidative stress—a major contributor to endothelial dysfunction and hypertension—by neutralizing free radicals and protecting blood vessels.

- **Improvement of Endothelial Function[13]:**

By reducing oxidative damage, Haritaki may help improve the function of the endothelium (the inner lining of blood vessels). Better endothelial health leads to improved vasodilation and blood flow, which can lower blood pressure.

- **Mild Diuretic Effect[14]:**

Haritaki may promote mild diuresis (increased urine output), helping the body eliminate excess sodium and water. This reduction in blood volume can contribute to lowering blood pressure.

- **Anti-inflammatory Properties[15]:**

Chronic inflammation is linked with hypertension. *Haritaki's* anti-inflammatory effects can reduce vascular inflammation, thereby helping maintain healthy blood vessels and normal pressure levels.

- **Lipid-Lowering Effects[16]:**

Haritaki may also help reduce cholesterol and triglyceride levels, contributing indirectly to cardiovascular health and reducing the risk factors associated with hypertension.

- **Stress Reduction and Nervous System Modulation[17]:**

Haritaki as balancing for the nervous system, potentially reducing stress and anxiety, which are common triggers for elevated blood pressure.

PROBABLE MODE OF ACTION OF SARPAGANDHA VATI:[18]

Vasodilation: Sarpagandha Vati, an Ayurvedic formulation containing *Rauwolfia serpentina* (Sarpagandha), is known for its ability to lower high blood pressure partly through its vasodilatory effect. The key active alkaloid, **reserpine**, depletes certain neurotransmitters such as norepinephrine from nerve endings, which decreases sympathetic nervous system activity. This leads to relaxation of the smooth muscle in the blood vessel walls, causing them to dilate.

[12] Shrivastav, D., Dabla, P. K., Sharma, J., Viswas, A., & Mir, R. (2024). Natural product-based treatment potential for type 2 diabetes mellitus and cardiovascular disease: A systematic review of randomized controlled trials. *World Journal of Diabetes, 14*(6), 919–929.

[13] Pingali, U., Sukumaran, D., & Nutalapati, C. (2020). Effect of an aqueous extract of Terminalia chebula on endothelial dysfunction, systemic inflammation, and lipid profile in type 2 diabetes mellitus: A randomized double-blind, placebo-controlled clinical study. *Phytotherapy Research, 34*(12), 3226–3235.

[14] Ishtiaq, M. (2007). An ethnomedicinal survey and documentation of important plants of Samahni valley, Azad Jammu and Kashmir, Pakistan. *Journal of Ethnopharmacology, 113*(2), 387–396.

[15] Shrivastav, D., Dabla, P. K., Sharma, J., Viswas, A., & Mir, R. (2024). Natural product-based treatment potential for type 2 diabetes mellitus and cardiovascular disease: A systematic review of randomized controlled trials. *World Journal of Diabetes, 14*(6), 919–929.

[16] Thakur, C. P., Thakur, B., Singh, S., Sinha, P. K., & Sinha, S. K. (1988). The Ayurvedic medicines Haritaki, Amala and Bahira reduce cholesterol-induced atherosclerosis in rabbits. *International Journal of Cardiology, 21*(2), 167–175.

[17] Sandhu, J. S., & Arora, R. (2010). Effects of Withania somnifera (Ashwagandha) and Terminalia arjuna (Arjuna) on physical performance and cardiorespiratory endurance in healthy young adults. *Journal of Ayurveda and Integrative Medicine, 1*(3), 144–149.

[18] . Pandey VP, Cherian E, Patani G, Effect of growth regulators and culture conditions on direct root induction of Rauvolfia serpentina L. (Apocynaceae) Benth. by leaf explants. Tropical Journal of Pharmaceutical Research, 9(1), 2010, 27-34.

By reducing peripheral vascular resistance through vasodilation, Sarpagandha Vati helps alleviate the workload on the heart and lowers blood pressure, making it an effective natural remedy for hypertension.[19]

It is suggested that the active compounds in Rauwolfia can reduce total cholesterol, low-density lipoprotein (LDL), and triglycerides while sometimes improving high-density lipoprotein (HDL) levels. The exact mechanism is not fully understood but is believed to involve.[20]

CONCLUSION:

- It is therefore evident from this clinical study that *Vyana Bala Vaishamya* corresponds closely with the Ayurvedic understanding of hypertension, particularly in cases where *Vata* and *Pitta* doshas predominate. Hypertension, as a lifestyle disease heavily influenced by stress, manifests in symptoms that Ayurvedic doctrine attributes to an imbalance in *Vyana Vāyu*.
- This study demonstrates that hypertension (Vyana Bala Vaishamya) is strongly affected by factors such as age, family history, physical activity level, sleep patterns, and overall lifestyle.
- The administration of *Sarpagandha Vati* combined with *Haritaki Churna* shows marked effectiveness in managing *Vyana Bala Vaishamya* (hypertension), particularly when accompanied by appropriate dietary and lifestyle modifications.
- This trial found that most patients experienced improvement in symptoms, with both systolic and diastolic blood pressure falling — the reduction in systolic pressure being especially pronounced.
- The use of *Sarpagandha Vati* with *Haritaki Churna* was found to considerably alleviate mental health symptoms, including headaches and insomnia, highlighting its potential as a treatment for hypertension associated with stress.

[19] Jana S, Shekhawat GS. Anethum graveolens: An Indian traditional medicinal herb and spice. Pharmacogn Rev. 2010 Jul;4(8):179-84. doi: 10.4103/0973-7847.70915. PMID: 22228959; PMCID: PMC3249919.

[20] Azmi MB, Sultana S, Naeem S, Qureshi SA. *In silico* investigation on alkaloids of *Rauwolfia serpentina* as potential inhibitors of 3-hydroxy-3-methyl-glutaryl-CoA reductase. Saudi J Biol Sci. 2021 Jan;28(1):731-737. doi: 10.1016/j.sjbs.2020.10.066. Epub 2020 Nov 5. PMID: 33424361; PMCID: PMC7783793.