Research article

A Pilot Study to Evaluate the Immediate Effect of Shamak Yoga, A Polyherbal Ayurvedic Formulation, on Blood Pressure in Patients with Essential Hypertension

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Abstract –

Background*: Essential hypertension is a leading risk factor for cardiovascular diseases. Safe, short-acting interventions are often needed to manage elevated blood pressure in acute settings or before procedures such as Panchakarma in Ayurveda.*
Objective*: To evaluate the short-term antihypertensive effect of a single dose of Shamak Yoga, a polyherbal Ayurvedic formulation, in patients with stage 1 or stage 2 essential hypertension.*
Methods*: A single-arm, open-label, prospective pilot study was conducted at Shri Ayurved Mahavidyalaya, Nagpur. Thirteen patients with essential hypertension (stages 1 or 2), not on*

any antihypertensive therapy, received a single oral dose of 2 grams of Shamak Yoga with lukewarm water. Blood pressure readings were recorded at baseline and at 30-, 60-, and 90-minute post-administration.

***Results**: Mean systolic blood pressure (SBP) dropped by 9.23 mmHg (6.25%) and mean diastolic blood pressure (DBP) dropped by 7.69 mmHg (8.12%) within 90 minutes. No adverse effects were reported.*

***Conclusion**: Shamak Yoga demonstrated a modest but consistent short-term reduction in blood pressure. Larger, placebo-controlled, randomized studies are needed to validate these findings.*

***Keywords**: Ayurveda, Essential Hypertension, Shamak Yoga, Blood Pressure, Pilot Study*

1. Introduction

Hypertension (HTN), or high blood pressure (HBP), is a chronic medical condition characterized by persistently elevated pressure in the arterial system. It is broadly classified into two categories: primary (essential) hypertension, which accounts for approximately 90–95% of cases and has no identifiable medical cause, and secondary hypertension, which constitutes the remaining 5–10% of cases and is attributed to underlying conditions affecting the kidneys, arteries, heart, or endocrine system [1,2].

According to the American College of Cardiology/American Heart Association (ACC/AHA) guidelines, hypertension is further subclassified into Stage 1 and Stage 2:

- *Stage 1 hypertension*: Systolic Blood Pressure (SBP) of 130–139 mmHg or Diastolic Blood Pressure (DBP) of 80–89 mmHg
- *Stage 2 hypertension*: SBP ≥140 mmHg or DBP ≥90 mmHg [3,4]

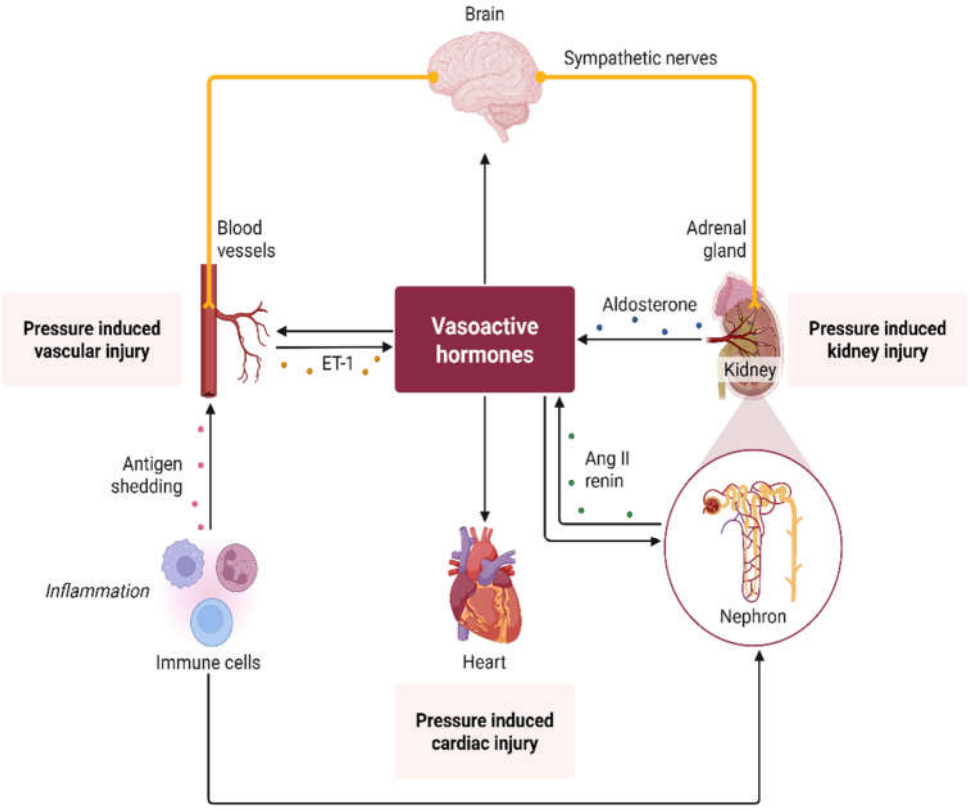


Figure 1: Pathophysiology of Hypertension

Hypertension is a leading component of the global burden of non-communicable diseases and remains one of the primary contributors to cardiovascular morbidity and mortality worldwide [5]. It affects less than 10% of individuals under the age of 34, but its prevalence rises steeply with age, impacting more than 50% of adults over 65 years [6]. In 2001, high blood pressure was estimated to be responsible for 7.6 million premature deaths and 92 million disability-adjusted life years (DALYs) globally [7].

Historically, cardiovascular diseases were primarily managed using plant-derived medications until the widespread adoption of modern pharmacotherapy around the 1940s. Despite the progress in antihypertensive treatment, current pharmacological options are associated with adverse effects, and a definitive cure remains elusive. This underscores the need to explore safe, effective, and accessible complementary therapies, including those based on traditional medicine systems.

Several natural health products have been identified with potential blood pressure-lowering properties [8]. When combined with lifestyle modifications, such as diet, exercise, and stress

management, these natural approaches may contribute to meaningful reductions in blood pressure, particularly in cases of essential hypertension [9].

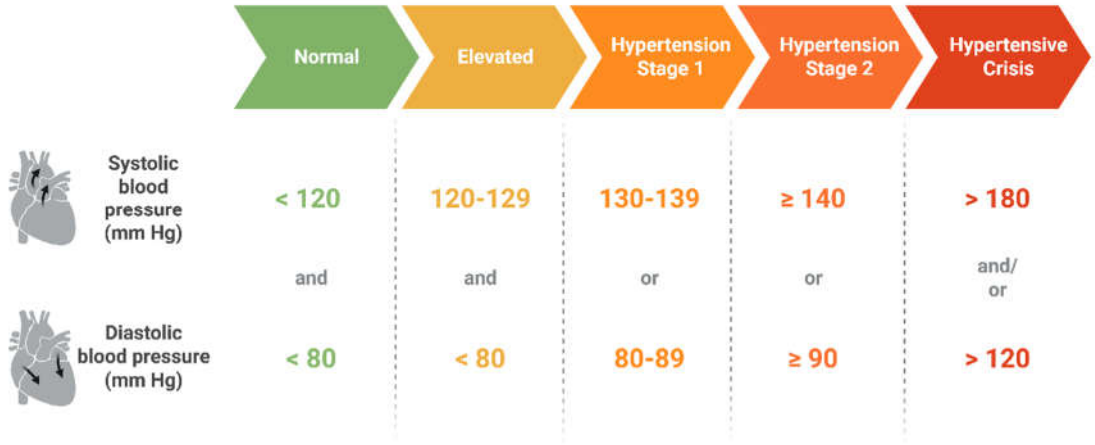


Figure 2: Hypertension Categories

Moreover, maintaining normotension is particularly important in patients undergoing Ayurvedic Panchakarma procedures, which include treatments such as Abhyanga (massage), Swedana (steam therapy), and invasive interventions like Basti (medicated enema), Nasya (nasal therapy), and Raktamokshana (bloodletting). Performing these procedures on hypertensive patients without stabilizing blood pressure can increase the risk of complications. Therefore, interventions that can rapidly normalize BP in such settings are valuable.

In this context, the current study was conducted among patients undergoing procedures like Panchakarma therapy, and physiotherapy with the aim of evaluating the short-term antihypertensive effect of a single dose of Shamak Yoga, a polyherbal Ayurvedic formulation. Shamak Yoga contains powdered forms of herbs used in Ayurvedic medicine for their calming and hypotensive effects. These include:

- Root of Acorus calamus (Vacha)
- Root of Hedychium spicatum (Shati)
- Root of Valeriana wallichii (Tagar)
- Root of Withania somnifera (Ashwagandha)
- Root of Nardostachys jatamansi (Jatamansi)
- Root of Cyperus rotundus (Musta)
- Fruit of Elettaria cardamomum (Ela)
- Panchang (bark, leaves, flowers, fruit, and root) of Bacopa monnieri (Brahmi)

- Panchang (bark, leaves, flowers, fruit, and root) of Convolvulus pluricaulis (Shankhapushpi)

The formulation was administered to temporarily reduce elevated blood pressure and enable safe continuation of the Ayurvedic procedures.

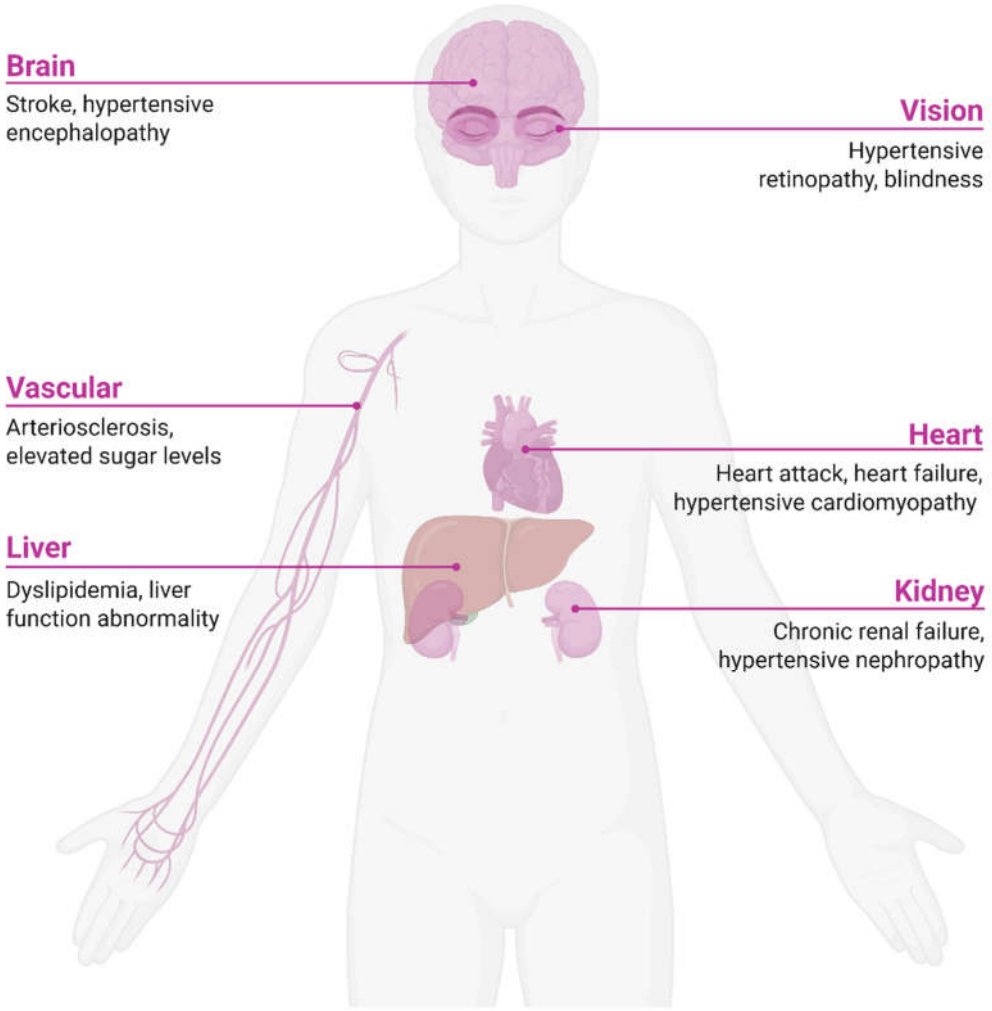


Figure 3: Hypertension Associated Comorbidities

2. Material and Methods

Study Design and Setting

This was a single-centre, open-label, prospective pilot study conducted at Shri Ayurved Mahavidyalaya, Nagpur.

Participants

Thirteen patients diagnosed with stage 1 or stage 2 essential hypertension (based on JNC 7 classification) [10] were enrolled. Inclusion criteria included:

- Age 18–75 years
- Diagnosed with essential hypertension
- Not currently taking antihypertensive medications

Exclusion criteria included:

- Secondary or malignant hypertension
- Pregnancy
- Known cardiovascular or renal complications
- Use of antihypertensive or psychoactive medications

All participants provided informed consent.

Intervention

Each participant received a single dose of 2 grams of Shamak Yoga with lukewarm water, taken orally.

Blood Pressure Measurement

BP was measured using a calibrated aneroid sphygmomanometer in the right arm, with patients in a supine position. Readings were taken at baseline (after 5 minutes of rest), 30, 60, and 90 minutes post-administration. Measurements were recorded by the same trained practitioner to minimize inter-observer variability. To determine systolic and diastolic blood pressure the Korotkoff sound I and V was used.[11] SBP, DBP, and mean BP (MBP) were recorded at each interval. MBP was calculated as

$$\text{Mean BP} = \frac{P1+P2+P3+P4+P5+P6+P7+P8+P9+P10+P11+P12.+P13}{13}.$$

p – BP reading of the patient

3. Observation and Results

A study on 13 patients was performed as follows: -

Sr No.	Name of Patient	Age and Sex	Diagnosis	BP Mean (mmHg)	1st Reading (mmHg)	2nd Reading (mmHg)	3rd Reading (mmHg)
1	J. K.	62 yr./F	Dakshin pakshaghata with HTN	150/90	150/80	150/80	150/80
2	M. M.	39 yr. /F	Manyakatigata vata with HTN	140/100	140/90	130/90	130/90
3	M. A.	50 yr. / F	Aamvata with HTN	170/90	160/90	160/90	160/80

4	R. N.	70 yr. / M	Sandhigata vata with HTN	140/80	140/80	130/80	130/80
5	S. K.	64 yr./F	Dakshina pakshaghata with HTN	150/90	150/80	150/80	140/80
6	C. B.	67 yr. / M	Manyakatigata vata with HTN	140/90	140/90	130/80	130/80
7	A. G.	62 yr. / F	Sandhigata vata with HTN	150/90	150/90	140/90	140/90
8	V. B.	58 yr./M	Dakshina pakshaghata with HTN	140/90	140/90	130/90	130/80
9	R. G.	65 yr./M	Katigraha with HTN	140/100	140/100	140/90	130/80
10	B. K.	65 yr./F	Aamvata with HTN	140/90	140/90	130/90	130/90
11	N. D.	65 yr./M	Upstambhita vatavydhi with sthoulya with HTN	160/100	160/100	150/90	150/80
12	S. P.	70 yr./M	Vaama pakshaghata with hridroga with marmaghata with HTN	160/90	160/90	150/90	150/90
13	S. B.	65 yr. / F	Nirupastambhita vatavyadhi with HTN	150/90	150/90	140/90	140/90

4. Demographic and Clinical Characteristics

The study included 13 patients (7 females, 6 males) with a mean age of 61 years. Associated conditions included stroke, osteoarthritis, and Vata vyadhi, but all were stable and not on antihypertensives.

Blood Pressure Response

- Mean SBP decreased from 148.5 mmHg to 139.3 mmHg (↓9.23 mmHg; 6.25%)
- Mean DBP decreased from 91.3 mmHg to 83.6 mmHg (↓7.69 mmHg; 8.12%)

Twelve patients showed SBP reductions, and nine patients had reductions in DBP. No adverse effects were reported.

Variability

The standard deviation of SBP reduction was 2.77 mmHg and that of DBP was 7.25 mmHg, suggesting greater inter-patient variability in DBP response.

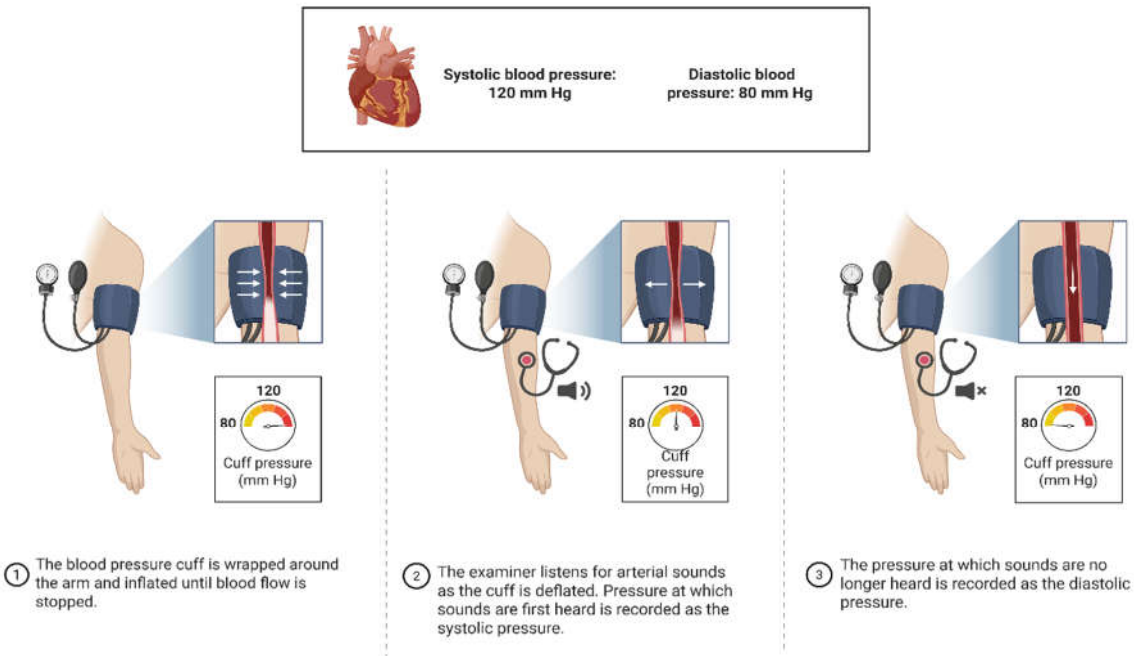


Figure 3: Measurement of Blood Pressure: The Auscultatory Method

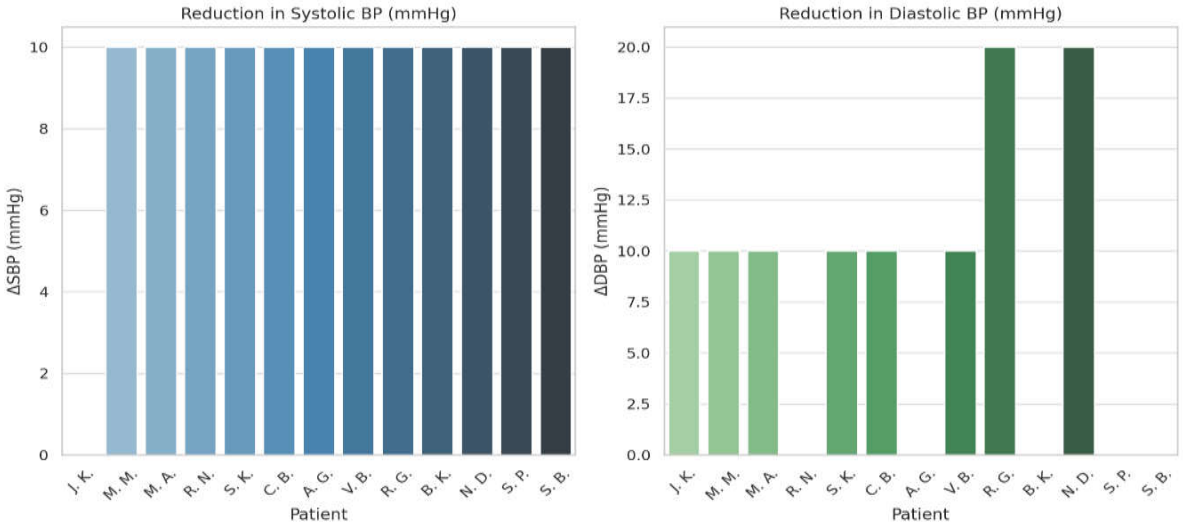
5. Statistical Analysis

Changes in SBP and DBP were analysed using descriptive statistics. Mean changes and percentage reductions from baseline were calculated. Due to the small sample size, formal hypothesis testing was not performed.

Statistical analysis based on the data from 13 patients treated with *Shamak Yoga*:

Summary of Blood Pressure Changes

Metric	Value
Mean SBP Drop	9.23 mmHg
Mean DBP Drop	7.69 mmHg
Mean % SBP Reduction	6.25%
Mean % DBP Reduction	8.12%
Standard Deviation (SBP)	2.77 mmHg
Standard Deviation (DBP)	7.25 mmHg



Graphs: Reduction in Blood Pressure

- The **left graph** shows the systolic BP reduction for each patient.
- The **right graph** shows the diastolic BP reduction for each patient.

These visualizations highlight the consistent drop in SBP across nearly all patients, with more variability in DBP response.

Here is the table showing individual patient data along with **percentage changes** in systolic and diastolic blood pressure after administering *Shamak Yoga*:

Table 1: Blood Pressure Changes per Patient

Patient	Initial SBP	Final SBP	ΔSBP (mmHg)	% SBP ↓	Initial DBP	Final DBP	ΔDBP (mmHg)	% DBP ↓
J. K.	150	150	0	0.00%	90	80	10	11.11%
M. M.	140	130	10	7.14%	100	90	10	10.00%
M. A.	170	160	10	5.88%	90	80	10	11.11%
R. N.	140	130	10	7.14%	80	80	0	0.00%
S. K.	150	140	10	6.67%	90	80	10	11.11%
C. B.	140	130	10	7.14%	90	80	10	11.11%
A. G.	150	140	10	6.67%	90	90	0	0.00%
V. B.	140	130	10	7.14%	90	80	10	11.11%
R. G.	140	130	10	7.14%	100	80	20	20.00%
B. K.	140	130	10	7.14%	90	90	0	0.00%
N. D.	160	150	10	6.25%	100	80	20	20.00%
S. P.	160	150	10	6.25%	90	90	0	0.00%
S. B.	150	140	10	6.67%	90	90	0	0.00%

Discussion

The average systolic blood pressure decreased by 9.23 mmHg with standard deviation of 2.77 mmHg, and diastolic blood pressure decreased by 7.69 mmHg with standard deviation of 7.25 mmHg after administration of *Shamak Yoga*. This corresponds to a 6.25% reduction in SBP and an 8.12% reduction in DBP, indicating a clinically relevant short-term antihypertensive effect.

The variability in DBP response (as shown by a higher standard deviation) suggests that individual responses to the formulation may differ, which should be explored further in larger trials.

Previous studies have demonstrated the effectiveness of *Shamak Yoga* in managing stage 1 essential hypertension.[12] According to Ayurvedic principles, the *Samprapti* (pathogenesis) of hypertension primarily involves the vitiation of *Vata Dosha*, often accompanied by *Kapha* and *Pitta* involvement. The constituent drugs of *Shamak Yoga* possess *Katu*, *Tikta*, *Kashaya*, and *Madhura Rasa*; *Laghu*, *Tikshna*, and *Snigdha Guna*; *Ushna* and some *Sheeta Veerya*; with *Katu* and *Madhura Vipaka*. These properties predominantly pacify *Vata*, while also addressing *Kapha* and *Pitta* imbalances. [13]

While earlier studies reported the clinical and statistical efficacy of *Shamak Yoga* where BP readings were recorded over a period of one week [14,15,16], the current pilot study observed a noticeable effect within just one hour of administration. Although the immediate results

appear modest, they are significant given the limited sample size. Expanding the study to include a larger population could potentially yield more robust and generalizable outcomes. The lack of a control group, randomization, and blinding limits the internal validity of this study. Additionally, the sample size (n=13) is insufficient for generalizable conclusions.

Conclusion

This pilot study evaluated the immediate effects of Shamak Yoga—a polyherbal Ayurvedic formulation—on patients with stage 1 and stage 2 essential hypertension. Administering a single 2-gram dose of Shamak Yoga resulted in a mean systolic blood pressure (SBP) reduction of 9.23 mmHg (approximately 6.25%) and a mean diastolic blood pressure (DBP) reduction of 7.69 mmHg (approximately 8.12%) within 90 minutes. Notably, 12 out of 13 patients experienced a decrease in SBP of 10 mmHg. While reduction in DBP was observed by 10 mmHg in 7 patients and 20 mmHg in 2 patients. No adverse effects were reported during the study period, indicating the formulation's safety for short-term use.

These findings of this pilot study suggest that Shamak Yoga may offer a modest, rapid-acting, natural intervention for managing elevated blood pressure, particularly beneficial for patients undergoing procedures like Panchakarma, where maintaining normotension is crucial. The observed antihypertensive effects align with Ayurvedic principles, wherein the formulation's constituents are believed to pacify Vata dosha, a key factor in the pathogenesis of hypertension.

However, the study's limitations—including its small sample size, lack of a control group, and short follow-up duration—necessitate caution in interpreting the results. To substantiate these preliminary findings, larger scale, randomized controlled trials with appropriate blinding and placebo control are essential to validate these outcomes.

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