

A clinical study on the effect of *Triphaladi Kala Basti* with *Arjuna Punarnavadi Ghanavati* in the management of essential hypertension

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Abstract

Introduction: Hypertension, one of the grave conditions, accounts for 6% of deaths worldwide. In 2010 increased blood pressure was the cause of an estimated 9.4 million deaths. According to Ayurveda, systemic arterial hypertension can be considered as *Tridoshaja* condition with predominance of *Vata* and *Pitta* along with involvement of *Rasa*, *Rakta* and *Meda*. *Basti Karma* a medicated enema procedure is the best treatment for vitiated *Vata Dosha* and it regulates the movement of *Vata Dosha*. **Objectives:** The present study was conducted to evaluate effect of *Triphaladi Kala Basti* procedure given along with *Arjuna Punarnavadi Ghanavati* in the management of essential hypertension. **Materials and Methods:** Fifteen patients who were diagnosed cases of essential hypertension as per the 7th JNC and World Health Organization criteria for diagnosis of hypertension were treated with *Triphaladi Basti* followed by oral administration of *Arjuna Punarnavadi Ghanavati*. **Results:** Administration of *Basti* and *Arjuna Punarnavadi Ghanavati* were effective in reducing both systolic and diastolic blood pressure level which was highly significant ($P < 0.001$). **Conclusion:** *Triphaladi Kala Basti* procedure along with oral administration of *Arjuna Punarnavadi Ghanavati* is moderately effective in management of systemic arterial hypertension.

Keywords: *Arjuna Punarnavadi Ghanavati*, *Basti Karma*, hypertension

Introduction

Systemic arterial hypertension is resultant of prolonged and excess of stress caused by blood on the wall of arteries. It is an elevated arterial pressure level $>140/90$ mmHg. Essential hypertension affects 90%–95% of hypertensive patients. It has been estimated that hypertension accounts for 6% of deaths worldwide.^[1] The most devastating aspect of this disorder is that it is not characterized by any of the cardinal symptoms and causes damage to vital organ over a period. Persistent hypertension doubles the risk of cardiovascular disease, including coronary heart disease, ischemic and hemorrhagic stroke and renal failure.^[1] The National Health and Nutrition Examination Survey reported that about 16 million hypertensive patients take medicine, but still do not have their blood pressure under control. In 2010 increased blood pressure was the cause of an estimated 9.4 million deaths.

Although antihypertensive therapy clearly reduces the risk of cardiovascular and renal disease, long-term use of antihypertensive drugs is associated with adverse effects.^[2]

According to Ayurveda hypertension is caused by vitiation of *Tridosha* specially *Vata-Pitta*. Ayurveda through its holistic approach and radical treatment like *Panchakarma*, corrects basic pathology by eliminating chief causative factors. *Basti Karma* (medicated enema procedure) is choice of treatment for vitiated *Vata Dosha*. *Basti Karma* regulates the activity and movement of *Vata*. Thus, with this thought, *Basti Karma* with

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Sroto-Shodhaka (macro & micro channels cleanser) drug like *Triphala* was selected for study followed by oral administration of *Arjuna-Punarnavadi* formulation.

Aims and objectives

The present study was planned to evaluate the effect of *Triphaladi Kala Basti* procedure and oral administration of *Arjuna Punarnavadi Ghanavati* in the management of essential hypertension.

Materials and Methods

Fifteen patients were selected from out-patient department and IPD of Panchakarma, National Institute of Ayurveda, Jaipur, who were diagnosed as cases of essential systemic arterial hypertension as per the 7th JNC and World Health Organization (WHO) criteria for diagnosis of hypertension. The study was approved from Institutional Ethics Committee (registration no. RAU/ACa/622/12-13), Dr. Sarvepalli Radhakrishnana Rajasthan Ayurved University, Jodhapur.

Inclusion criteria

1. Patients of either sex from the age group 20 and 60 years
2. Patients who were diagnosed cases of essential hypertension were selected
3. Patients of stage 1 hypertension, stage 2 hypertension, isolated systolic hypertension as per the 7th JNC and WHO criteria were included [Table 1]
4. Patients fit for clinical trial.

Exclusion criteria

1. Secondary hypertension
2. Pregnancy-induced hypertension
3. Patients on oral contraceptive pills, steroids
4. Patients associated with serious illness such as malignancy, HIV and tuberculosis.

Criteria for assessment

Subjective parameters

1. *Shirahshoola* (headache)
2. *Bhrama* (giddiness)
3. *Klama* (fatigue)
4. *Hritdravata* (palpitation)
5. *Swedadhikyata* (excessive sweating)
6. *Anidra* (insomnia).

Table 1 : 7th Joint National Committee and WHO criteria for diagnosis hypertension (HTN)

Category of HTN	Systolic BP (mmHg)	Diastolic BP (mmHg)
Normal	<120	And <80
Prehypertension	120-139	Or 80-89
Stage 1 hypertension	140-159	Or 90-99
Stage 2 hypertension	≥160	Or ≥100
Isolated systolic hypertension	≥140	And <90

HTN: Hypertension, BP: Blood pressure

Assessment of above subjective parameters was done according to grading pattern [Table 2].

Objective parameters

Change in both systolic and diastolic blood pressure level in supine position before treatment and after treatment was assessed.

Patient consent

The treatment procedure with its different steps and the outcome was properly explained in detail to the patients. Written consent from the patient was obtained before enrolling them in the clinical study.

Treatment protocol

Basti procedure

Triphala oil *Anuwasana Basti* (60 ml) and *Triphala* decoction *Niruha Basti* (*Triphala* decoction (240 ml), honey (80 ml), *Saindhava Lavana* (rock salt) (5 g), *Triphala* oil (120 ml), *Shatapushpa* powder [30 g]).

Basti was administered as *Kala Basti* schedule:

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Basti	A	A	N	A	N	A	N	A	N	A	N	A	N	A	A	A

A – *Anuwasana Basti*

N – *Niruha Basti*.

Poorvakarma

Preparation of the patient

On each day, patients were subjected to whole body massage with *Dashamoola* oil for 25–30 min followed by whole body mild fomentation for 5–10 min for 16 days. *Dashamoola* decoction was used for *Swedana*. After recording the vitals, the patients were advised to lie comfortably in the left lateral position on table.

Preparation of Basti Dravya

Anuwasana Basti

60 ml of lukewarm *Triphala* oil with *Shatapushpa* powder and rock salt (*Saindhava Lavana*) (each 1 g) filled into enema syringe fitted with rubber catheter (no. 08).

Niruha Basti

Honey (80 ml) was taken in round bottom bowl. To this rock salt (*Saindhava Lavana*) (5 g) was added and mixed well with the help of mortar till sound disappears. Then, lukewarm *Triphala* oil (120 ml) was poured in to it slowly with continuous trituration till homogenous mixture was formed. *Shatapushpa* powder (30 g) was taken in one bowl and *Kalka* (paste) was prepared using *Triphala* decoction, this was added slowly and mixed properly. later on, lukewarm *Triphala* decoction (240 ml) was added to it little by little and stirred well to get homogenous mixture. This was filtered and made lukewarm by heating indirectly in hot water bath, then poured into *Basti Putaka* [i.e. polythene bag tied to *Basti Netra* (cannula of this apparatus)].

Table 2: The scoring pattern of subjective parameters

Parameters	Applied condition	Score
<i>Shirahshool</i> (headache)	Nil	0
	Rarely headache, relieves without medication	1
	Frequently headache relives by rest, does not disturb daily activities	2
	Frequently severe headache disturbs daily activities requires medication	3
	Continuous/severe headache disturbs sleep and daily activities and also not managed by the medication	4
<i>Bhrama</i> (giddiness)	Nil	0
	Rarely <i>Bhrama</i> for some moment during change of posture	1
	Often for few seconds during change of posture	2
	Often, even in lying condition also	3
	Patient unable to hold himself without any support	4
<i>Klama</i> (fatigue)	Nil	0
	Rarely feeling of tiredness without any exertion	1
	Rarely feeling of tiredness without any exertion with inability in concentration	2
	Frequently feeling of tiredness without any exertion with inability in concentration	3
	Continuous feeling of tiredness without any exertion with inability in concentration	4
<i>Swedadhikyata</i> (excessive sweating)	Able to do both routine and special activities without discomfort	0
	Mild sweating by heavy work	1
	Sweating with moderate work relieves soon	2
	Severe sweating with moderate work	3
	Severe sweating with mild work	4
<i>Hritdravata</i> (palpitation)	No palpitation	0
	Palpitation occasionally	1
	Palpitation sometime	2
	Palpitation frequently	3
	Palpitation almost common	4
	Palpitation at rest	5
<i>Anidra</i> (insomnia)	Sound sleep	0
	Disturbed sleep (wake up 1-2 times a night)	1
	Difficult to onset sleep remains disturbed in night	2
	Very less sleep for small intervals, makes patient irritable	3
	Not getting sleep without medicine	4

Pradhanakarma

Method of administration of *Basti Dravya Anuvasana Basti*

The anal orifice and the tip of the catheter were lubricated with oil and after removing the air from the syringe and the catheter, the catheter was introduced into the anus gently up to 3 *Angula* (fingers) and the piston of the syringe was pressed slowly with uniform force and the oil was pushed into the rectum. The patient was asked to take deep breath and not to shake his body while catheter was introduced.

Then, the patient was advised to lie down in the supine position with hand and legs freely spread over the table. Thereafter, the legs of the patient were raised for three times; the buttocks were gently tapped, simultaneously taps were given on the soles and palm also.

Niruha Basti

Oil was smeared over *Basti Netra* (cannula of enema apparatus) and to the anal orifice, slowly *Basti Netra* was inserted inside the anal orifice in the direction of vertebral column till the first *Karnika* (mark) touches the anus. The patient was asked to take

deep breath and then *Basti Dravya* (medicated oil or decoction for enema) was pushed with gentle pressure without shaking the hands. After that slowly *Basti Netra* was taken out and patient was asked lie down in supine position till he feels urge for defecation.

The observations such as time of administration of *Basti Dravya*, time of expulsion and *Samyak Lakshana* (symptoms of proper administration of enema), *Vyapada* (complication) if any and vitals were noted on each day. Patients were advised to take lukewarm water, avoid heavy and oily foodstuffs and suppression of natural urges, excess traveling or, exercise for one month after completion of *Basti* procedure.

Arjuna Punarnavadi Ghanavati

After *Basti* procedure *Arjuna Punarnavadi Ghanavati* 2 tablets twice a day was administered (each tablet of 500 mg) for 30 days. Then, follow-up of the patients was done weekly up to 1 month. Patients were not taking any other of medicine during follow-up period.

Observations and results

Maximum 60% of patients were from the age group of 41–50 years, 66.66% were female, 86.66% were married, 86.66%

were of Hindu religion, 46.66% were graduate, 73.33% were from middle class, 86.66% were having *Mandagni* (reduced appetite), 73.33% were having *Madhyama Koshtha* (normal bowel habit), 46.66% belonged to *Vata Kapha* constitution, 53.33% patients were taking sweets and 60% patients were having addiction to tea.

Data related to disease

53.33% of patients were not having the positive family history, 60% patients were having chronicity of the disease between 4-10 years. 80% of patients were having history of day sleep, 26.66% of patients were having history of anxiety and stress, 66.66% of patient were taking antihypertensive drugs regularly and 26.66% of patients were not taking any antihypertensive medicine.

Data related to treatment

After administration of *Anuwasana Basti*, 93.33% of patients passed oil with stool and 86.66% patients attained *Indriya Prasadana* (improved perception and function of organs of body). Signs of properly conducted procedure of *Niruha Basti* (such as *Prasrushta Vita*, *Mootra*, *Sameerana* proper evacuation of bowel and improved urine output) was observed in 100% patients, *Agni Dipti* (increased appetite) in 100% patient and lightness in the body in 80% of the patients. Complains of headache and loose motion were observed in 6.66% and 20% of patients, respectively.

The data obtained in clinical study was subjected to statistical tests and was analyzed in two parts:

1. Objective parameters
2. Subjective parameters

Statistical analysis

- Student paired *t*-test (two-tailed, dependent) was used to find the changes in objective parameters
- Wilcoxon test was applied for the assessment of subjective parameter before treatment and after the treatment.

Results

The mean value of systolic blood pressure before administration of *Basti* was 154 mmHg which was reduced to 132.14 mmHg after completion of *Basti* procedure and it was maintained up to 132 mmHg after oral administration of *Arjuna Punarnavadi Ghanavati* which was statistically highly significant. *Basti* procedure was highly effective in reducing both systolic and diastolic blood pressure which was statistically highly significant ($P < 0.001$). After oral administration of *Arjuna Punarnavadi Ghanavati* blood pressure was maintained within normal range which was statistically highly significant ($P < 0.0001$). The mean value of diastolic blood pressure before treatment was 102 mmHg which was reduced to 85.33 mmHg after *Basti* procedure, with 16.34% of relief which was statistically highly significance ($P < 0.0001$). After oral administration of *Arjuna Punarnavadi Ghanavati*, the mean value of diastolic blood pressure, became 87.33 with 14.37% of reduction, on follow-up diastolic blood pressure maintained on 87.33 with same 14.37% of relief [Tables 3 and 4].

Discussion

Hypertension may be considered as *Tridoshaja Vyadhi* with the dominance of *Pitta* and *Vata Dosha*, *Dushti of Rasa* (plasma), *Rakta* (blood) and *Meda* (fat) with *Srotorodha* (obstruction in channels) and *Sirashaitihilya* (tortuous of veins). Among *Panchakarma* treatment, *Basti* procedure is the best treatment for correction of *Vata Dosha*. *Basti* procedure, though it is considered as the best remedy for morbid *Vata*, it is advised even for the treatment of *Pitta Dosha*, *Kapha Dosha* and *Sarvadhātu Ashrita Vyadhi* (systemic disorder).^[3] Using various combinations of ingredients, it is considered good even in other *Dosha*, *Koshtha* (abdomen) and *Marma* (vital parts of body), *Asthi* and *Sandhi Ashrita* (incumbent on bones & joints).

Table 3: Effect of Basti procedure on chief complains (Wilcoxon match paired signed rank test)

Chief complain	BT	After administration of Basti	Mean diff	Percentage relief	SD	SE	w	P
<i>Hritdravata</i> (palpitation)	2.533	1.600	0.9333	36.84	0.5936	0.1533	78	0.0005
		0.8000	1.733	68.41	0.7988	0.2063	120	<0.0001
<i>Bhrama</i> (giddiness)	1.867	1.133	0.7333	39.27	0.4577	0.1182	66	0.0010
		0.7333	1.133	60.68	0.5164	0.1333	105	0.0001
<i>Klama</i> (fatigue)	1.733	1.067	0.6667	38.47	0.4880	0.1260	55	0.0020
		0.8667	0.8667	50.01	0.5164	0.1333	78	0.0005
<i>Shirahshoola</i> (headache)	1.333	0.6667	0.6667	50.01	0.4880	0.1260	55	0.0020
		0.4667	0.8667	65.01	0.6399	0.1652	66	0.0010
<i>Anidra</i> (insomnia)	1.467	0.8667	0.6000	40.89	0.5071	0.1309	45	0.0039
		0.4000	1.067	72.73	0.5936	0.1533	91	0.0002
<i>Swedadhikyata</i> (excessive sweating)	1.267	0.8667	0.4000	31.57	0.5071	0.1309	21	0.0313
		0.4000	0.8667	68.40	0.6399	0.1652	66	0.0010

Arj. Pun. Vati: *Arjuna Punarnavadi Ghanavati*, BT: Before treatment, SD: Standard deviation, SE: Standard error

Table 4: Effect of *Basti* procedure on systolic and diastolic blood pressure (paired *t*-test)

BP	Mean BP (mmHg)		Mean difference	Percentage relief	SD	SE	<i>t</i>	<i>P</i>
	BT	After administration of <i>Basti</i> After oral administration of <i>Arj. Pun. Vati</i> Follow-up						
Systolic blood pressure	154.00	132.14	20.714	13.45	16.723	4.470	6.792	<0.0001
		132.00	22.000	14.28	16.125	4.163	5.284	0.0001
		135.33	18.667	12.12	18.465	4.768	3.915	0.0016
Diastolic blood pressure	102	85.333	16.667	16.34	8.997	2.323	7.174	<0.0001
		87.333	14.667	14.37	11.872	3.065	4.785	0.0001
		87.333	14.667	14.37	12.459	3.217	4.559	0.0004

Arj. Pun. Vati: *Arjuna Punarnavadi Ghanavati*, BP: Blood pressure, SD: Standard deviation, SE: Standard error, BT: Before treatment

Thus, after treatment the cleansing effect of *Basti* in the colon may have its effect all over the body in general and in particular on circulatory system. Thus, *Basti* procedure with drug *Triphala* having *Lekhana* (scraping), *Srotoshodhaka* (body channels cleanser) and *Rakta-Pittashodhaka* (blood purifier) property might have helped to reduce the blood pressure.

In hypertension or in the complications of hypertension, there is involvement of vital organs such as brain, heart and kidney, *Arjuna Punarnavadi Ghanavati* contains herbs which are organ specific and basically *Rasayana* (rejuvenating), *Medhya* (brain tonic), *Mutrala* (diuretic), *Deepana* (appetizer) and *Hridya* (cardiac tonic) in nature provided better and long-lasting relief.

Shamana drug

Arjuna Punarnavadi Ghanavati

Arjuna Punarnavadi Ghanavati was prepared using *Arjuna* (*Terminalia arjuna* Roxb. ex DC.), *Punarnava* (*Boerhaavia diffusa* Linn.), *Guduchi* (*Tinospora cordifolia* (Willd.) Miers ex Hook. f. et Th.), *Gokshura* (*Tribulus terrestris* Linn.), *Shankhapushpi* (*Convolvulus pluricaulis* Chois.), *Draksha* (*Vitis vinifera* Linn.), *Haritaki* (*Terminalia chebula* Retz.), *Pushkarmoola* (*Inula resimosa* Hook. f.) and *Shunthi* (*Zingiber officinale* Roscoe.) The purpose behind taking this *Shamana Yoga* (palliative treatment) is to alleviate remaining *Doshas* after *Shodhdhana* (detoxification of body).

Arjuna possess *Hridya* (cardiotonic) property. *Guduchi* is the drug known for its pacifying tendency against vitiated *Vata-Pitta* and rejuvenating property. Recent research work on *Guduchi* had proved that it repairs the damaged cells of body. The most important biological properties of *Guduchi* reported are antioxidant, anti-diabetic, anti-inflammatory, anti-arthritic, anti-stress, hepatoprotective, immunomodulatory and anti-neoplastic activities.^[4] *Shankhapushpi* is nootropic and neuro-tonic property. *Convolvulus pluricaulis* (The chloroform fraction of the total ethanolic extract) elicited a

significant antidepressant-like effect in mice by interaction with the adrenergic, dopaminergic and serotonergic systems.^[5] *Hritaki* is *Tridoshahara*, It is mild laxative, study was done on aqueous extract of *Terminalia cheubla*, showed that it inhibits the development of age-induced damages by protecting against oxidative stress.^[6] *Shunthi* is anti-inflammatory and is used in cardiac pain. Recent study on *Zingiber officinalis*, in spontaneously hypertensive rats, showed that it reduces systolic blood pressure, atherogenic index and triglyceride levels, more potent in reversing endothelial dysfunction while was devoid of cardiac stimulatory effect.^[7]

Punarnava

Research on *Boerhavia diffusa* reveals that, this medicinal plant might be potent and novel therapeutic agents for scavenging of NO and the regulation of pathological conditions caused by excessive generation of NO and its oxidation product, peroxynitrite, NO damages endothelial layer of arteries which leads to high blood pressure, *B. diffusa* helps to inhibit damage to arteries and thus reduces blood pressure.^[8]

Conclusion

Hypertension is *Tridoshaja Vyadhi* with the dominance of *Pitta* and *Vata Dosha*. The cleansing effect of *Basti* in the colon may have its effect all over the body in general and in particular on the circulatory channel system which may help to reduce blood pressure and oral administration of *Arjuna Punarnavadi Ghanavati* contains drugs which are basically *Rasayana* (rejuvenating), *Medhya* (brain tonic), *Mutrala* (diuretic), *Deepana* (appetizer) and *Hridya* (cardiac tonic) in nature and thus also help to maintain blood pressure level. Thus it can be concluded that. *Triphaladi Kala Basti* procedure with *Arjuna Punarnavadi Ghanavati* is moderately effective in the management of essential hypertension.

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Conflicts of interest

There are no conflicts of interest.

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