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Access this article online
Website: www.ayujournal.org
DOI: 10.4103/0974-8520.115455
Quick Response Code:

Clinical Research

Efficacy of *Virechana* and *Basti Karma* with *Shamana* therapy in the management of essential hypertension: A comparative study

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Abstract

Considering high prevalence and the need to look for alternative medicine, essential hypertension was screened in light of *Vata–Pitta Pradhana Rakta Pradoshaja Vikara* as mentioned by *Acharya Charaka*. Comparing the etiological factors, symptomatology, and complications with *Rakta Pradoshaja Vikara* with that of essential hypertension, a striking similarity was revealed. To prove the practical approach of management of *Vata–Pitta Pradhana Rakta Pradoshaja Vikara*, a randomized open clinical trial on 33 uncomplicated subjects of essential hypertension was conducted. The subjects were allotted in two groups, viz. (Group A) *Virechana* group having 16 cases who underwent *Virechana Karma* by *Trivrita*, *Aragvadha*, *Eranda Taila*, and *Draksha Kwatha* as *Sahapana;* and (Group B) *Basti* group consisting of 17 cases who were administered *Dashmoola Kala Basti* in which *Niruha* with *Dashmoola Kwatha* and *Anuvasana* with *Dashmoola Taila* was done. Patients of both the groups were followed by *Shamana Chikitsa (Arjunadi Ghanavati)*. The overall effect of the therapies on systolic and diastolic blood pressure showed that *Virechana* proved better relief (43.75%) as compared to *Basti* (29.41%). The response was encouraging and has created scope for further studies.

Key words: *Basti Karma*, essential hypertension, *Raktapradoshaja Vikara, Virechana Karma*

Introduction

Hypertension is called a silent killer because it rarely causes symptoms before it damages the heart, kidneys or brain.[1] It is estimated that 600 million people are affected worldwide with hypertension. By the year 2025, approximately 1 in 3 adults aged over 20 years, totally 1.56 billion people worldwide, will have hypertension.[2] Hypertension is an important public health challenge in both economically developing and developed countries. Significant numbers of individuals with hypertension are unaware of their condition and, among those with diagnosed hypertension, treatment is frequently inadequate. Measures are required at a population level to prevent the development of hypertension and to improve awareness, treatment, and control of hypertension in the community.[2] Moreover, persistent hypertension is one of the risk factors for strokes, heart attacks, heart failure, and arterial aneurysm, and is a leading cause for chronic renal failure. Even moderate elevation of arterial Blood Pressure (BP) leads to shortened life expectancy and causes 5 million premature deaths each year worldwide.[3]

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The disease Essential Hypertension (EHT) is neither denoted in *Samhita* nor in any *Samgraha Granthas*, but it is stated that every disease cannot be given nomenclature.[4] The term "hypertension" was coined after the invention of sphygmomanometer, however before that about its existence, one can trace the pathway on the tract of symptomatology.

Essential hypertension in the perspective of *Rakta Pradoshaja Vikara*

Regarding EHT, though it is not mentioned in classics, the *Rakta Pradoshaja Vikara* concept helps to visualize and successfully categorize it as a *Vata Pitta Pradhana Rakta Pradoshaja Vikara* in Ayurvedic parlance.[5]

On the basis of strong similarity between etiological factor,[6-8] symptom,[5,9] and *Doshika* involvement in the etiopathology and complication,[10] EHT[11] can be correlated with *Vata Pitta Pradhana Rakta Pradoshaja Vikara*.

Rationale behind application of *Virechana* and *Basti* in the EHT

Acharya Charaka says when *Vata* is obstructed by *Pitta*, *Kapha*, *Meda*, and *Rakta*, *Virechana* should be given with *Eranda Taila*.[12,13] In EHT, the chief culprit is *Vyana Vayu*, and is a disease of *Bahya*,[14] *Madhyama Rogamarga*, and *Marmagata Vyadhi*. In these conditions, *Basti* is the main line of treatment. In both the procedures, mild purgation will occur. As to the mechanism of action of laxative that has been stated in pharmacology, "the laxatives are also likely to act through multiple mechanisms affecting the epithelial transfer directly or indirectly, leading to decreased sodium absorption and increase in chloride excretion by epithelial cell." This provides a hint that mild laxative action may help in reducing the sodium retention and thus controlling the BP. Both the groups were followed by administration of *Arjunadi Ghanavati* as the *Shamana Yoga* which has *Arjuna* (*Terminalia arjuna*), *Guduchi* (*Tinospora cordifolia*), *Gokshura* (*Tribulus terrestris*), *Shankhpuhspi* (*Convolvulus pluricaulis*), *Jatamamsi* (*Nordostachys jatamansi*), and *Guggulu* (*Commiphora mukul*).[15]

With this background, it is planned to evaluate and compare the efficacy of *Virechana* and *Basti Karma* in the management of EHT.

Materials and Methods

The patients were selected randomly from Outdoor Patient Department (OPD) and Indoor Patient Department (IPD) of Panchakarma Department of IPGT and RA, Jamnagar Hospital, irrespective of gender, caste, religion, occupation, etc.

Inclusion criteria

Criteria for the selection of the patients were based on the criteria suggested by WHO and JNC-VII (2003). Patients between the age 20 to 60 years were included.

Exclusion criteria

Ischaemic Heart Disease (IHD), Congestive Heart Disease (CHD), Coronary Artery Disease (CAD), coarctation of aorta, renal failure, endocrine diseases, hypertension with cerebral complications, e.g. hypertensive encephalopathy, cerebral haemorrhage, convulsive seizure, and patients having systolic BP more than 180 mm Hg and diastolic pressure more than 110 mm Hg.

Investigations

1. Routine hematological investigations – haemoglobin %, Total Leucocyte Count (TLC), Differential Leucocyte Count (DLC), Erythrocyte Sedimentation Rate (ESR),
2. Biochemical parameters – blood urea, serum creatinine, serum cholesterol, triglyceride, High-Density Lipoprotein (HDL), fasting and postprandial blood sugar,
3. Routine and Microscopic urine examination
4. Routine and Microscopic examination of stool
5. Electrocardiography (ECG) and X-ray chest, wherever required. These investigations were conducted to exclude any other underlying pathology.

Groups of treatment

The patients were randomly categorized into the following two groups.

Virechana group (Group A)

In this group, a total of 20 patients were registered, out of whom 16 completed and 4 discontinued the course of therapy.

Basti group (Group B)

In this group, a total of 20 patients were registered, out of whom 17 completed and 3 discontinued the course of treatment.

Schedule for *Virechana Karma*

Deepana Pachana

As per the condition of *Agni*, *Deepana* and *Pachana* was done for 2-3 days by *Trikatu Churna* in a dose of 3 g twice in a day.

Snehana

According to *Koshtha* and *Agni*, *Shuddha Goghrita* was given for *Snehapana* in an increasing dose of 30–50 ml/day for a period of 3-7 days.

Bahya Snehana and *Swedana*

Bala Taila Bahya Snehana and *Sarvanga Mridu Vashpa Sweda* were done twice for 3 days after achieving *Samyak Sneha Lakshana*.

Virechana Karma

Virechana Kashaya was prepared by mixing 100 g of *Trivrit (Operculina turpethum) Yavakuta*, 50 g of *Aaragwadha (Cassia fistula) Phalamajja*, and 70 ml of *Eranda (Ricinus communis) Taila*. It was given in the morning at 10 a.m. with 100 ml of *Draksha Hima* (cole infusion of *Vitis vinitera* Linn.) as *Sahapana*.

Samsarjana Krama

Depending upon *Shuddhi*, *Samsarjana Krama* was done for 3-7 days in which *Peya*, *Vilepi*, *Yusha*, *Ghrita Yukta Krushara*, etc., were given after *Virechana*.

Schedule for *Kala Basti Karma* (16 *Basti* = 6 *Niruha* + 10 *Anuvasana*)

In the *Kala Basti* schedule, one alternating with the other, 10 *Anuvasana* and 6 *Niruha Basti* were given. In the beginning, one *Anuvasana Basti* and at the end, three *Anuvasana Basti* were given for the purpose of oleation. In this group, *Niruha Basti* was given of *Dashmoola Kwatha* and *Anuvasana* by *Dashmoola Taila*.

Niruha Basti

The *Niruha Basti* administered was a homogenous colloidal solution measuring totally 480 ml, which contained 60 g *Makshika*, 5 g *Saindhava*, 90 ml *Tila Taila*, 25 g *Shatpuspa kalka*, and 300 ml *Dashmoola Kwatha*. *Niruha Basti* was given in empty stomach after proper digestion of meal taken in the previous night had taken place, at about 8 a.m.-9 a.m. in the morning.

Anuvasana Basti

60 ml of *Dashmoola Taila* was given after meal at about 10 a.m.-12 noon. After completion of *Kala Basti*, *Arjunadi Ghana Vati* was given according to the following posology.

Arjunadi Ghana Vati

Shamana drug was started after 7 days in both the groups. *Arjunadi Ghana Vati* was given in a dose of 2 tablets (500 mg each) twice in a day with lukewarm water after meal for a period of 30 days.

Diet

Normal routine diet free from excessive *Lavana*, *Sneha*, *Katu*, *Amla Rasa*, etc.

Criteria for assessment

A. Scoring pattern for assessment of BP[16]

Diastolic BP (mm Hg) (DBP)

Grading	Score
80> Optimal	–1
85> Normal	0
85-89 High-normal	1
90-99 Stage 1 hypertension	2
100-109 Stage 2 hypertension	3

Systolic BP (mm Hg) (DBP)

Grading	Score
120> Optimal	–1
130> Normal	0
130-139 High-normal	1
140-159 Stage 1 hypertension	2
160-179 Stage 2 hypertension	3

To calculate the % relief in BP, the normal levels of SBP (i.e. <140 mm Hg) and DBP (i.e. <90 mm Hg) were considered to be baseline values, and so percentage relief was calculated at the end by using the formulae:

% Relief in SBP = [(BT − AT)/(BT − 139)]× 100

% Relief in DBP = [(BT − AT)/(BT − 89)]× 100

Here, the BT value shows the BP level before treatment and AT denotes the level achieved after treatment. The after treatment (AT) levels were calculated both after *Samsarjana* (or 7 days after completion of *Virechana* and *Kala Basti*) and after *Shamana*. All the comparisons were made separately between BT values and AT values achieved after *Samsarjana* (or 7 days after completion of *Virechana* and *Kala Basti*) and between BT values and AT values of *Shamana* treatment.

Assessment on basis of Systolic and Diastolic blood pressure level

(1) Controlled patients having blood pressure levels within normal limit
(2) Marked relief blood pressure level improved by ≥75% than before treatment
(3) Moderate relief blood pressure level improved by ≥50-74% than before treatment
(4) Mild relief blood pressure level improved by ≥25-49% than before treatment
(5) No relief blood pressure level not improved or improved by <25% than before treatment.

B. Scoring pattern for assessment of signs and symptoms:

Grading	Score
Akshirag	
Nil	0
Rarely and mild redness remains for small duration	1
Frequently and moderate/mild redness remains present for 2-3 hrs	2
Often and moderate/severe redness remains for longer duration	3
Continuous and moderate/severe redness nearly always present	4
Raktapitta	
Nil	0
Rarely bleeding from *Bahirmukha Srotasas* in very small quantity	1
Frequently bleeding from *Bahirmukha Srotasas* in very small quantity	2
Often bleeding/Severe bleeding from *Bahirmukha Srotasas* require immediate emergency management	3
Persistent bleeding from *Bahirmukha Srotasas* require immediate emergency management	4
Santapa	
Nil	0
Rare feeling of hotness in head only, does not disturbs functions and daily activities relieves by cold application	1
Frequent feeling of hotness in head only disturbs functions but not daily activities relieves by cold application	2
Frequent feeling of hotness in all over body disturbs functions and daily activities both require medication	3
Continuous feeling of hotness in all over body disturbs functions and daily activities requires medication	4
Shirashoola	
Nil	0
Rarely Headache relieves without medication	1
Frequently Headache relives by rest doesn't 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
Klama	
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
Arati	
Nil	0
Rarely irritation of mind, by major provocation and for very short duration	1
Rarely irritation of mind by moderate to major provocation for long duration	2

Often irritation of mind by mild to major provocation for short duration	3
Continuous irritation of mind by any provocation	4
Bhrama	
Nil	0
Rarely *Bhrama* for some movement during change of posture	1
Often for some movement during change of posture	2
Often for each movement even in lying condition also	3
Patient unable to hold himself without any support	4
Nidra	
Sound sleep	0
Disturbed Sleep wake up 1-2 times a night (*Khandita Nidra*)	1
Difficult to onset Sleep remains disturbed in night (*Alpa Nidra*)	2
Very less Sleep in small intervals makes patient irritable (*Ati alpa Nidra*)	3
Not getting sleep without medicine (*Anidra*)	4
Tandra	
Nil	0
Tandra one time in a day without disturbing functions and daily activities	1
Tandra two to three times a day disturbing functions but not daily activities	2
Often *Tandra* disturbing functions and daily activities	3
Continuous *Tandra* make patient to sleep	4
Mada	
No defect in functions of mind	0
Occasionally mind drowsiness not disturbs functions and daily activity	1
Occasional mind drowsiness disturbs functions but not daily activities	2
Frequent mind drowsiness disturbs functions and daily activities	3
Continuous mind drowsiness make patient for bed ridden	4
Buddhi Sanmoha	
Normal	0
Rarely loss of power of thinking and decision for short duration disturbs functions but not daily activities	1
Rarely loss of power of thinking and decision for long duration disturbs functions and daily activities	2
Frequently loss of thinking and decision for short duration disturbs functions but not daily activities	3
Continuous loss of thinking and decision disturbs functions and daily routine	4
Tamaha Darshana	0
Nil	
Rarely *Tamaha Darshana* for short duration	1
Rarely *Tamaha Darshana* for small duration leads to *Bhrama*	2
Frequently *Tamaha Darshana* for small duration leads to *Bhrama*	3
Frequently *Tamaha Darshana* persist for longer duration make patient to sleep	4
Krodha-Prachurata	
Normal	0
Rarely angry by major provocation and for very short duration	1
Rarely angry by moderate to major provocation for long duration	2
Often angry by mild to major provocation for short duration	3
Continuous angry and irritable	4

Assessment on the basis of relief in complaints

(1)	Controlled	100% relief in complaints
(2)	Marked relief	≥75% relief in complaints
(3)	Moderate relief	≥50-74% relief in complaints
(4)	Mild relief	≥25-49% relief in complaints
(5)	No relief	<25% relief in complaints

Observations and Results

In this study, all the patients were in the age group of 20-60 years. However, majority of the patients (46.80%) were between 41 to 60 years of age. Majority of the patients (65%) were females, 45% patients were having *Vata–Pitta Deha Prakriti*, and 72.50% were having *Raja Pradhana* type of *Manas Prakriti*. 57.50% of patients were having *Mandagni* and 35% were having *Vishmagni*, while 62.5% were having *Madhyama Koshtha*. Patients of this series have predominantly reported the use of *Guru*, *Snigdha*, *Ushna*, and *Vidahi* variety of food items, and 70% patients reported *Divaswapna*. 22.5% were addicted to tobacco, followed by 10% patients who were addicted to alcohol and 7.50% were addicted to cigarette smoking. Out of the *Manasika Nidanas*, *Chinta* (82.5%), *Shoka* (60%), *Chittodvega* (40%), *Krodha* (25%), *Vishada* (32.5%), and *Tamogunadhikya* (27.5%) were predominantly reported. Patients in this study reported clinical symptoms like *Anidra/Alpanidra* (92.5%), *Shirahshoola* (90%), *Bhrama* (67.5%), *Santapa* (65%), *Buddhi Sammoha* (50%), *Klama* (42.5%), *Tamodarshana* (17.5%), *Arati* (32.5%), *Akshiraga* (40%), and *Krodhaprachurata* (35%). *Vata* and *Pittadushti* were reported in 90% and 85% of patients, respectively. However, *Kaphadushti* was reported in 80% patients. *Pranavaha Srotodushti* was reported in 20% patients and *Rasavaha Srotodushti* was seen in 75% patients. *Raktavaha* was found in 75%, *Medovaha* in 85%, *Purishavaha Srotodushti* in 62.5%, and *Swedavaha Srotodushti* was found in 37.5% patients. Nearly 42.5% patients were having chronicity (1-3 years). The 32.5% patients reported having SBP between 140 and 159 mm Hg, and 67.5% patients reported an SBP between 160 and 179 mm Hg. DBP of 57.5% patients was between 100 and 109 mm Hg, and 42.5% reported having DBP between 90 and 99 mm Hg.

Comparing the effect of therapies on SBP and DBP and other chief and associated complaints, it was seen that effect in *Virechana* group was better on SBP, *Bhrama*, *Shirahshoola*, *Klama*, *Krodhaprachurata*, *Tamohdarshana*, *Anidra*, and *Shrama*. *Virechana* group showed better results in the overall effect of therapy. Thus, the effect of *Virechana* group is more than that of *Basti* group and validates involvement of *Raktapradosha* and *Vata Pitta Pradhanata* in the pathology of EHT [Tables 1-5].

Discussion

The 7.09% relief in SBP after *Samsarjana Krama* was reported in Group A and 10.99% relief was reported at completion of *Basti*

Table 1: Effect of *Virechana* and *Basti* on systolic and diastolic blood pressure

Chief complaint	% Relief in *Virechana* group		% Relief in *Basti* group	
	A.SJ.	A.S.	A.B.	A.S.
Systolic blood pressure	7.09	5.07	10.99	12.05
Diastolic blood pressure	5.07	14.48	4.21	9.13

A.SJ.: After *Samsarjana*, A.S.: After *Shamana*, A.B.: After *Basti*, A.S.: After *Shamana*

Table 2: Effect of *Virechana* and *Basti* on chief complaints

Chief complaint	% Relief in *Virechana* group		% Relief in *Basti* group	
	A.SJ.	A.S.	A.B.	A.S.
Akshiraga	45.45	54.54	25	41.67
Raktapitta	40.00	80.00	40	80
Santapa	42.85	66.67	41.37	55.17
Krodhaprachurata	44.44	44.44	50	50
Bhrama	20.00	56.25	31.81	68.18
Shirahshoola	46.66	66.67	41.93	67.74
Klama	33.33	75.00	50	75
Arati	45.45	72.72	44.44	77.78
Anidra/Alpanidra	43.75	65.62	43.58	69.23
Tandra	50.00	50.00	66.67	66.67
Mada	100.00	80.00	-	-
Buddhi Sanmoha	46.15	46.15	31.25	50
Tamahdarshana	17.78	80.00	0	100

A.SJ.: After *Samsarjana*, A.S.: After *Shamana*, A.B.: After *Basti*, A.S.: After *Shamana*

Table 3: Overall effect of *Virechana* and *Basti* on chief and associated complaints

Relief in chief complaint	*Virechana* group (*n*=16)		*Basti* group (*n*=17)	
	% of patients A.SJ.	% of patients A.S.	% of patients A.B.	% of patients A.S.
Controlled	0	12.50	0	5.88
Marked relief	0	18.75	0	35.29
Moderate relief	31.25	43.75	23.53	41.17
Mild relief	56.25	18.75	58.82	17.65
No relief	12.50	6.25	17.65	0

A.SJ.: After *Samsarjana*, A.S.: After *Shamana*, A.B.: After *Basti*, A.S.: After *Shamana*

in Group B. Total 13.12% relief was recorded after *Shamana* in group A and 12.05% relief was found after *Shamana* in Group B. Percentage relief was more in *Basti* group but was statistically insignificant, and relief was less in *Virechana* group but was statistically significant, while after *Shamana*, relief was more in *Virechana* group and both the groups showed statistically highly significant result [Table 6].

In *Virechana* group, 5.07% relief was found in DBP after *Samsarjana Krama*, and 4.21% relief was reported at completion

Table 4: Overall effect of *Virechana* and *Basti* on systolic blood pressure

Relief in systolic blood pressure	*Virechana* group (*n*=16)		*Basti* group (*n*=17)	
	% of patients A.SJ.	% of patients A.S.	% of patients A.B.	% of patients A.S.
Controlled	6.25	43.75	5.88	29.41
Marked relief	25	18.75	11.76	11.76
Moderate relief	12.50	25	11.76	29.41
Mild relief	25	12.25	41.17	29.41
No relief	31.25	0	29.41	0

A.SJ.: After *Samsarjana*, A.S.: After *Shamana*, A.B.: After *Basti*, A.S.: After *Shamana*

Table 5: Overall effect of *Virechana* and *Basti* on diastolic blood pressure

Relief in diastolic blood pressure	*Virechana* group (*n*=16)		*Basti* group (*n*=17)	
	% of patients A.SJ.	% of patients A.S.	% of patients A.B.	% of patients A.S.
Controlled relief	00	37.5	23.53	47.05
Marked relief	12.50	18.75	0	29.41
Moderate relief	18.75	6.25	5.88	11.76
Mild relief	56.25	25	35.29	5.88
No relief	12.50	12.50	35.29	5.88

A.SJ.: After *Samsarjana*, A.S.: After *Shamana*, A.B.: After *Basti*, A.S.: After *Shamana*

of *Basti*, while 14.48% relief was recorded after *Shamana* in Group A and 9.13% relief was found after *Shamana* in Group B. In *Basti* group, the results were highly significant both after *Basti* and *Shamana*, while in the *Virechana* group it was statistically highly significant after *Samsarjana Krama* and statistically significant after *Shamana* [Table 7].

Mode of action of *Virechana*

The *Virechana Karma* clears the *Margavarodha* (obstruction), eliminates the morbid *Doshas* from *Rakta*, and regulates the activity and movement of *Vata*. Thus, it controls the high BP. According to the modern point of view, during *Virechana* process, the inflammation of intestinal mucosa leads to hyperemia and exudation resulting into increased passage of protein-rich fluids through vessel walls to intestinal lumen. Increase in fluid volume also results in the dilution of toxic material. Evacuation of the fluid from *Rasa-Rakta* by *Virechana* is the direct process that leads to decrease in fluid volume.

Few studies correlated acetylcholine with *Vata*, catecholamine with *Pitta*, and histamine with *Kapha*. It has been observed that after *Virechana*, there is reduction in the plasma catecholamine contents of the patients to a statistically significant level. In that study, it has been observed that the effect of *Virechana* on neurohumors was highly significant.[17] *Virechana* evacuates all morbid *Doshas* from all micro to macro *Dhatu* channels and regulates *Vata*, thus decreasing all symptoms of *Vata*, *Pitta*, and *Kapha* on *Srotasa* level.

Table 6: Systolic blood pressure

Group A	Relief %		*P*	Group B	Relief %		*P*
Systolic blood pressure (mm Hg)	A.SJ.	07.09	<0.001	Systolic blood pressure (mm Hg)	A.B.	10.99	>0.5
	A.S.	13.12	<0.001		A.S.	12.05	<0.001

A.SJ.: After *Samsarjana*, A.S.: After *Shamana*, A.B.: After *Basti*, A.S.: After *Shamana*

Table 7: Diastolic blood pressure

Group A	Relief %		*P*	Group B	Relief %		*P*
Diastolic blood pressure (mm Hg)	A.SJ.	05.07	<0.001	Diastolic blood pressure (mm Hg)	A.B.	4.21	<0.001
	A.S.	14.48	<0.02		A.S.	9.13	<0.001

A.SJ.: After *Samsarjana*, A.S.: After *Shamana*, A.B.: After *Basti*, A.S.: After *Shamana*

Probable mode of action of *Basti*

It can be understood in the following ways: (1) By absorption mechanism, (2) by system biology concept, and (3) by neural stimulation mechanism.

By absorption mechanism

Dashmoola Taila Anuvasana Basti, after reaching the rectum and colon, causes secretion of bile from gall bladder, which leads to the formation of conjugate micelles which are absorbed through passive diffusion. Especially the middle-chain fatty acid present in *Dashmoola Taila* of *Anuvasana Basti* can get absorbed from colon and large intestine part gastrointestinal tract (GIT) and break the pathology of disease.

By system biology concept

The latest concept of system biology makes it clearer how *Basti* can act on the organ systems. This theory believes that all the organs are interconnected at molecular level. Any molecular incident is transformed at cellular level, then at tissue level and ultimately at organ level. Thus, the effects of *Basti* on gastrointestinal system will definitely affect another system and help to get the bodily internal homeostasis.

By neural stimulation mechanism

BP is regulated by the feedback of the neural tissue of Vaso-Motor Center (VMC). VMC activity in turn depends upon reflexes from periphery (neural and chemical) and from higher centre. Sympathetic stimulation causes activation of pressure area of VMC, which in turn causes vasoconstriction and leads to rise in BP, while parasympathetic stimulation causes activation of depressor area of VMC, which in turn results in vasodilatation and precipitates decrease in BP.[18]

The long-term regulation of BP occurs through Renin–Angiotensin–Aldosterone (RAA) axis of endocrine mechanisms. Lower part of GIT is richly supplied with parasympathetic nerves which on stimulation with *Basti* (either by chemical or mechanical receptor) may cause decrease in secretion of RAA complex, and by activating depressor area of VMC which causes vasodilatation and results in decrease in BP.

Enteric Nervous System (ENS) works in synergism with the CNS on stimulation with *Basti* (either by chemo or mechano receptors) and may lead to activation of depressor area of VMC, which finally causes decrease in BP. It is not mandatory for a drug to remain in contact with the receptor for long time e.g. in proton pump inhibitor mechanism, the drug interacts with receptor and gets flushed out from circulation, it is known as "hit and run module" of kinetics. The same module of kinetics can be hypothesized for *Niruha Basti*.

Conclusion

As *Virechana Karma* has shown significant decrease in SBP and DBP, along with fasting and postprandial blood sugar, cholesterol, triglyceride, and increase in HDL level, in conditions where EHT is found to be associated with *Sthoulya*, *Prameha*, and hyperlipidemia, *Virechana* may be the therapy of choice. *Basti* has shown statistically significant improvement in SBP, DBP, and *Shirahshoola*, *Anidra*, *Santapa*, *Bhrama*, *Buddhi Sanmoha*, so in conditions where EHT is found to be associated with the above-mentioned symptoms and other *Vata Vyadhis*, *Basti* may be selected as the first line of treatment. *Shamana Yoga* (*Arjunadi Ghanavati*) used in this research may be used as a good treatment modality for the management of the EHT. *Virechana* and *Basti Karma* provide more relief and synergistic effect in the management of EHT when followed by the *Arjunadi Ghanavati*. However, the difference in improvement between *Virechana* and *Basti Karma* is statically insignificant, but on comparing percentage improvement, *Virechana* has shown better result.

References

1. WHO report of prevention and control for Cardio vascular diseases, 2001-2002. Available from: http://www.sld.cu/./pdf/./international_cardiovascular_disease_statistics.page2. [Last cited on 2002 Aug 25].
2. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: Analysis of worldwide data. Lancet 2005;365:217-23.
3. WHO World Health Report. Available from: http://www.who.int/whr/2002. [Last cited in 2002].
4. Agnivesha, Charaka, Dridhabala, Charaka Samhita, Sutra Sthana, Trishothiya Adhyaya, 18/44, Vaidya Jadavji Trikamji Acharya, editor, 2nd ed. Varanasi: Chaukhamba Sanskrit Sansthan; 2008. p. 108.
5. Ibidem, Charaka Samhita, Sutra Sthana Vidhishonitiya Adhyaya, 24/11-16; 124.
6. Ibidem, Charaka Samhita, Sutra Sthana Vidhishonitiya Adhyaya, 24/5-10; 124.
7. Vagbhata, Ashtanga Samgraha, Sutra Sthana, 18/14, Hindi Commentary by R.D. Tripathi, 2nd ed. Varanasi: Chaukhamba Sanskrit Sansthan; 1992.
8. Agnivesha, Charaka, Dridhabala, Charaka Samhita, Sutra Sthana, Vidhishonitiya Adhyaya, 24/7, Vaidya Jadavji Trikamji Acharya, editor, 2nd ed. Varanasi: Chaukhamba Sanskrit Sansthan;,2008. p. 124.
9. Ibidem, Charaka Samhita, Sutra Sthana, Vividhashitpitiya Adhyaya, 28/11; 179.
10. Ibidem, Charaka Samhita, Sutra Sthana Vidhishonitiya Adhyaya, 24/25-27; 125.
11. Braunwald E, Isselbacher KJ, Wilson JD, Martin JB, Kasper DL, Hauser SL, *et al.* Harrison's Principles of Internal Medicine. 14th ed., vol. 1. New York: McGraw Hill Publication; 1998. p. 1382.
12. Agnivesha, Charaka, Dridhabala, Charaka Samhita, Sutra Sthana,

Vidhishonitiya Adhyaya, 24/18, Vaidya Jadavji Trikamji Acharya, editor, 2nd ed. Varanasi: Chaukhamba Sanskrit Sansthan; 2008. p. 125.
13. Ibidem, Charaka Samhita, Chikitsa Sthana, Trimarmiya Chikitsa Adhyaya, 26/29; 598.
14. Ibidem, Charaka Samhita, Chikitsa Sthana, Vatavyadhi Chikitsa Adhyaya, 28/239; 627.
15. Shukla GD. A comparative study of efficacy of Virechana and Basti Karma with Shamana therapy in the management of Essential Hypertension, M.D.(Ayu.) dissertation. IPGT and RA, Gujarat Ayurved University, Jamnagar; 2010.
16. Summary of the JNC – V and WHO International Society of Hypertension ISH Special Report. Available from: http://www.nhlbi.nih.gov/guidelines/hypertension/phycard.pdf. [Last cited in 2004].
17. Bhuyan G. A Critical Study on aetiopathogenesis of Uchharaktachapa (Essential Hypertension) and its management with Virechana Yoga and Shamana Yoga (Herbal Compound). IPGT and RA, Gujarat Ayurved University, Jamnagar; 2004.
18. Dollery CT. Arterial Hypertension. In: Wyngarden JB, Smith LH, editors. Cecil Text Book of Medicine. Chap. 47, 17th ed. Philadelphia: WB Saunders Co.; 1985.

हिन्दी सारांश

उच्चरक्तचाप चिकित्सा में विरेचन एवं बस्ति कर्म के शमनानुषङ्गिक प्रभाव का तुलनात्मक अध्ययन

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उच्चरक्तचाप का आयुर्वेद संहिताओं में वर्णन न होते हुए भी इस व्याधि के निदान, लक्षण एवं उपद्रव का साम्य वातपित्त प्रधान रक्तदोषज विकार से पाया गया । उच्चरक्तचाप के ३३ रोगियों को २ वर्गो में विभाजित किया गया । इस अध्ययन में प्रथम वर्ग के १६ रोगियों को त्रिवृत्त, आरग्वध, एरण्ड तैल के योग से विरेचन कर्म तथा दूसरे वर्ग के १७ रोगियों को दशमूल कालबस्ति के पश्चात्; दोनो वर्गों में अर्जुनादि घनवटी का एक मास तक सेवन कराया गया । रक्तचाप में विरेचन वर्ग के रोगियों को बस्ति वर्ग के रोगियों से अधिक लाभ प्राप्त हुआ किन्तु उच्चरक्तचापजनित लक्षणों में बस्ति वर्ग में अधिक लाभ प्राप्त हुआ ।