Published online in http://ijam.co.in ISSN No: 0976-5921

International Journal of Ayurvedic Medicine, Vol 13 (1), 164-170

Shaddharanayoga (SD) *Churna* in the management of *Adhi-rakthachapaya* (Hypertension): A Case series

Case Report

Narathota SNL[1*], Fasla MSF[2], Gayathri KGS[2], Rasadari PDI[2], Rangani GT[2], Ruwanthi AGS[2], Senarathne TCJ[3]

1. Temporary Demonstrator, Unit of Shalya Shalakya, Institute of Indigenous Medicine – University of Colombo,
2. Former Intern Medical Officer, 3. Ayurveda Medical Officer,
Bandaranaike Memorial Ayurvedic Research Institute. Nawinna. Sri Lanka.

Abstract

Poly herbal Ayurveda medicine *Shaddharanayoga* (SD) consists six drugs including *Plumbago indica* L., *Holarrhena pubescens* L., *Cissampelos pareira* L., *Picrorhiza scrophulariiflora* Pennell., *Aconitum heterophyllum* Wall. and *Terminalia chebula* Retz. Though SD is mentioned in Ayurveda authentic texts for abdominal diseases (*Amashagatha vatha*), commonly used to treat Hypertension (*Adhi-rakthachapaya*). Present study focused on literary survey, laboratory tests to analyze physical parameters of SD *Churna* (powder) and case series to find therapeutic efficacy of SD *Churna* on ten patients in age group 30-70 years with BP ≥ 140/90mmHg and not taking any medications for HTN. SD *Churna* was prescribed for six days and BP was measured before and after treatment. Literature survey revealed that SD is prominent with *Thiktha rasa* (bitter taste), *Laghu guna* (light property), Ushna veerya (hot potency) and *Katu vipaka* (pungent final digestive transformation). This helps to reduce pathogenesis of *Adhi-rakthachapaya* by acting on vitiated *Kapha*, *Vatha doshas* and *Medo dhathvagni* lowering *Medovriddhi*. After proper identification and authentication, SD *Churna* was prepared according to drug recipe in *Bhava Prakasha* and analyzed for physical parameters. SD *Churna* was a moderately coarse powder having particle size ranging from <500µm - >250µm with an acidic pH of 4.74. Moisture content which gives an idea about shelf life was 0.2817% and Ash value was also tested. Results of case study showed reduction in blood pressure and other abdominal conditions like loss of appetite and constipation. Study will be proceeded to further clinical studies and laboratory investigations to analyze chemical components of SD *Churna.*

Key Words: SD Churna, Hypertension (HTN), Abdominal diseases, Laboratory testing, Blood pressure (BP).

Introduction

Ayurveda is an Indian philosophy that mainly focusses on maintaining good health by balancing physical, mental and spiritual well-being. (1) Hypertension is a non-communicable disease which is more prevalent in modern day society. According to WHO records, more than 1.13 billion people present with Hypertension. According to this report 1 in 4 in men and 1 in 5 in women had been suffering from Hypertension. (2). Hypertension is a major risk factor for Stroke (Ischemic and Hemorrhagic), Myocardial Infarction (MI), Heart failure, Peripheral Vascular Disease (PVD), cognitive decline and vision loss. Untreated Hypertension is associated with progressive rise in blood pressure resulting vascular and renal damage. (3) Blood pressure is quantified as Systolic and Diastolic pressures and measured in millimeters of Mercury (mmHg). Systolic blood pressure represents the peak pressure due to ventricular contraction during systole where Diastolic blood pressure represents pressure during ventricular relaxation. (3) Normal blood pressure is 120/80 mmHg and Blood pressure more than 140/90 mmHg is known as Hypertension. (4) In a normal individual, blood pressure varies throughout the day. Temporary rise of BP is completely natural and blood pressure will generally return to normal during rest. BP depends on the time of day, amount of fluid in body, medicines, work. emotions, exercises and sleep. The exact cause of high blood pressure is often not clear. (5) However, various lifestyle conditions and behaviors have been known to significantly contribute in high blood pressure. Being overweight, not getting enough physical exercises, drinking more alcoholic drinks, stress, old age, smoking, positive family history are the risk factors. (6)

In Ayurveda this condition is correlated to '*Adhi rakthachapaya'* and it is not mentioned as a separate disease in Ayurveda. This condition is described as malfunctioning of *Rasavaha srothas* and *Rakthavaha srothas* which can be compared with action of cardio vascular system. *Mula* (roots) of of *Rasavaha srothas* are *Hrdaya* (heart), *Dasha dhamani* (major arteries) and roots of *Rakthavaha srothas* are *Yakruth* (liver) and *Pleeha* (pancreas). (7) '*Shaddharanayoga*' (SD) is a poly herbal Ayurvedic drug formulation commonly used for

*** Corresponding Author:**
Narathota SNL
Temporary Demonstrator,
Unit of Shalya Shalakya,
Institute of Indigenous Medicine
University of Colombo. Sri Lanka.
Email Id: sandalinarathota@ymail.com

hypertensive patients. Even though this drug is used for Hypertension, this hasn't mentioned in Ayurveda authentic texts. SD is indicated for '*Amashayagatha vatha*' in Ayurveda (8) and some texts mention that this drug is used to treat *Maha vyadhi*. *Maha vyadhi* is known as diseases which cannot be cured easily. *Adhi-rakthachapaya* which is caused due to obstruction of normal functions of *vatha dosha* by *kapha dosha* and *medo dhathu*, (7) can be correlated with pathogenesis of hypertensive disorder mentioned in Allopathic medicine. As the name implies, '*Shaddharanayoga*' includes 6 drugs including, '*Chithraka'* – (*Plumbago indica* L./roots of *Rathnitol*), *'Indrayava'* - *Holarrhena pubescens* L./ *Kelindasahal* seeds), '*Pata'* (*Cissampelos pareira* L./ (*Diyamitta* whole plant), *Katuka* (*Picrorhiza scrophulariiflora* Pennell/ *Katukarosana* roots), '*Athivisha'* (*Aconitum heterophyllum* Wall/ *Athividayam* roots) and *'Abhaya'* – (*Terminalia chebula* Retz/ outer cover of *Aralu* fruit). (8) *'Ashtangahrdaya samhitha'* has indicated SD for *Kushta roga* (skin diseases) and *'Darvi'* has been mentioned instead of *Abhaya*. (9) *'Dharana'* means a measuring unit used in Ayurveda medicine. (10)

In modern world, it has been very problematic to treat patients with Hypertension as the treatment protocol mainly aims in controlling BP within healthy ranges rather than eliminating the causative factors. For this purpose, Allopathic treatment mainly tends to prescribe multiple drugs to reduce signs and symptoms of Hypertension (6) and the only option available is to prescribe drugs by increasing the dosage. Ayurveda treatment also has limited number of drugs for Hypertension. Present study mainly focussed to study the literature, physical parameters and effect of SD *Churna* in the management of Hypertension with a case series by prescribing SD *Churna* for patients with Hypertension. Advantages of prescribing this *Churna* were, patients had to use it only for a short period of time (6 days) and practically the patient can use it very easily rather than using *kashaya* preparation. (11)

Materials and methods

Research was conducted by literature study, laboratory tests to analyze physical parameters of SD *Churn*a and clinical survey to analyze the therapeutic effect of "SD *Churna"* in the management of Hypertension (*Adhi rakthachapaya*).

Literature study - was conducted with reference to Ayurveda authentic texts of *Vriddhatraya* (*Charaka Samhitha, Susrutha Samhitha, Ashtangahrdaya Samhitha*), *Laghutraya* (*Madhava Nidana, Sharangadhara Samhitha, Bhava Prakasha*), *Chakradatta*, *Ashtangahrda Sangraha, Bhaisajya Rathnavali, Aushada Sangrahaya* (Ayurveda Pharmacopoeia - vol 1,2,3), Ayurveda *sameekshawa*, Modern medical books and scientific research articles published on internet.

Preparation of SD *Churna* - Drug formula of SD *Churna* was gathered from *Bhava Prakasha* and *Chakradatta*. Ingredients of the preparation include, *Chithraka* (*Plumbago indica* L.), *Indrayava* (*Holarrhena pubescens* L.), *Pata* (*Cissampelos pareira* L.), *Katuka* (*Picrorhiza scrophulariiflora* Pennell), *Athivisha* (*Aconitum heterophyllum* Wall.) and *Abhaya* (*Terminalia chebula* Retz.). Two (2) Liters of fresh milk was used for *Shodhana* (purification) of *Rathnitol*.

Figure 1: Ingredients used in SD *Churna* preparation

Rathnitol - *Plumbago indica* L. | *Kelinda sahal* – *Holarrhena pubescens* L. | *Diyamiththa* – *Cissampelos pareira* L.

Katukarosana – *Picrorhiza scrophulariiflora* Pennell. | *Athividayam* – *Aconitum heterophyllum* Wall. | *Aralu* - *Terminalia chebula* Retz.

Identification and Authentication of raw drugs were done at the Pharmaceutical Botany Division of Bandaranaike Memorial Ayurveda Research Institute. Dried *Rathnitol* roots were purified by boiling with fresh milk for 3 hours and washed with boiled water. Measured 150g from each ingredient, washed, dried and grinded separately. Weighed 120g of each ingredient powder and mixed together. Prepared 120 packets of SD *Churna* each weighing 5g. (7) 12 packets were placed in one pack (60g) to distribute to one patient.

Figure 2: Preparation of *SD Churna*

1.Purification of *Rathnitol* | 2.Washing and drying of ingredients | 3. Weighing ingredients separately

4. Grinding Ingredients | 5. Prepared powder | 6.Measuring 5g of SD *Churna*

7. Packing of SD *Churna* | 8. Prepared & labeled SD *Churna* packets

Laboratory tests – were conducted to find the physical parameters like pH, particle size, moisture content, total Ash value of SD *Churna* and compared the results with Ayurveda *paribhasha* and properties of drug powders.

pH value - Two samples were prepared and pH value was tested by pH analyzer. 5g of SD *Churna* dissolved in 120ml of water and pH value was tested after cooling.

Figure 3: pH value analysis


1.Weighing SD *Churna*


2.Mixing with 120ml of water


3.Filtering the mixture

4.Measuring pH

Particle Size

Sieve shaker machine was used and 50g of SD *Churna* was measured and kept in machine for 5 minutes.

Moisture Content

Drying oven method was used and this is a Thermo-gravimetric method. (Loss on Drying). Three samples were tested. Weight of empty petri dishes were measured initially and 2g of SD *Churna* was added and total weight was recorded. Then kept in oven for 3 hours and let cool in desiccator and measured the weight of three samples. Kept in oven (for another 2 more hours) and repeated the procedure till the weight gets constant.

Figure 4: Moisture content analysis

Total Ash Value

Three trials were done. Measured empty weight of petri dishes and placed 1g of SD *Churna* and measured the total weight. Combustion for 3 hours in Muffle furnace. Checked the colour of Ash and let those cool under desiccator and measured the weight. Repeated the procedure for another 2 hours and calculated the Total Ash Value.

Case series

Study was conducted to analyze the effect of SD *Churna* on management of Hypertension. Ten patients visiting to the OPD of Bandaranaike Memorial Ayurveda Research Institute – Nawinna were selected based on the inclusion and exclusion criteria. Patients of age group 30-70 years, BP ≥ 140/90mmHg and not taking any medications for HTN were included and patients with BP ≥ 180/110mmHg, renal disorders pregnant and lactating mothers were excluded.. Before the study, informed written consent was taken from selected participants and interviewer administered questionnaire was used to gather data on presenting complaint, other complaints and related medical history. One packet (60g) of SD *Churna* was prepared with 12 packets of SD *Churna* each weighing 5g and prescribed for a patient. Advised to dissolve one packet of SD powder (5g) in 120ml of hot water (1/2 *patha*) and keep for 10-15 minutes, filter and take after meal. Two packets should be prepared and take per day after meal b/d (morning and night) for six days. Blood Pressure was checked twice before treatment with a time gap of 30 minutes. Littmann – Classic II S.E. Stethoscope and Mercurial Sphygmomanometer 300mm/Hg manufactured by Matsuoka Meditech Corp was used in this study. On the seventh day, blood pressure was measured twice and mean value was taken and analyzed the data.

Results and Discussion

Results of Literature study

Adhi-rakthachapaya mentioned in Ayurveda can be correlated with Hypertension by considering the pathology of both these diseases. Even though *Adhi-rakthachapaya* is not mentioned as a separate disease in Ayurveda it has been described as malfunctioning of *Rasavaha srothas* and *Rakthavaha srothas* which can be compared with action of cardio vascular system. Ayurveda mentions 13 types of *Srothas* (channels) with their related organs which helps in understanding different diseases and pathogenesis. *Mula* (roots) of *Rasavaha srothas* are *Hrdaya* (heart), *Dasha dhamani* (major arteries) and roots of *Rakthavaha srothas* are *Yakruth* (liver), *Pleeha* (pancreas). (7) Ayurveda has different names for the same drug and some texts have used term '*Shatcharanayoga'* as a synonym for '*Shaddharanayoga'*. (7) Although this drug is commonly used as a *Kashaya* preparation, *Bhava Prakasha* mentions that this can be used as a *Churna* preparation. (8) '*Shaddharanayoga*' is a poly herbal Ayurvedic drug formulation commonly used for hypertensive patients practically and this consists of six herbal ingredients. *Dharana* is a measuring unit of Ayurveda and twenty-one *Nishpava* equal to 1 *dharana*. (9) According to *Susruta Samhita,* in case of *vatha* getting vitiated in stomach, vomiting should be administered in the stipulated procedure followed by use of *Shaddharanayoga* with lukewarm water for seven days. Combination of *chithraka, indrayava, pata, katuka, athivisha, abhaya/harithaki* is known as *Shaddharanayoga* and used to alleviate *vathika* diseases. (7) Six *dharanas* are known as *Shaddharana* and one *dharana* equals to 750 mg. *Ashtanga samgraha* (9) mentions *Shaddharanayoga* with *Darvi* instead of *Abhaya* and *Bhaisajja Rathnavali* (12) mentions *Vibhitaka* for *Abhaya*. Both these texts mention that SD should be taken as decoction for seven days and indicated for the treatment of *Maha roga* (Diseases that are difficult to cure).

Bhava Prakasha mentions *Churna* can be taken for 6 days in dosage of 1 *Karsha* per day, after emesis or else this can be taken as 6 separate *Churna* for 6 days

without doing emesis. As the text mention both these *Churna* should be taken with lukewarm water. (8) *Susrutha Samhitha, Bhava Prakasha, Chakradattha* mention same ingredients. According to *Bhava Prakasha* there are two varieties of *mana paribhasha* as *Magadha mana* and *Kalinga mana*. *Kalinga mana* was used to prescribe drugs for the patients. Hence ½ *karsha* was used twice a day. According to the *Bhava Prakasha,* powder of *chitraka, indrayava, pata, katuka, athivisha*, and *abhaya* consumed with warm water is best for v*atha* lodged in *Amashaya.* In this formula the quantity of each drug should be six *dharana* (3/4 grams). This recipe should be used for six days hence this is known as *Shaddharanayoga*. (8)

SD is one of the famous Ayurvedic preparations which is used for Hypertension in common practice. (11) Although there is no indication for Hypertension in main authentic texts, certain scholars have attempted to correlate Hypertension with *Adhi-rakthachapaya*. Hypertension can be assumed as *raktagata vatha*, *siragata vatha*, *pittavruta vatha*, *pranavruta-udana vatha*, *pittavruta-udana vatha* and *pittavruta-vyana vatha*. (13) Cholesterol plays a part of *medo dhatu* metabolism. Seven *dhatus* including *medo dhatu* is generated from metabolized nutrient parts of foods we take. They are individually generated from the previous *dhatus* with the help of corresponding *dhatwagni* (metabolic fire in tissues). With the etiological factors *dhathwagni* will be altered qualitatively and quantitatively. *Medo dhatu* will lead to excessive formation of cholesterol, triglycerides etc. This results in accumulation of *medas* in blood vessels (*Dhamani prathichaya*) due to *vatha avarodha* with predominance of *kleda* and *prthvi*. (13)

Analysis of Ayurveda Pharmacological properties (*Rasadi panchakaya*) revealed that (83.33%) *Thiktha rasa* (bitter taste), (83.33%) *Laghu guna* (light property), (66.67%) *Ushna veerya* (hot potency) and (83.33%) *Katu vipaka* (pungent final digestive transformation) were the main properties of *Shaddharanayoga*. No *Prabhava* (special potency) was recorded in these ingredients. (14) These properties act on normalizing *Pachaka pitha* by *Agni deepana* and *Ama pachana* resulting pacification of vitiated *Kledhaka*, *Avalambahaka kapha* and reducing the *Athi-pravruththi* of *Medo dhathu*. According to Ayurveda, *Dhathu kshaya* (depletion of tissues) and *Marga avarodha* (obstruction of channels) result in *vatha kopa*. Effect of *Shaddharanayoga* on *Pachaka pitha*, *Kledhaka kapha, Avalambhaka kapha* and *Medo dhathu* normalize the action of *Vyana vatha* and reduce the risk of pathogenesis of *Adhi-rakthachapaya*. (14)

Table 1: Pharmacological analysis of ingredients of SD *Churna*

Ingredient		**Used Parts**	***Rasa***	***Guna***	***Veerya***	***Vipaka***
Botanical name, Family, Common name	**Sanskrit & Sinhala name**					
1.Plumbago indica L. Plumbaginaceae -Leadwort	*-Chitraka/ Anala -Rathnitol*	Roots	*Katu*	*Laghu Ruksha, Theekshna*	*Ushna*	*Katu*
2. Holarrhena pubescens L. Apocynaceae -Conessi tree	*-Kutaja/ Kalinga -Kelindahal*	Seeds	*Thiktha, Kashaya*	*Laghu Ruksha,*	*Sheetha*	*Katu*
3. Cissampelos pareira L. Menispermaceae -Velvet leaf	*-Pata/ Ambhasta -Diyamitta*	Whole plant	*Thiktha,*	*Laghu Theekshna*	*Ushna*	*Katu*
4. Picrorhiza scrophulariiflora Pennell Scrophulariaceae -Yellow gentian	*-Katuka/ Thiktha -Katukarosana*	Stem	*Thiktha,*	*Theekshna*	*Sheetha*	*Katu*
5. Aconitum heterophyllum Wall. Ranunculaceae -Aconite	*-Visa/ Athivisa -Athividayan*	Roots	*Katu, Thiktha*	*Laghu, Ruksha,*	*Ushna*	*Katu*
6. Terminalia chebula Retz. Combretaceae -Chebulic myrobalan	*-Harithaki/ Abhaya -Aralu*	Fruit	*Shad rasa* except *Lavana*	*Laghu, Ruksha,*	*Ushna*	*Madhura*

Relationship of properties of *Shaddharanayoga* ingredients with *Dosha, Dhathu* and *Agni* of human body can be explained as follows. *Dosha* involved in pathogenesis of *Adhi-rakthachapaya* are *Pachaka pitha, Sadhaka pitha*, *Kledhaka kapha, Avalambhaka kapha*, *Vyana vatha* and involved *Dhathu* is *Medo dhathu*. Overall effect can be considered as *Agni deepana*, *Ama pachana* effect of *Shaddharanayoga* helps in reducing *Medo vruddhi* by avoiding *Marga Avarodha* and normalize *Gathi* (movement) of *Vatha dosha*. (7) Literature analysis showed that 66.67% of ingredients had the ability of mitigating *Vatha* and *Kapha* and 83.3% of the ingredients are digestive and can increase the digestive fire (*Agni*).

Physical parameters of SD *Churna*

Organoleptic properties - Evaluation by means of sense organs is known as organoleptic properties. (15) SD *Churna* was a moderately coarse powder, beige colour with pungent smell and taste.

pH value – SD *Churna* was Acidic with sample one having pH of 4.74 (RT – 28.8^{0}C) and sample two having pH of 4.53 (RT – 28.3^{0}C).

Particle size - 45% of *Churna* belonged to moderately coarse powder category which can be used as "*Phanta*" preparation mentioned in Ayurveda "*Phanta paribhasha"* (Dissolved in hot water and filter and take)**.** Equation used to calculate particle size was,

$$\text{Particle Size} = \left[\frac{\text{Weight of powder (g)}}{\text{Sample weight used (g)}}\right] \text{X } 100$$

Moisture content –
Moisture content of sample one was 0.2817%, sample two was 0.2697% and sample three was 0.2664%. With these results it was cleared that the shelf life of SD *Churna* will be approximately 2-3 months. (16)

$$\textit{Moisture content} = \left\{\frac{(\textit{Initial weight } (X) - \textit{Weight after 5 hours})}{\textit{Initial weight}}\right\} * 100\%$$

Total Ash value –
Three trials were conducted and equation used to calculate Total Ash value (Y) was,

$$\text{Total Ash value (Y)} = \left\{\frac{\text{Weight of Ash}}{\text{Initial weight of sample}}\right\} * 100\%$$

Ash value of the three samples of SD *Churna*

Sample 1	2.8485%
Sample 2	2.9487%
Sample 3	2.7339%

Figure 5: Total Ash value analysis

Results of Case Series used to analyze the therapeutic effect of *SD Churna*

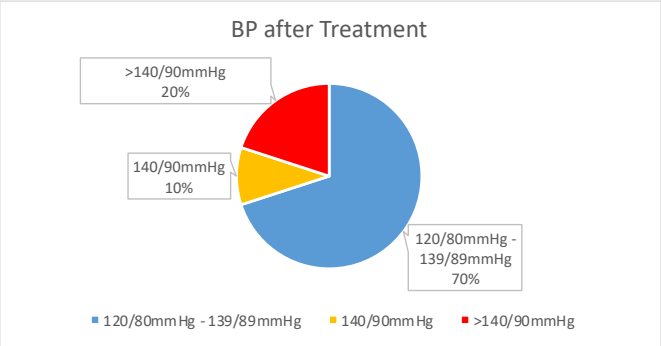
Among the selected patients, 70% were present with joint disorders, 20% with headache and 10% with numbness of legs. Moreover, reduced appetite, constipation, difficulty in breathing, dizziness, vomiting, flatulence, tiredness, body ache and reduced sleep was presented as other complaints. Prescribed SD *Churna* for these patients as an internal medicine for six days morning and night after meal (one packet dissolved in hot water, filter and take). No any other internal medicines prescribed other than the external medicines for presenting complaints of patients.

Table 2: Therapeutic effect of SD *Churna* on Blood Pressure of patients

Serial Number	BP before treatment	BP after treatment			
		Reduced		Not changed	Increased
		BP< 140/90 mmHg	BP≥ 140/90 mmHg		
1	140/90 mmHg	130/80 mmHg	-		-
2	160/90 mmHg	136/90 mmHg	-		-
3	140/90 mmHg	130/90 mmHg	-		-
4	150/90 mmHg	-	-	150/90mmHg	-
5	140/90 mmHg	130/80 mmHg	-		-
6	140/100 mmHg	120/80 mmHg	-		-
7	150/100 mmHg	130/90 mmHg	-		-
8	160/100 mmHg	-	140/90 mmHg		-
9	170/100 mmHg	-	160/90 mmHg		-
10	150/90 mmHg	136/80 mmHg	-		-

It was cleared that the SD *Churna* had an effect on reducing blood pressure of patients. Seven patients showed reduced BP compared to initial blood pressure and two patients (SN - 8,9) with mild reduction of blood pressure range. One patient (SN – 4) showed no any change in blood pressure before and after treatment. Overall result was, after the treatment with SD *Churna* for six days 70% of patients showed reduction in BP. This gives an idea about the positive effect of SD *Churna* in the management of blood pressure to a normal level.

Figure 6: BP after Treatment



Before the treatment, patients were having other complaints as reduced appetite, flatulence, vomiting, dizziness, headache, constipation and difficulty in breathing. After intake of SD *Churna* for six days it was recorded that most of these complaints like reduced appetite, constipation, flatulence and difficulty in breathing had reduced along with the reduction of blood pressure. These results proved the success rate of

indications mentioned in authentic texts for SD *Churna* such as pacifying vitiated *Vatha dosha* in abdominal diseases (*Amashayagatha vatha)*. By the data collected from interviewer administered questionnaires in the study, it was cleared that risk factors for this disease condition (*Adhi-rakthachapaya*) were positive family history of HTN, mental stress, over- weight (increased BMI), unhealthy food patterns like intake of oily food, Alcohol consumption in males, use of hormonal tablets by females and high cholesterol levels which marked higher influence on blood pressure of patients.

Discussion

According to Ayurveda literature, it was cleared that *Adhi – rakthachapaya* can be considered as a disease condition caused mainly due to 2 main factors. They are *Sanga* (obstruction of the channel) and *Athi-pravrutthi* (excess flow of *dosha* and *dhathu* in the channel). Vitiation of *Kapha dosha* and excess accumulation of *medo dhathu* can be considered as the cause for obstruction of *Srothas* and excessive flow of blood (*Raktha dhathu*) which is due to vitiation of *Vatha dosha* can be related to *Athi-pravrutthi* in *Adhi-rakthachapaya.* Pharmacological properties of these six ingredients revealed the presence of 83.33% *Thiktha rasa* (bitter taste), 83.33% *Laghu guna* (light property), 66.67% *Ushna veerya* (hot potency) and 83.33% *Katu vipaka* (pungent final digestive transformation) which helps in pacifying the vitiated *kapha* and *vatha dosha* which are the two main *doshas* responsible for the pathogenesis of *Adhi – rakthachapaya.*

In detail, *Thiktha rasa* (bitter taste), *Laghu guna* (light property), *Katu vipaka* (pungent final digestive transformation) are opposite properties of *Kapha dosha* and *Ushna veerya* (hot potency) is opposite to properties of both *Vatha and Kapha dosha.* These findings can be used to develop the therapeutic importance of SD in treating *Adhi – rakthachapaya* and as directly mentioned in the literature, these properties help in treating *Amashayagatha vatha* (disease conditions of stomach). Diseases pertaining to *Amashayagatha vatha* occurs with *Ama* which develops due to malfunction of *Jataragni* (digestive fire) caused due to vitiated *Kapha dosha* and conditions like pain, flatulence, fullness of abdomen occurs due to the vitiation of *Vatha dosha.* With the use of *Daru haridra* instead of *Abhaya, Shaddharanayoga* can also be used for skin diseases as well.

By considering the Ayurveda literature, it was cleared that SD can be used in powder form as well. Use of powder form is relatively easier for patients even though it cannot give the maximum therapeutic effect as the *Kashaya* (decoction). By the laboratory tests to analyze the physiological properties it was cleared that this was a moderately coarse powder which can be used in *Phanta* form with an approximate shelf life of 2-3 months. pH was acidic and this also helps in comparing the positive effects of SD on abdominal diseases. Case series conducted with ten selected patients based on inclusion and exclusion criteria gave positive results in reducing the BP levels. 70% of the patients showed reduced BP which lies in the healthy BP level. 20% showed reduced BP but those two results were not in the normal BP level. Only one patient showed no change in BP level from the initial level. All these patients showed positive results in recovery of other complaints such as loss of appetite, flatulence, constipation, difficulty in breathing and headache. These positive results were gained by the use of SD *Churna* only for six days and continuous usage may increase the healthy outcome. By this preliminary study it was cleared that the polyherbal drug formulations SD *Churna* can be used for abdominal diseases as well as for *Adhi-rakthachapaya* (Hypertension).

Conclusion

- It was cleared that the ingredients of SD *Churna* can act on pacifying vitiated *Kapha, Vatha dosha*, reducing *Medo vriddhi* and normalizing the factors related to *Adhi-rakthachapaya* and *Amashayagatha vatha.*
- pH of *Phanta* prepared from SD *Churna* was Acidic, particle size of SD *Churna* was moderately coarse and the results of moisture content analysis showed that the shelf life of powder will be approximately 2-3 months which is compatible with the shelf life mentioned in *Churna paribhasha* of Ayurveda.
- Case series showed reduction of blood pressure and other complaints such as flatulence, difficulty in breathing, loss of appetite, constipation in the patients of the study.

Future suggestions

More clinical trials like randomized control trials will be conducted to find the effectiveness of SD *Churna* in management of *Adhi-rakthachapaya* (HTN). Comparative study to analyze the efficacy of *Kashaya, Phanta* and *Churna* of SD formulation along with the standardization and chemical analysis on *Shaddharanayoga* will be carried out in future.

References

1. *Panditha Aryadaasa kumarasinghe*, Sinhala translation of *Charaka Samhitha* of Acharya *Charaka,* Department of Ayurveda – Sri Lanka; 1991; Part 1, 12p, 13p
2. https://www.who.int/health-topics/Hypertension#tab=tab_1 dated 06-08-2021 time 10:20 SLST
3. https://www.cdc.gov/bloodpressure/about.html dated 06-08-2021 time 10:45 SLST
4. https://www.heartfoundation.org.au/heart-health-education/blood-pressure-and-your-heart dated 06-08-2021 time 11:30 SLST
5. https://www.heart.org/en/health-topics/high-blood-pressure/health-threats-from-high-blood-pressure dated 07-08-2021 time 21:10 SLST
6. https://www.healthline.com/health/high-blood-pressure-Hypertension/blood-pressure-reading-explained dated 06-08-2021 time 20:30 SLST

7. Singhal GD & colleagues, *Susrutha samhitha* of Acharya *Susrutha,* Chowkhamba Sanskrit Pratishthan, Delhi; 2015; Volume II, 195p
8. Buddhadasa, Sinhala translation of *Acharya Bhavamisra's Bhava Prakasha,* 1st edition, Department of Ayurveda – Sri Lanka; 1982; Volume 2 *(Madhyama Khanda* II) 243p – 245p
9. Srikantha Murthy KR, Ashtanga Sangraha of Acharya *Vagbhata*, Chowkhamba Orientalia, Varanasi; 2002; Volume II, *Chikithsa sthana*, 21/42
10. Buddhadasa R, Sinhala translation of Acharya *Bhavamisra's Bhava Prakasha,* 1st edition, Department of Ayurveda – Sri Lanka; 1981; Volume 1 *(Purva khanda* II), 405p – 407p, 410p
11. *Ayurveda Sameekshaawa* - A publication of Ayurveda Education Bureau, Department of Ayurveda – Sri Lanka; 2008; Volume II (Part IV), 202p – 204p
12. Kanjiv Lochan, English translation of Govinda Dasji Bhisagratna of *Bhaisajya Rathnavali*, Chowkhamba Sanskrit Sansthan, Varanasi; 2006; Volume II, 129p
13. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6314241/ dated 08-08-2021 time 09:30 SLST
14. Ayurveda Pharmacopoeia, Department of Ayurveda – Sri Lanka; 1976, Volume III, II, I, 170p, 171p
15. https://www.cognibrain.com/parameters-research-preformulation-studies/ dated 10-08-2021 time 10:40 SLST
16. https://www.researchgate.net/publication/270286996 dated 10-08-2021 time 13:20 SLST

*****