WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 9, Issue 8, 1466-1483. Research Article ISSN 2277– 7105

A COMPARATIVE STUDY BETWEEN LEKHAN BASTI AND SHATKARMA (SHANKHAPRAKSHALAN, KUNJAL) IN THE MANAGEMENT OF STHAULYA

Shagun Chaudhary*[1], Ketan Mahajan[2] and Piyush Gupta[3]

[1]MD Scholar, P.G. Dept. of Panchakarma; Patanjali Ayurvigyan Evam Anusandhan Sansthan, Haridwar, Uttarakhand, India.

[2,3]Associate Professor, P.G. Dept. of Panchakarma; Patanjali Ayurvigyan Evam Anusandhan Sansthan, Shanteshah Haridwar, Uttarakhand, India.

Article Received on
29 May 2020,

Revised on 19 June 2020,
Accepted on 09 July 2020

DOI: 10.20959/wjpr20208-18081

***Corresponding Author**
Dr. Shagun Chaudhary
MD Scholar, P.G. Dept. of Panchakarma; Patanjali Ayurvigyan Evam Anusandhan Sansthan, Haridwar, Uttarakhand, India.

ABSTRACT

Shifting patterns of diet and lifestyle is resulting in rise of non-communicable disease. Obesity is one among of them. Obesity has become epidemic today and serve threat to healthy and longevity. It is the consequence of intake of energy exceeding its expenditure over a considerable period. *Ayurveda* describes the basic and applied aspects of life process, health, disease and its management in terms of its own principles and approaches. *Sthaulya* has been described since very early days in various *Samhitas*, *Sangraha Granthas* etc. Total 50 patients having BMI >25 Kg/m^2 of any socio-economic status, age group of 16-50 years and irrespective of sex of all ethnic origins were randomly selected. *Lekhan Basti* was administered as per *Yoga Basti* schedule of 8 days in one group and *Shankha prakshalan* followed by *kunjal* for one day in other group with follow up of *lekhaniye mahakashaya kwath* for 30 days. Assessment was done on subjective and objective parameters and obtained data was analyzed using appropriated statistical tests and concluded that there was significant difference in both groups of *Sthaulya.*

KEYWORDS: *Sthaulya, Lekhan Basti, Shatkarma, Lekhaniye Mahakashaya.*

INTRODUCTION

The term *Sthaulya*, derived from the root *'Sthula Brimhane'* with an addition of *Ach Pratyaya*. In combination with reduced physical activity, energy dense food, overeating,

sleeping during day time, sedentary lifestyles have led to alarming increase in the incidence of overweight. Excessive and abnormal increase of *Meda* along with *Mamsa Dhatu* results into pendulous appearance of *Sphika, Udara* and *Stana*. *Ayurveda* has described *Atisthula* person in *Ashtaunindita Purushasi*.[1] It is also mentioned as disorder of *Sleshma Nanatmaj*[2] *Santarpana Nimitaja*[3], *Ati Brimhana Nimitaja*[4] *and Samsodhana Yogya.*[5] Frequent and excess intake of *Kapha* increasing factors are the most common etiological factors. *Sthaulya* also has a hereditary cause as it occur due to *Beejadoshas.*[6] *Acharya Sushruta* mentioned the *ahara ras* as a causative factor of *Sthaulya and Karshya*[7] *Sanga* in *Medovaha Srotas* the nutrients cannot be carried by *Vyana Vayu* to their respective *Dhatu* and again excess intake of *Medo poshaka Ahara, Meda Vriddhi and Kshya* of *Uttar Dhatu* takes place. In *Sthaulya* due to obstruction of *Meda, Vata* remain in the *Kostha* and causes *Tikshnagni*. Due to *tikshnagni*, person goes for *Adhyasana* and *Kalavyatita Ahara Sevan*, which leads to disturbance in *Agni,* and subsequently formation of *Ama* may take place. *Acharya Charaka* explained the *Chikitsa Sidhanta* for *Sthaulya* as *'Guru Ch Aptarpan'*.[8] According to *Acharya Vagbhata, Aptarpana* is of two types- *Shodhana and Shamana*[9] and *Basti Chikitsa* comes under *Shodhana.*[10] According to *Sharangadhara, Lekhan* is a drying up of all excess *Dosha, Dhatu and Mala.*[11] *Acharya Charaka* explained about *Lekhaniye Mahakashaya.*[12] The drugs of *Lekhana Basti* have dominance of *Katu-Tikta-Kashaya Rasa, Laghu-Tikshna-Shukshma Guna,Ushna Virya* and *Katu Vipaka. Katu, Tikta, Kashaya Rasa* reduces *Kleda* which leads to wasting of all the *Dhatus*, result as emaciation. In *Hatha Pradeepika, Shatkarma* is mentioned for increased *Medha* and *Sleshma*[13] And *Dhauti Karma* is effective for twenty type of *Kapha Roga.*[14] When the vitiation of *Dosha* is less, *Shamana* therapy can easily pacify it. So to pacify the remaining *Dosha* after *Lekhan Basti* and *Shatkarma, Shamana* therapy is given in the form of *Lekhaniye mahakashaya kwath.*

AIMS AND OBJECTIVES

- To assess the effect of *Lekhan Basti* in *Sthaulya* and *Samyak Basti Lakshana*.
- To assess the effect of *Shatkarma (Shankhaprakshalan, Kunjal)* in the management of *Sthaulya*.
- To compare the *Lekhan Basti* and *Shatkarma (Shankhaprakshalan, Kunjal)* in the management of *Sthaulya.*

MATERIAL AND METHOD

The study includes a sample size of 50 patients of *Sthaulya* attending the OPD & IPD of Patanjali Bhartiya Ayurvigyan Avum Anusandhan Sansthan, Haridwar, Uttarakhand. The study was carried out in patients having BMI more than 25 after taking informed consent and permission being obtained from institutional ethics committee.

Total no. of patients= 50

Type of study= Single blind clinical study.

Level of study= O.P.D and I.P.D level.

Period of study= 18 months.

Diagnostic criteria

Patients with cardinal sign and symptoms of *Sthaulya* are taken for the study.

Inclusion criteria

- Age- 15-60 yr.
- Both male and female.
- Patients with BMI more than 25.
- Patient having clinical sign and symptom of *Sthaulya.*
- Patient fit for *Basti* procedure.

Exclusion criteria

- Age below 15 and above 60 yr.
- Patient unfit for *Basti.*
- Pregnant and lactating mother.
- Any systemic disorder which may interfere in the course of treatment

Assessment criteria

- *Nirgaman Kaal* of *Basti.*
- *Samayak Lakshan* of the procedure.
- *Ayoga* and *Atiyoga Lakshan* of *Basti.*
- Assessment with regards to improvement recorded in clinical findings and laboratory investigations.
- Changes observed in sign and symptoms assessed by subjective and objective signs by using appropriate clinical tools.

Subjective criteria

The main sign and symptom of *Sthaulya d*escribed in *Ayurveda - Utsahahani, Daurbalya, Daurgandhya, Swedabadha, Kshudhatimatra, Pipasatiyoya* are considered under the subjective criteria and percentage relief has been taken to assess the efficacy of therapy.

Objective criteria

- Body weight
- BMI (Quetlet's Index)[15]
- Skin fold thickness
- Waist circumference
- Mid Arm Circumference
- Mid Thigh Circumference
- Waist Hip ratio

Research design

- It is a randomized open labelled clinical study. Patients were assigned in two groups each comprising 25 patients.
- **Group A-** *Lekhan Basti*[16](768 ml) and *Triphaladi taila* (190ml) was administered as per *Yoga Basti*[17] schedule after *Sthanika Abhyanga* (abdomen, low back, thighs and buttock) with *Triphaladi Taila, Nadi Swedan, Poorvakarma.*

1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day
A	A	N	A	N	A	N	A

- **Group B-** *Shankha prakshalan* followed by *Kunjal.* These practices were done for one day. After completion of course of treatment all the patients were prescribed with *Lekhaniye Mahakashaya Dravya Kwath* 50 ml B.D dose before meal for next 30 days for follow up study. Patients were followed at the intervals of 30 days.

Method of collection of drug

The drugs used for procedures were obtained from *Divya* Pharmacy of *Patanjali Bhartiya Ayurvigyan Avum Anusandhan Sansthan* and raw drugs for *Lekhan Mahakashaya* were obtained from *Hans* Pharmacy, *Haridwar*, Uttarakhand.

Method of preparation of *lekhan basti*

To prepare *Niruha Basti*, the contents of it are mixed in a particular fashion as mentioned in classics i.e. initially 120 ml *Makshika* and 10gms of *Saindhava Lavana* are taken in a *Khalva yantra* and mixed homogenously, after that 190 ml of *Triphaladi Taila* is taken and is mixed to form uniform mixture, there after 25gms of *Kalka (Hingu. Kasis, Sheelajit, Neeltutha, Yavakshara)* each 5 gm made of fine *Choorna*'s is added to above mixture. It is followed by the mixing of 250 ml of *Kwatha Dravya* prepared with *Kwatha Choorna's* of *Triphala*. Finally 100 ml of *Gomutra* is added and mixed thoroughly to form a homogenous mixture and tested for *Suyojita Niruha Lakshana's.* Now the whole of the *Basti Drava* is filtered and it is administered after making it lukewarm indirectly by heating in the vessel of water. The particular pattern of mixing the *Basti Dravya* is followed so that all the contents are mixed properly and finally a uniform mixture is obtained.

Method of preparation of fennel fruit water for shatkarma

Hands should be washed and nails should be well trimmed. Fennel fruit water was prepared by boiling two teaspoonfuls of fennel fruit in two litre water. For *Shatkarma* procedures, lukewarm fennel fruit water was used. It was advised to have only a light meal before undertaking this practice. On the day of *Shatkarma* avoid practising *Asanas* in the morning and do not take food or beverages before the procedure. Light, loose comfortable clothing should be worn during the practice. Prepare a bucket of clean lukewarm fennel fruit water.

Two teaspoons of salt per litre was added to water so that it tastes mildly salty.

Shankha prakshalan

Technique

Two glasses of lukewarm salty water was drinked by patient as quickly as possible. Next, the following five *Asanas* were performed dynamically eight times each in this sequence: *Tadasana, Triyak Tadasana, Katichakrasana, Triyakbhujangasana and Udarkarshanasana*.[18] Drinking water and performing the *Asanas* was done continuously until clear water was expelled. When clear water started to come, the practice was stopped. On average between 16 and 20 glasses of prepared water were required to complete the practice, but it varied from person to person.

After completing the practice it was essential to rest completely in *shavasana* for 45 minutes. This allows the whole digestive system to revitalize itself following the expulsion of

impurities. It was important to having light meal after *Shankhaprakshalan* so that there was no extra load on the digestive system. It must not be performed during extremely cold or extremely hot weather, nor during cloudy, windy or rainy weather. The actual practice was completed in two to three hours.

Kunjal kriya

Technique

After standing straight, atleast six glasses of the prepared water was drinked quickly, one after the other, until the stomach cannot hold any more. On average, six glasses were sufficient to fill the stomach completely. When the stomach get full, the urge to vomit will come automatically. Lean forward, keeping the trunk parallel to the ground. Open the mouth and place the middle and index fingers of the right hand as far back on the tongue as possible. Back of the tongue was gently rubbed and pressed by moving fingers slowly forward and backward. Then the water expelled without further effort. During the expulsion of water the fingers were removed from the mouth and the process was repeated until the stomach completely emptied.

OBSERVATION

Gender- 58% were female and 42% were male.

Age- 50% patients belong to the age group between 31-45 years followed by 42% in the age group of 15-30 years and 8% patients in the age group of 46-60 years.

Marital status- 66% patients were married and 34% were unmarried.

Religion- Patients 96% patients belong to the Hindu religion and 4% belong to other religion.

Occupation- 28% patients were housewives, 24% patients were students, 18% were businessman, and 30% were doing service.

Education - Maximum 56% patients were graduate, 18% were post graduate, 16% patients were taking education up to matric and 10% patients were either illiterate or high secondary educated.

Economical status- 78% patients were of middle class and 22% were rich.

Onset- Gradual onset of the disease was found in 68% patients, 18% patients had sudden onset while 14% were having insidious onset of the disease.

Chronicity- 38% were suffering from 1-2 years and 38% patients were from 3-4 years. 24% patients were having disease from 5 or more than 5 years.

Appetite- 56% of the patients had shown moderate appetite and 34% patients were having good appetite and 10% patients were having poor appetite.

Diet- 62% patients were taking vegetarian diet and 38% were taking mixed diet.

Dominance of *rasa*- Maximum numbers of the patient i.e. 56% was having *Madhur Rasa* in their routine diet followed by *Katu Rasa* in 30% patients and *lavan Rasa* in 14% patients.

Dietery habit- 42% patients were taking *Samasana* type of dietary habit, 34% patients were taking and 24% were taking *Adhyasana*.

Sleep- Maximum number of patients i.e. 60% was having sound sleep and 26% patients were having good sleep and sleep was disturbed in 12% patients and 2% were having delayed sleep.

Agni- Maximum numbers of patients i.e. *38% were having Tikshnagni*, 26% patients were having *Mandagni*, 22% patients were having *Vishamagni* and *14% were having Samagni*.

Kostha- 68% patients were having *Mridu Kostha*. 16% patients were having each *Madhyam* and *Krura Kostha*.

Deha prakriti- *Kapha-pittaj prakriti* patients were 44%, *Vatapittakaphaj prakriti* patients were 34% and *Vata-kaphaj Prakriti* patients were 14%, *Vata-pittaj prakriti* patients were 8% found in the study.

Physical exercise- 54% were not performing any physical exercise, 34% were irregular and6% were performing each regular and less physical exercise.

Fat distribution- 52% patients were having generalised fat distribution, 30% were having central fat distribution, 14% was having girdle fat distribution and 4% were having inferior type of fat distribution.

Body weight- 38% patients were having body weight in 75-84.9 range then 32% in 85-94.9, 16% in 65-74.9 range, 6% in 95-104.9 range , 4% in 115-124.9 range and 2% in each 55-64.9 and 105-114.9 range.

BMI- BMI of 44% patients in the range of 24-29.9, 36% were in 30-34.9 range, 12% in 35-39.9 and 8% were in 40-44.9 range of BMI.

Skinfold thickness- Skinfold thickness of lower abdomen in 46% patients was found in the range of 5-5.9, 34% in 4-4.9 range, 14% were having in 6-6.9 range and 3-3.9 in 4% patients.

Waist circumference- 56% patients were having waist circumference in between 95-104.9, 22% were having 105-114.9 and 12% having 115-124.9, 8% having 85-94.9 and 2% were having 125-134.9.

Waist-hip ratio- 52% was found to have waist-hip ratio in 0.95-1 range, then 26% in 0.9-0.94 range, 18% in 0.85-0.89 range and 4% in 0.80-0.84.

Right Mid-arm circumference-Right Mid-arm circumference of patients were evaluated by making the particular range of measurements which reveals that 40% patients was in 36-38.9 range, 30% were in 33-35.9, 22% in 39-40 range and 8% in 30-32.9.

Left Mid-arm circumference- 36% patients were in 33-35.9 range, 34% were in 36-38.9, 22% in 39-40 range and 8% in 30-32.9 range.

Right Mid-thigh circumference- 44% patients were having right mid-thigh circumference in 55-59.9 range, 32% in 60-64.9, 12% in 65-69.9, 10% in 50-54.9 range and 2% in 70-75 range.

Left Mid-thigh circumference- 42% patients was having circumference of left mid-thigh in the range of 55-59.9, 32% in 60-64.4range, 12% in each 50-54.9 and 65-69.9, 2% in 70-74.9 range.

Effect of therapies

Total 50 patients were registered for treatment with 25 patients in each group. The effect of the therapy was assessed in both the groups with common parameters before and after completion of treatment.

Subjective parameters

Group A.

Table 1.

Symptom	Mean		Mean Diff.	SD	SE	't'	P	Result
	BT	AT						
Utsahahani	1.36	0.24	1.12	0.73	0.15	7.72	<0.001	Sig
Daurbalyata	1.72	0.76	0.96	0.61	0.12	7.86	<0.001	Sig
Daurgandhta	0.44	0.16	0.28	0.46	0.09	3.06	0.005	NS
Atipipasa	2.32	1.20	1.12	0.53	0.11	10.65	<0.001	Sig
Atikshudha	2.80	2.00	0.8	0.65	0.13	6.2	<0.001	Sig
Swedahikya	1.64	0.64	1.0	0.91	0.18	5.48	<0.001	Sig

The total effect of therapy on symptoms of each patient was evaluated before and after completion of the treatment. The initial mean score of 25 patients in *Utsahahani*, the mean before treatment was 1.36 which was reduced to 0.24 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with't' value of 7.72. In *Daurbalyata*, the mean before treatment was 1.72 which was reduced to 0.76 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with't' value of 7.82. In *Daurgandhta*, the mean before treatment was 0.44 which was reduced to 0.16 after treatment. The total effect of treatment provided (P=0.005) result with't' value of 3.06. In

Atipipasa, the mean before treatment was 2.32 which was reduced to 1.20 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with‘t’ value of 10.65. In *Atikshudha*, the mean before treatment was 2.8 which was reduced to 2 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with‘t’ value of 6.2. In *Swedadhikya*, the mean before treatment was 1.64 which was reduced to 0.64 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with‘t’ value of 5.48.

Group B.

Table 2.

Symptom	Mean		Mean Diff.	SD	SE	‘t’	P	Result
	BT	AT						
Utsahahani	1.48	0.64	0.84	0.55	0.11	7.58	<0.001	Sig
Daurbalyata	1.72	0.64	1.08	0.49	0.1	10.95	<0.001	Sig
Daurgandhta	0.48	0.16	0.32	0.48	0.1	3.36	0.002	NS
Atipipasa	2.12	0.84	1.28	0.68	0.14	9.44	<0.001	Sig
Atikshudha	2.80	1.88	0.92	0.49	0.1	9.33	<0.001	Sig
Swedahikya	1.64	0.76	0.88	0.78	0.16	5.63	<0.001	Sig

The total effect of therapy on symptoms of each patient was evaluated before and after completion of the treatment. The initial mean score of 25 patients in *Utsahahani*, the mean before treatment was 1.48 which was reduced to 0.64 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with‘t’ value of 7.58. In *Daurbalyata*, the mean before treatment was 1.72 which was reduced to 0.64 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with‘t’ value of 10.95. In *Daurgandhta*, the mean before treatment was 0.48 which was reduced to 0.46 after treatment. The total effect of treatment provided statistical non significant (P=0.002) result with‘t’ value of 3.36. In *Atipipasa*, the mean before treatment was 2.12 which was reduced to 0.84 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with‘t’ value of 9.44. In *Atikshudha*, the mean before treatment was 2.80 which was reduced to 1.88 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with‘t’ value of 9.33. In *Swedadhikya*, the mean before treatment was 1.64 which was reduced to 0.76 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with‘t’ value of 5.63.

The total effect of treatment on symptoms of each patient of both groups was evaluated before and after completion of the treatment. The total effect of treatment provided statistical

significant result in *Utsahahani, Daubalyata, Atipipasa, Atikshudha, Swedhahikya* in both groups and non-significant results in the symptom *Daurgandhta* in both the groups.

Objective parameters

Group A.

Table 3.

Parameters	Mean		Mean Diff.	SD	SE	't'	P	Result
	BT	AT						
Body Weight	86.10	81.28	4.82	1.67	0.33	14.45	<0.001	Sig
BMI	32.39	30.66	1.73	0.57	0.11	15.15	<0.001	Sig
Skin fold thickness	5.15	4.62	0.53	0.32	0.06	8.35	<0.001	Sig
Waist circumference	105.5	101.4	4.1	2.73	0.55	7.51	<0.001	Sig
Waist-hip ratio	0.95	0.93	0.02	0.02	0.00	4.26	0.003	Sig
Mid arm circumference Right	36.10	34.26	1.84	1.16	0.23	7.92	<0.001	Sig
Mid arm circumference Left	35.96	34.28	1.68	1.2	0.24	7.01	<0.001	Sig
Mid thigh circumference Right	60.72	58.44	2.28	1.34	0.27	8.51	<0.001	Sig
Mid thigh circumference Left	60.72	58.48	2.24	1.2	0.24	9.33	<0.001	Sig

The total effect of therapy on symptoms of each patient was evaluated before and after completion of the treatment. The initial mean score of 25 patients for Body Weight was 86.10 which were reduced to 81.28 after treatment .The total effect of treatment provided statistical significant (P<0.001) result with 't' value of 14.45. For BMI, the mean before treatment was 32.39 which was reduced to 30.66, exhibiting highly significant (P<0.001) improvement with't' value of 15.15. For skinfold thickness, the mean before treatment was 5.15 which was reduced to 4.62 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with't' value of 8.35. For Waist circumference, the mean before treatment was 105.5 which was reduced to 101.4, exhibiting highly significant (P<0.001) improvement with't' value of 7.51.The initial mean score of Waist-hip ratio was 0.95 which was reduced to 0.93. The treatment provided statistical not significant (P=0.003) result with't' value of 4.26. The initial mean score for Right mid-arm circumference was 36.1 which were reduced to 34.26 after treatment. The treatment provided statistical significant (P<0.001) result with't' value of 7.923 after completion of the treatment. In Left mid-arm circumference, the mean before treatment was 35.96 which was reduced to 34.28 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with't' value of 7.01. In Right mid-thigh circumference, the mean before treatment was 60.72 which was reduced to 58.44 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with't' value of 8.51. In Left mid-thigh circumference, the mean before treatment was 60.72 which

was reduced to 58.48 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with‘t’ value of 9.33.

Group B.

Table 4.

Parameters	Mean		Mean Diff.	SD	SE	‘t’	P	Result
	BT	AT						
Body Weight	81.84	79.62	2.22	1.47	0.29	7.55	<0.001	Sig
BMI	30.84	28.91	1.93	5.26	1.05	1.83	0.079	NS
Skin fold thickness	5.32	5.01	0.3	0.31	0.06	4.86	<0.001	Sig
Waist circumference	103.12	101.34	1.78	0.76	0.15	11.64	<0.001	Sig
Waist-hip ratio	0.95	0.94	0.01	0.03	0.01	2.38	0.025	Sig
Mid arm circumference Right	36.74	35.48	1.26	0.48	0.1	13.09	<0.001	Sig
Mid arm circumference Left	36.52	35.50	1.02	0.65	0.13	7.81	<0.001	Sig
Mid thigh circumference Right	58.70	57.38	1.32	0.64	0.13	10.26	<0.001	Sig
Mid thigh circumference Left	58.40	57.26	1.14	0.67	0.13	8.51	<0.001	Sig

The total effect of therapy on symptoms of each patient was evaluated before and after completion of the treatment. The initial mean score of 25 patients for Body Weight was 81.84 which were reduced to 79.62 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with ‘t’ value of 7.55. For BMI, the mean before treatment was 30.84 which was reduced to 28.91, exhibiting stastical not significant (P=0.079) improvement with ‘t’ value of 1.83. For skinfold thickness, the mean before treatment was 5.32 which was reduced to 5.01 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with ‘t’ value of 4.86. The initial mean score of Waist-hip ratio was 0.95 which was reduced to 0.94. The treatment provided statistical not significant (P=0.05) result with ‘t’ value of 2.38. In Waist circumference, the mean before treatment was 103.12 which was reduced to 101.34, exhibiting highly significant (P<0.001) improvement with ‘t’ value of 11.64. The initial mean score for Right mid-arm circumference was 36.74 which were reduced to 35.48 after treatment. The treatment provided statistical significant (P<0.001) result with ‘t’ value of 13.09 after completion of the treatment. In Left mid-arm circumference, the mean before treatment was 36.52 which was reduced to 35.50 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with ‘t’ value of 7.81. In Right mid-thigh circumference, the mean before treatment was 58.7 which was reduced to 57.38 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with ‘t’ value of 10.26. In Left mid-thigh circumference, the

mean before treatment was 58.40 which was reduced to 57.26 after treatment. The total effect of treatment provided statistical significant (P<0.001) result with 't' value of 8.51.

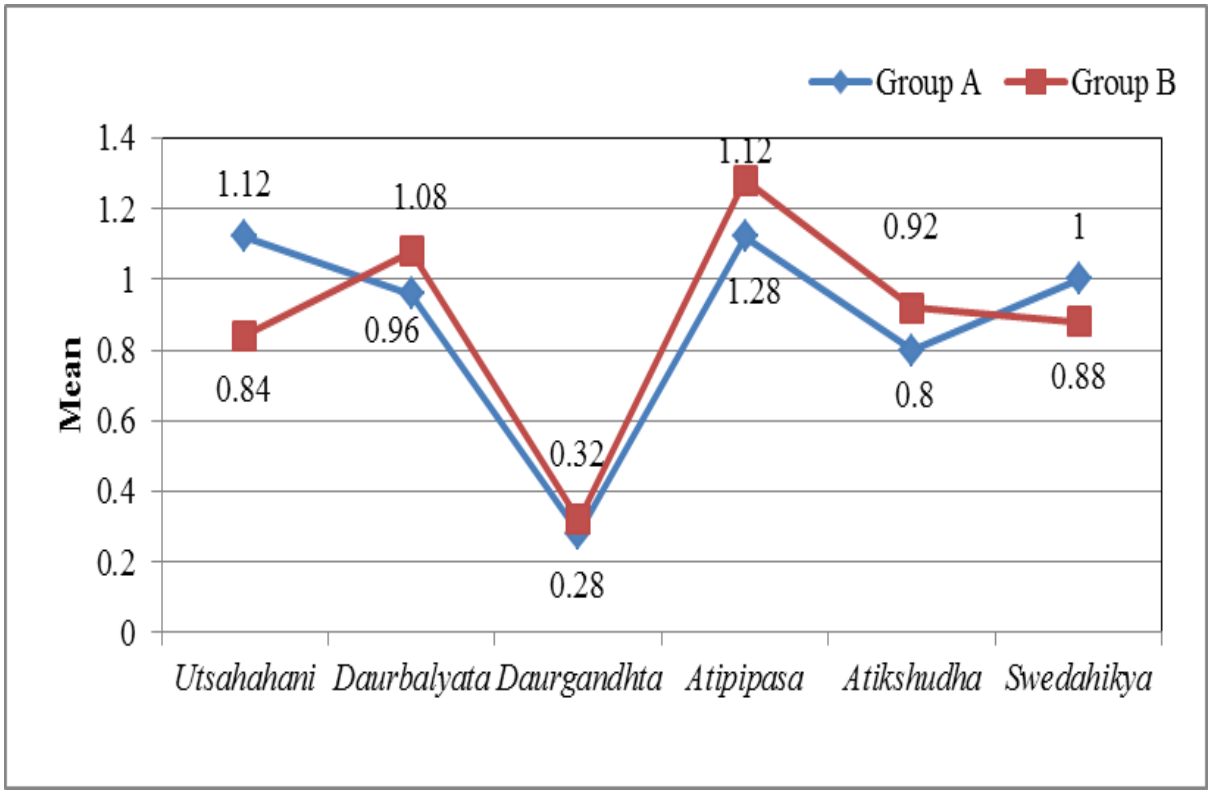
Comparison between Group A and Group B

Subjective parameters

Table 5.

Parameters	Group	N	Median	Mean Rank	Sum of Ranks	Mann-Whitney U	p-value	Result
Utsahahani	A	25	1	1.12	28	374.5	0.229	NS
	B	25	1	0.84	21			
Daurbalyata	A	25	1	0.96	24	344	0.5411	NS
	B	25	1	1.08	27			
Daurgandhta	A	25	0	0.28	7	325	0.8084	NS
	B	25	0	0.32	8			
Atipipasa	A	25	1	1.12	28	360	0.3567	NS
	B	25	1	1.28	32			
Atikshudha	A	25	1	0.8	20	348	0.4909	NS
	B	25	1	0.92	23			
Swedadhikya	A	25	1	1	25	334	0.6766	NS
	B	25	1	0.88	22			

From above table, we can observe that P-Values for all parameters were more than 0.05. Hence we conclude that there was non-significant difference in Group A and Group B. Further we can observe that mean rank for Group A was greater than Group B in Symptoms *Utsahahani* and *Swedahikya* and the mean rank was lesser in *Daurbalyata, Daurgandhta, Atipipasa, Atikshudha.*



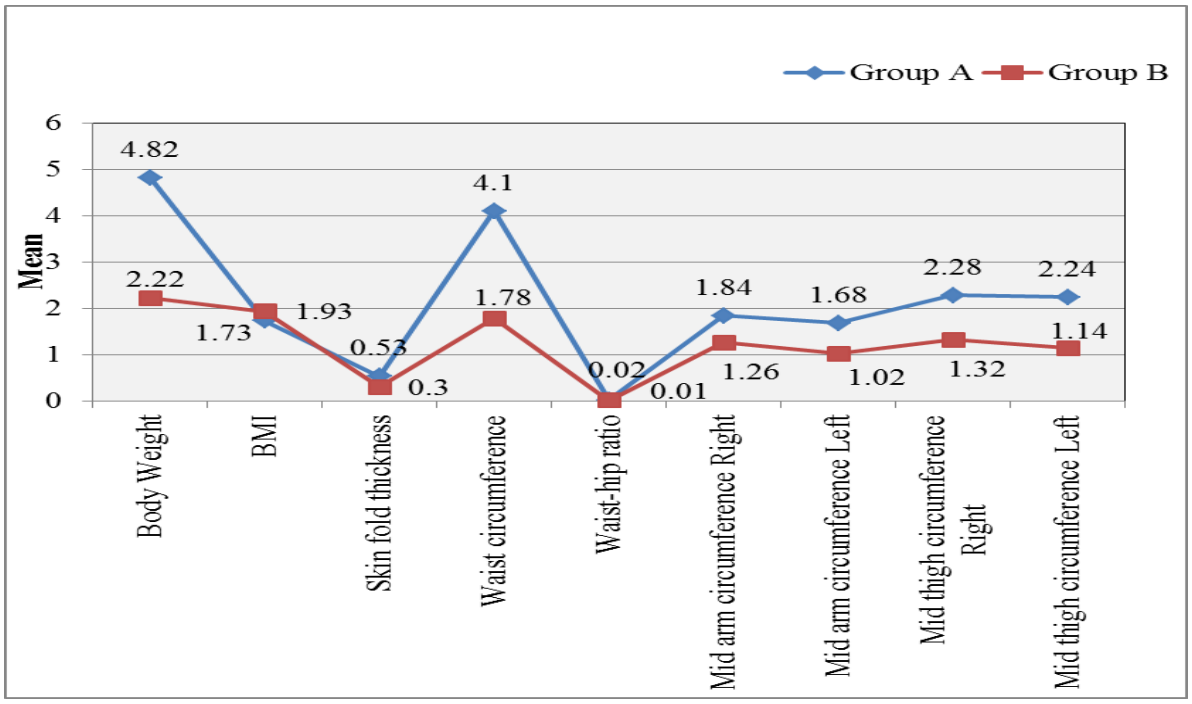
Objective parameters

Table 6.

Parameters	Group	N	Median	Mean Rank	Mann-Whitney U	p-value	Result
Body weight	A	25	4.9	120.5	565.5	<0.001	S
	B	25	2	55.6			
BMI	A	25	1.6	43.13	539.5	<0.001	S
	B	25	0.9	48.14			
Skinfold thickness	A	25	0.5	13.3	488	0.0007	S
	B	25	0.2	7.7			
Waist circumference	A	25	3	102.5	527	<0.001	S
	B	25	2	44.5			
Waist-hip ratio	A	25	0.02	0.47	412	0.053	NS
	B	25	0.01	0.3			
Mid-arm circumference Right	A	25	2	46	396.5	0.103	NS
	B	25	1	31.5			
Mid-arm circumference Left	A	25	1	42	405.5	0.071	NS
	B	25	1	25.5			
Mid-thigh circumference Right	A	25	2	57	461	0.004	NS
	B	25	1	33			
Mid-thigh circumference Left	A	25	2	56	483.5	0.0009	S
	B	25	1	28.5			

From above table, we can observe that P-Values for body weight, BMI, Skin fold thickness, waist circumference, mid thigh circumference (Right) and mid thigh circumference (Left) parameters were less than 0.05. Hence we conclude that there was significant difference in

Group A and Group B. Hence we conclude that effect observed in Group A was more than Group B.



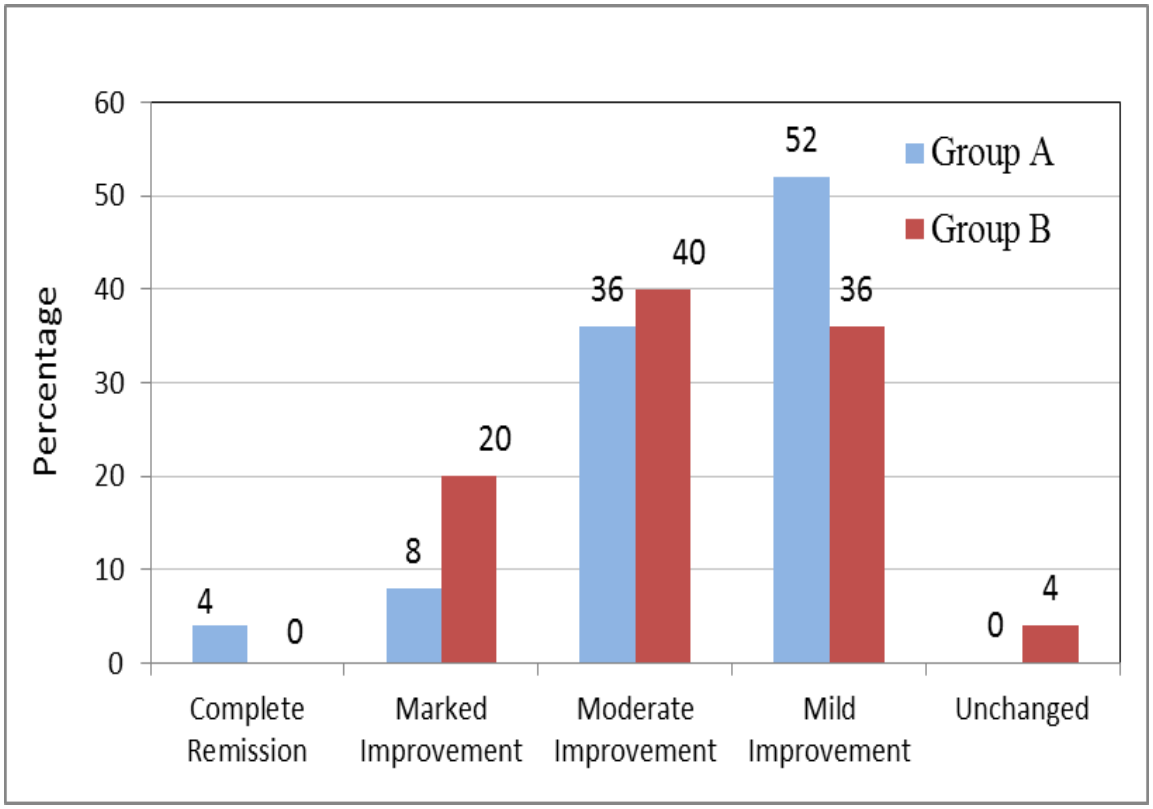
Assessment of overall effect of treatment

In subjective parameters

- Group A showed complete remission in 4% of the patient, marked improvement in 8% of the patients and 36% of the patients were showed moderate improvement and mild improvement in 52% patients.
- Group B provided marked improvement in 20% of the patients, moderate improvement in 40% patients, mild improvement in 36% and 4% patient remains unchanged.
- No patient was found unchanged/no response in Group A and no patient got complete remission in Group B.

Table 7.

Assessment	Score	Group A		Group B	
		Number of Patients	Percentage	Number of Patients	Percentage
Complete Remission	100%	01	4%	00	-
Marked Improvement	75% to 99%	02	8%	05	20%
Moderate Improvement	50% to 74%	09	36%	10	40%
Mild Improvement	25% to 49%	13	52%	09	36%
Unchanged	< 25%	Nil	-	01	4%



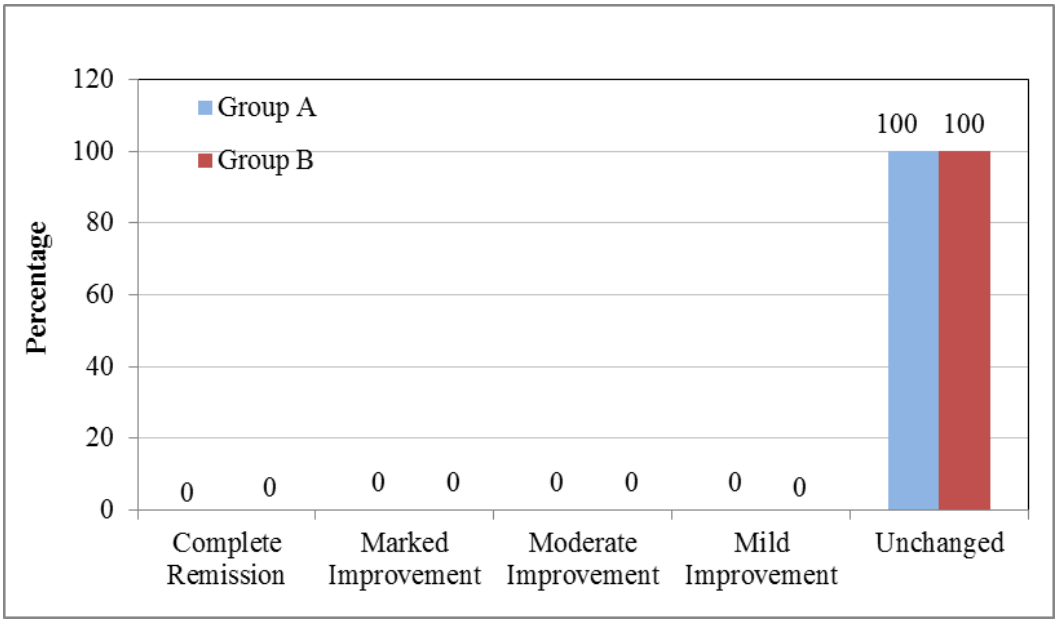
Comparative assessment of overall effect of treatment in subjective parameters.

In objective parameters

All the patients' i.e.100% remains unchanged in both groups.

Table 8.

Assessment	Score	Group A		Group B	
		Number of Patients	Percentage	Number of Patients	Percentage
Complete Remission	100%	Nil	-	Nil	-
Marked Improvement	75% to 99%	Nil	-	Nil	-
Moderate Improvement	50% to 74%	Nil	-	Nil	-
Mild Improvement	25% to 49%	Nil	-	Nil	-
Unchanged	< 25%	25	100	25	100



Comparative assessment of overall effect of treatment in objective parameters.

CONCLUSION

The total effect of treatment provided statistical significant result in *Utsahahani, Daubalyata, Atipipasa, Atikshudha, Swedhahikya* in both groups and non-significant results in the symptom *Daurgandhta* in both the groups.

In objective parameters, there was significant difference in Group A and Group B.

The effect observed in Group A was more than Group B.

In Subjective Parameters, Group A showed complete remission in 4% of the patient, marked improvement in 8% of the patients and 36% of the patients were showed moderate improvement and mild improvement in 52% patients.

Group B provided marked improvement in 20% of the patients, moderate improvement in 40% patients, mild improvement in 36% and 4% patient remains unchanged.

No patient was found unchanged/no response in Group A and no patient got complete remission in Group B.

In objective parameters, all the patients' i.e.100% remains unchanged in both groups.

Comparatively *Lekhan Basti* counter act on the *Samprapti* of the *Sthaulya* better than *Shankhaprakshalan, Kunjal kriya.*

Results of this study are encouraging and trial should be conducted for long duration with better parameters.

Importance of *Shatkarma* procedures are cost effective, less time taking procedures can be done at OPD level and easy for patients to perform.

REFERENCES

1. Pandey, Kashinath and Chaturvedi, Gorakhnath. (Ed.) Charaka Samhita, (Hindi Commentary): Sutrasthan Varanasi: India Chaukhambha Barti Academy, 2009; 1: 21-3.
2. Pandey, Kashinath and Chaturvedi, Gorakhnath. (Ed.). Charaka Samhita (Part I) (Hindi Commentary): Sutrasthan-20/17 (Reprint). Varanasi: India Chaukhambha Barti Academy, 2009; 1: 20-17.
3. Pandey, Kashinath and Chaturvedi, Gorakhnath. (Ed.) Charaka Samhita (Hindi Commentary): Sutrasthan Varanasi: India Chaukhambha Barti Academy, 2009; 1: 23-6.
4. Pandey, Kashinath and Chaturvedi, Gorakhnath. (Ed.) Charaka Samhita (Hindi Commentary): Sutrasthan Varanasi: India Chaukhambha Barti Academy, 2009; 1: 22-38.
5. Pandey, Kashinath and Chaturvedi, Gorakhnath. (Ed.) Charaka Samhita (Hindi Commentary): Sutrasthan Varanasi: India Chaukhambha Barti Academy, 2009; 1: 16-13.
6. Pandey, Kashinath and Chaturvedi, Gorakhnath. (Ed.). Charaka Samhita (Hindi Commentary): Sutrasthan Varanasi: India Chaukhambha Barti Academy, 2009; 1: 21-4.
7. Shastri, Ambikadutta. (Ed.). Sushruta Samhita: Sutrasthan Varansi: Chaukhamba Sanskrit Sansthan, 2013; 1: 15-37.
8. Pandey, Kashinath and Chaturvedi, Gorakhnath. (Ed.) Charaka Samhita (Hindi Commentary): Sutrasthan Varanasi: India Chaukhambha Barti Academy, 2009; 1: 21-20.
9. Gupta, Atrideva (Ed.). Ashtangahrdayam (Hindi Commentary): Sutrasthan Varanasi: Chaukhambha Prakashan Sutrasthan, 2015; 1: 14-4.
10. Gupta, Atrideva (Ed.) Ashtangahrdayam (Hindi Commentary): Sutrasthan Varanasi: Chaukhambha Prakashan Sutrasthan, 2015; 1: 14-5.
11. Srivastava, Shailaja (Ed.) Sharngadhar Samhita (Hindi Commentary): Poorvakhanda Varanasi: Chaukhambha Orientalia, 2015; 15: 4-11.
12. Pandey, Kashinath and Chaturvedi, Gorakhnath. (Ed.) Charaka Samhita (Hindi Commentary): Sutrasthan Varanasi: India Chaukhambha Barti Academy, 2009; 1: 4-9.
13. Jha, Peetambar, Digambarji (Ed.) Hatha Pradeepika (Hindi Commentary).Swami Kuvalyananda marga, Lonavala, Pune, Mahrashtra. Dvitya Updesha, 2017; 21.

14. Jha, Peetambar, Digambarji (Ed.) Hatha Pradeepika (Hindi Commentary). Swami Kuvalyananda marga, Lonavala, Pune, Mahrashtra. Dvitya Updesha, 2017; 1: 25.
15. K. Park. Preventive and Social Medicine Jabalpur (M.P.) Banarsi das Bhanot, 2015; 23: 1167.
16. Shastri, Ambikadutta. (Ed.). Sushruta Samhita: Chikitsasthan (Reprint). Varansi: Chaukhamba Sanskrit Sansthan, 2013; 1: 38-82.
17. The Kashyapa Samhita or Vrddha jivaka tantra by vrddha jivaka revised by vatsya translation and commentary by Tewari, P.V. Kshyapa Samhita: Khilsthan Varanasi: Choukambha visvabharati, 1996; 1: 8-9-10.