



A COMPARATIVE CLINICAL STUDY TO EVALUATE THE EFFICACY OF UDVAR-TANA WITH HARIDRADI GANA CHURNA AND KSHARA BASTI IN STHOULYA (OBESITY)

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ABSTRACT

Sthoulya(Obesity) is considered as an illness considered one amongst *Astau Nindita* due to multi-dimensional influence, ranging from mild to severe life-threatening effects. In the present study 40 patients were included to analyse the comparative effect of 2 main modalities used for management of *Sthoulya*, they are *Udvar-tana* by *Haridradi Gana Churna* & *Kshara Basti*. The patients were selected from opd & ipd of Muniyal Ayurveda Hospital. The study being a comparative clinical study with a pre and post-test design. The assessment was done by suitable scoring methods which were critically analysed. The results thus obtained were statistically subjected to Wilcoxon signed rank test was used in ordinal data and paired t test was used when data is numerical. For between the groups, Mann Whitney test was used for ordinal data and unpaired t test was used for numerical data. The end results obtained were interpreted accordingly. The study showed that Circumference of body parts like Chest, Hip and Mid-thigh circumference, Skin fold thickness at triceps, biceps, subscapular, thigh were better in Group A (*Haridradi Gana*) to targeting local fat accumulation whereas the Group B (*Kshara Basti* Group) was better in parameters like *Nidradhikya*, *Khudha*, body weight, BMI, circumference of abdomen, hip, midthigh, midarm & skin fold thickness of triceps and supra iliac region. This shows the efficacy of *Kshara Basti* in causing overall weight reduction.

Keywords: *Sthoulya*, *Medas*, *Udvartana*, *Kapha*, Obesity, *Kshara Basti*

INTRODUCTION

Obesity may be defined as an abnormal growth of the adipose tissue due to an enlargement of fat cell size (hypertrophic obesity) or an increase in fat cell number (hyperplastic obesity) or combination of both¹. Overweight and Obesity are the fifth leading risk of global deaths. Worldwide, obesity has more than doubled since 1980. In 2008, more than 1.4 billion adults, 20 years and older were overweight. Of these over 200 million men and nearly 300 million women were obese. According to WHO overall about 13% of the world's adult population were obese in 2014. As a chronic disease, prevalent in both developed and developing countries, and affecting children as well as adults, it is now so common that it is replacing the more traditional public health concerns including undernutrition. It is one of the most significant contributors to ill health. The concept of obesity is well correlated with *Sthoulya* in classical texts of Ayurveda. Charaka defines *Ati-Sthula* as Pendulus appearance of *Sphik*(buttock), *Udara* (Abdomen), *Stana* (Chest) due to excess deposition of *Meda* and *Mamsa*. Vitiating *Vata* in the *Koshta* stimulates the digestive fire, hence the person digests food quickly and desires more food².

Chikitsa is classified into two types, *Shodhana* and *Shamana*³. Among *Shodhana*, *Basti* is considered as *Ardha Chikitsa* for *Vataja* disorders by Charaka. Some other *Acharyas* considered it not only best for *Vata* disorders, but also equally effective in whole of therapeutics⁴. *Kshara Basti* is one among different types of *Basti*'s mentioned by Chakrapani, which is classified based on usage of main ingredient⁵. *Udvartana* is one of the therapies, where finely powdered *Churna* having *Ruksha Guna* is massaged against hair follicles⁶. It is also called *Shareera Parimarjana*, which eliminates *Daurgandhya*, *Gourava*, *Kandu*, *Mala* etc⁷.

The mainstay of treatment includes lifestyle changes such as Diet and Physical exercise⁸. The line of treatment of *Sthoulya* includes both *Shodhana* and

Shamana. *Kshara Basti* having *Ruksha*, *Ushna* and *Teekshna Dravyas* and *Udvartana* with *Ruksha Dravyas* of *Haridradi Gana* are more effective in *Vata*, *Kapha*, *Meda* and *Amaja Vikaras* like *Sthoulya* etc^{9,10}. Even though there are many treatment procedures for *Sthoulya*, the effect is not satisfactory. Hence a study is planned to evaluate the efficacy of *Haridradi Gana Udvartana* and *Kshara Basti* in *Sthoulya*.

Objective of the study

- To evaluate the efficacy of *Haridradi Gana Churna Udvartana* in *Sthoulya*.
- To evaluate the efficacy of *Kshara Basti* in *Sthoulya*
- To compare the efficacy of *Udvartana Karma* and *Kshara Basti* in *Sthoulya*.

Materials and Methods :

Source of data:

1. Patient source: 40 patients of *Sthoulya* (20 in each group) will be selected from OPD and IPD of Muniyal Institute of Ayurveda Medical Sciences and other referral sources by preset inclusion and exclusion criteria.
2. Literary source : All the classical, modern literatures and contemporary texts including the websites about the disease and drug will be reviewed and documented for the intended study.
3. Pharmaceutical source : All the required drugs will be taken from MIAMS Pharmacy and raw drugs required for the study will be collected from the known source.

Method of collection of the data :

(a) Study design: This is a Randomized Comparative Clinical study. 40 patients (20 in each group) of *Sthoulya* fulfilling the diagnostic and inclusive criteria will be randomly selected irrespective of Sex, Religion, Occupation and Economic status for the study.

(b) Diagnostic criteria¹² :

- *Pratyatma Lakshana* of *Sthoulya* presenting with symptoms like *Chalaspshik*, *Udara* and *Stana*,

lack of *Utsaha*, *Syasa*, *Atinidra*, *Svedabadha*, *Daurgandhya*, *Atipipasa*, *Atiksudha*, *Daurbalya*. Patients having minimum of 4-5 above mentioned symptoms will be taken for the treatment.

- Value of BMI.

(c) Inclusion criteria → Patients between 18 and 60 years of age. → Having BMI in between 27 to 40.

(d) Exclusion criteria → Patient having Eczema, Psoriasis, Cuts, Burns, wounds. → Patients with pre-diagnosed Thyroid and other Endocrine disorders. → Pregnant and Lactating women. → Other systemic diseases which intervene with the intervention.

(e) INTERVENTION: 1. Group-A: *Udvartana* with *Haridradi Gana Churna*. Powders of *Haridradi Ga-*

na Dravyas are massaged against the hair follicles in 7 different postures of the body for about 45 minutes. After the *Udvartana* procedure, the patient is asked to take rest for about 15 minutes and then allowed to take warm water bath for 8 days.

2. Group-B: *Kshara Basti* in *Yoga Basti Krama Deepana* and *Pachana* with *Ajamoda Churna* (3g) TID with hot water before food till *Nirama Lakshanas* appear. a) *Purva Karma* : Patient is subjected to *Sthanika Abhyanga* with *Bruhat Saindhavadya Taila* and *Nadi Sweda* just before the administration of *Basti*. b) *Pradhana Karma* : Administration of *Anuvasana* and *Niruha Basti* alternatively for about 8 days.

Table No.1: Pattern of Yoga Basti

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

A = *Anuvasana Basti*, N = *Niruha Basti*

c) *Paschat Karma* : *Ahara- Laghu Bhojana*, *Vihara* – Warm water bath.

Table no. 2: Ingredients: 1) Haridradi Gana –

Ingredient	Botanical name	Part used
<i>Haridra</i>	<i>Cucurma longa</i>	Tuberous root
<i>Daruharidra</i>	<i>Berberis aristata</i>	Root bark, stem
<i>Yasti</i>	<i>Glycyrrhiza glabra</i>	Root
<i>Prishniparni</i>	<i>Uraria picta</i>	Root
<i>Indrayava</i>	<i>Holarrhena antidysenterica</i>	Seeds of <i>Kutaja</i>

Table no.3: 2) Kshara Basti a) Niruha Basti Dravya:

BASTI DRAVYA	QUANTITY	QUANTITY IN GM/ ML
<i>Saindhava Lavana</i>	1 Aksha	12 gm
<i>Shatapushpa Kalka</i>	1 Aksha	12 gm
<i>Go-Mutra</i> (Diluted)	8 Pala	384 ml
<i>Amlika</i>	2 Pala	96 gm
<i>Guda</i>	2 Pala	96 gm

Anuvasana Basti with *Bruhat Saindhavadi Taila* – 1 ½ Pala (72 ml)¹³

f) Observation period : Treatment duration: *Udvartana* - 8 days. *Kshara Basti*- 8 days Follow up: After 16 days of treatment.

g) Total duration of study: 24 days.

h) Assessment Criteria: Assessment of the condition will be done based on the detailed Proforma adopting standard method of scoring of subjective and objective parameters which will be analysed statistically.

Subjective criteria¹⁴:

Table no.4: Sphik-Udara Chalatva:

SYMPTOMS	GRADE
Absence of <i>Chalatva</i>	0
<i>Chalatva</i> after fast movement or walking	1
<i>Chalatva</i> after moderate movement or walking	2
<i>Chalatva</i> after mild movement or normal walking	3

Table no.5: Kshudrashwasa:

SYMPTOMS	GRADE
Breathlessness during heavy work and relieved soon	0
Breathlessness during work but relieved soon and beyond tolerance	2
Breathlessness in resting condition	3

Table no. 6: Nidradhikya:

SYMPTOMS	GRADE
Normal sleep of 6-8 hours per day	0
Sleep upto 8-10 hours per day	1
Sleep upto 10-12 hours per day	2
Sleep more than 12 hours per day	3

Table no. 7: Atikshudha:

SYMPTOMS	GRADE
Hunger induced 4 th hourly	0
Hunger within 4 hours of previous meal	1
Hunger within 3 hours of previous meal	2
Hunger within 2 hours of previous meal	3

Objective criteria:

1. Body weight
2. BMI (kg/m²)
3. Circumferences of- a) Chest b) Abdomen c) Hip d) Mid- Thigh e) Mid- Arm
4. Skin fold thickness- a) Triceps b) Biceps c) Sub scapular d) Abdominal e) Thigh

Statistical analysis:

The assessment was done by suitable scoring methods which were critically analysed. The results thus obtained were statistically subjected to Wilcoxon signed rank test was used in ordinal data and paired t

test was used when data is numerical. For between the groups, Mann whitney test was used for ordinal data and unpaired t test was used for numerical data.

CRITERIA FOR ASSESSING THE TOTAL EFFECT

Considering the overall improvement had shown by the patient in sign and symptoms, the total effect of the therapy has been assessed as below.

- Minimum improvement- 0-25%
- Mild improvement-26-50%
- Moderate improvement-51-75%
- Maximum improvement-76-100%

Results:

Effect of *Udvartana* (Group A) and *Kshara Basti* (Group B) on various subjective criteria

Sl.no	Subjective parameters	Table/ graph
1	<i>Sphik-Udara Chalatva</i>	Table no.8 & Graph no.1
2	<i>Kshudrashwasa</i>	Table no.8 & Graph no.1
3	<i>Nidradhikya</i>	Table no.8 & Graph no.1
4	<i>Atikshudha</i>	Table no.8 & Graph no.1

Effect of *Udvartana* (Group A) and *Kshara Basti* (Group B) on objective criteria- body weight & BMI

Sl no	Objective parameter	Table/ Graph
1	Body weight	Table no.9 & Graph no.2
2	BMI	Table no.9 & Graph no.2

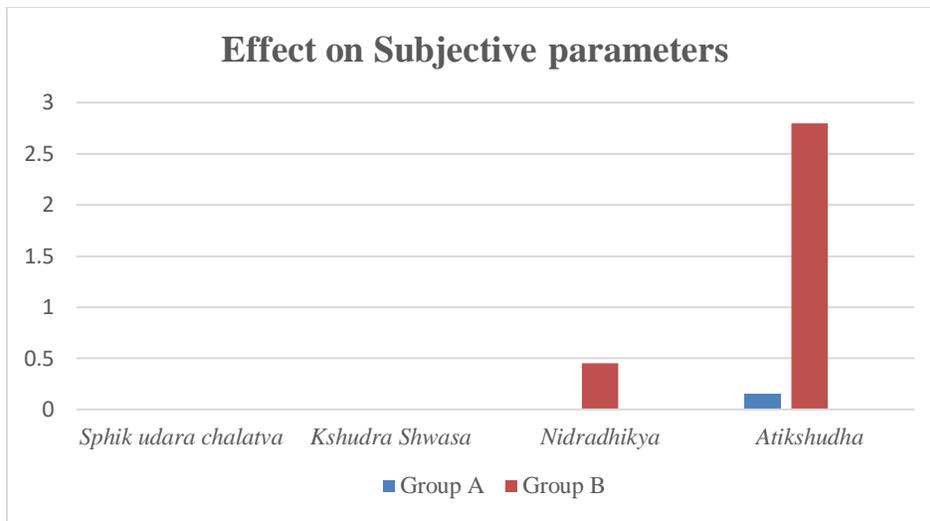
Effect of *Udvartana* (Group A) and *Kshara Basti* (Group B) on objective criteria- Various body circumferences

Sl no	Objective parameter	Table/ Graph
1	Chest	Table no.10 & Graph no.3
2	Abdomen	Table no.10 & Graph no.3
3	Hip	Table no.10 & Graph no.3
4	Mid- Thigh (R)	Table no.10 & Graph no.3
5	Mid- Thigh (L)	Table no.10 & Graph no.3
6	Mid- Arm (R)	Table no.10 & Graph no.3
7	Mid- Arm (L)	Table no.10 & Graph no.3

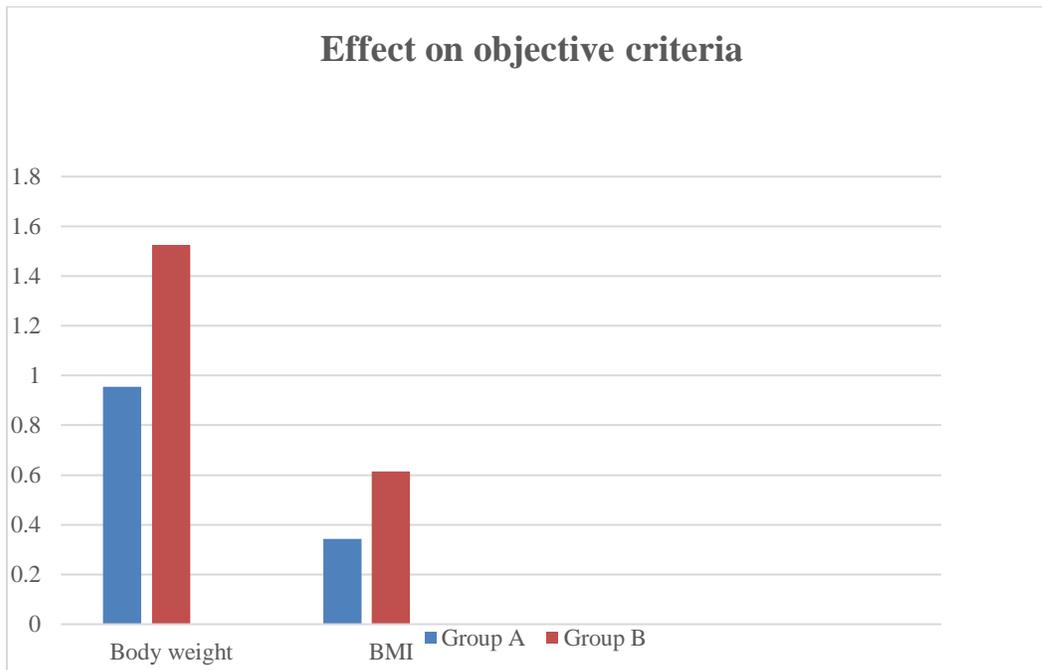
Effect of *Udvartana* (Group A) and *Kshara Basti* (Group B) on objective criteria- on various skin fold thickness

Sl no	Objective parameter	Table/ Graph
1	Subscapular (L)	Table no.11 & Graph no.4
2	Subscapular (R)	Table no.11 & Graph no.4
3	Biceps (L)	Table no.11 & Graph no.4
4	Biceps (R)	Table no.11 & Graph no.4
5	Triceps (L)	Table no.11 & Graph no.4
6	Triceps (R)	Table no.11 & Graph no.4
7	Suprailiac (L)	Table no.11 & Graph no.4
8	Suprailiac (R)	Table no.11 & Graph no.4

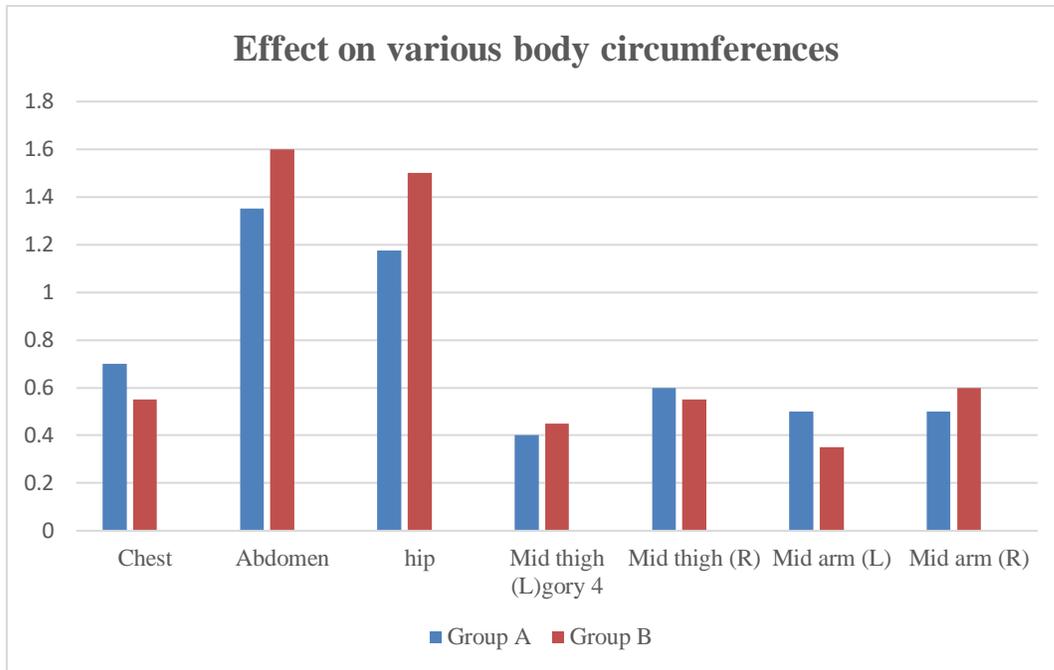
Graph no.1: Effect of *Udvartana* (Group A) & *Kshara Basti* (Group B) on subjective parameters :



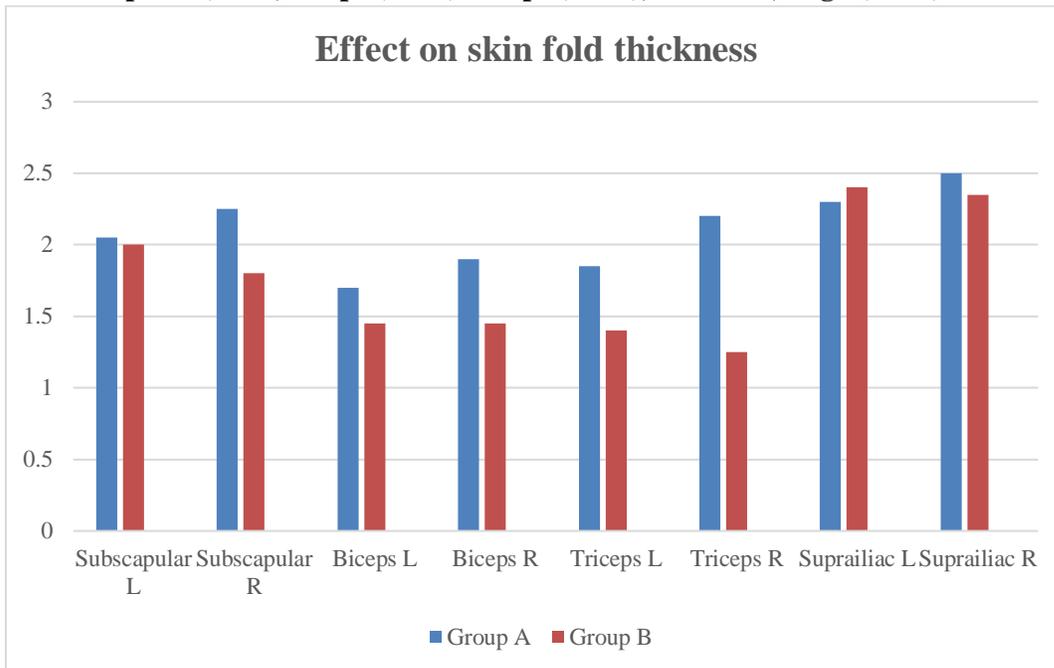
Graph no.2: Effect of *Udvartana* (Group A) & *Kshara Basti* (Group B) on objective parameters – body weight & BMI



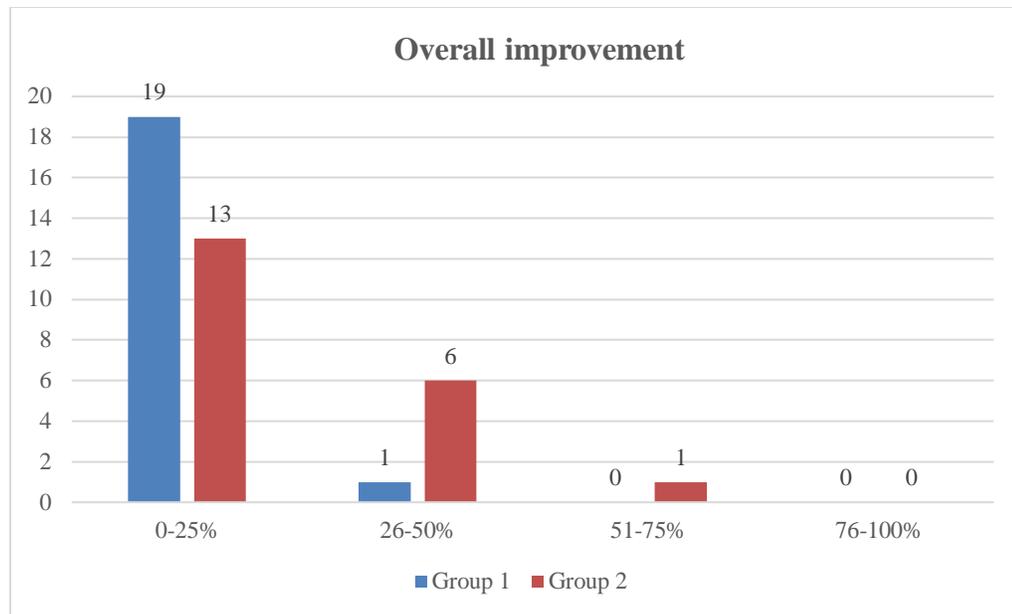
Graph no.3: Effect of *Udvartana* (Group A) & *Kshara Basti* (Group B) on objective parameters –body circumferences -chest, abdomen, hip, mid-thigh (L&R), Mid arm (L&R)



Graph no.4: Effect of *Udvartana* (Group A) & *Kshara Basti* (Group B) on objective parameters- skin fold thickness- subscapular (L&R, biceps (L&R) triceps (L&R), abdomen, thigh (L&R)



Graph no.5- overall effect of treatment in *Udvartana* (Group A) & *Kshara Basti* (Group B)



Probable mode of action:

a) *Udvartana*

The process in which the medicated powder is rubbed in opposite direction of hair follicles. Pressure with which the powder is rubbed is also equally important. Rubbing with pressure helps in the absorption of effusions, elimination of the morbid materials from the system by the relief of the blood stasis. The pressure helps in interchange of tissue fluids by increasing the circulation in lymphatics and venous systems. The pressure also has stimulating effect and helps in moving the content away from the heart. It also helps in structures below it also by increasing cutaneous circulation and benefits sensory nerve endings. This stimulation helps in influencing vasoconstrictors and vasodilators in the skin. The mechanical pressure exerted helps in improving circulation and stored blood anywhere in the body is brought to systemic circulation instant of getting stasis in the system.

The process of *Udvartana* has multitude of action and effects the *Kapha* and *Medo Vilayana* in various ways. This is attributed to the *Dravya* of *Udvartana* also. The *Ruksha Guna* helps in *Medo Vilayana*. To add to this effect *Katu*, *Tikta Rasa Yukta Dravya*, *Ushna Veerya Dravya*, *Laghu Ruksha Guna* are equally important. These properties enhance the *Bharaajaka Pitta* at the level of *Tvak*, leads to metabolism

of the medicament and leads to *Pravilayana* of *Medo Dhatu* below the *Tvak*. Further this also reduces the *Kleda* of *Vikruta Medo Dhatu* thereby reducing the *Avarana* of *Medo Dhatu* and prevents the formation of *Abaddha Medas* (loose subcutaneous fat). The *Dhatvagni Mandya* present at the level of *Medo Dhatu* is also rectified by the properties of *Udvartana Churna*. The *Medovaha Srotas* also being influenced by this, the excess amount of *Kleda* is getting absorbed due to *Ruksha Guna* of *Udvartana Churna*. Thus, overall influencing the guna of *Medas* by the concept of *Vishesha Siddhanta*, thus doing the *Samprapti Vighatana* of *Sthoulya*.

b) *Kshara basti*

Basti is considered as one of the most important lines of treatment in case of *Sthoulya*. The efficacy of *Basti* is believed to be due to its *Veerya* (active principles). Due to which it gets spread throughout the through the *Srotas* all over the body like watering the plants at the roots which will give maximum benefits. The *Basti* is said to be administered in *Pakwashaya*. It's taken up by with the help of *Samana* and *Apanavata*. It also controls vitiated *Pitta* and *Kapha* as per the formulation and by the virtue of *Kedarakulyanyaya* it spreads to various parts of the body due to its *Veerya* and *Chalatva* of *Vata Dosha*. The contents of *Kshara Basti* are *Chincha*, *Gomutra*, *Shatapushpa*, *Saidhava*,

Guda. Due to *Ushna Veerya* and *Katu-Tikta-Kashaya Rasa*, they are antagonistic to *Kapha*, *Medas* and *Vata*, which help in removal of the *Sanga* in *Srotas* of *Medas* and thereby causing *Medokshaya*. Due to these properties, it causes *Kapha Kshaya* and *Vata Kshaya*, by which it does the *Samprapti Vighatana* of *Sthoulya*.

Kshara Basti which has irritant properties, causes mild inflammation to colon, this inflammation may influence drug absorption. The factors influencing drug absorption include generalised increase in inflammation which accounts to increase in capillary permeability. By which all the herbs in the *Basti* gets absorbed and transported to all over the body upto the ileocecal junction. From there it will help in metabolism by influencing gut metabolites like CCK, Ghrelin & also influencing metabolites of glucose, thereby helping in reduction of weight. It also might influence various hormones like insulin, cortisol, leptins help in reducing hunger and there by control binge eating. The *basti* also can stimulate vagus nerve there by influencing hunger/ satiety centre in the brain and also control neuroendocrine functions. By all these we can say that *Kshara Basti* as a whole as mentioned classically will help at multiple levels counteracting deranged fat metabolism and energy imbalance.

Overall effect of treatment:

After assessing the above subjective and objective parameters, the effect of therapy has been classified based on improvement on the following parameters. Minimum response 0-25%, Mild response - 26-50%, Moderate response - 51-75%, Maximum response - 76-100%

Group wise - in group A - 95% has Minimum response, 5% had Mild response & no patients had Moderate to Maximum response.

In group B - 65% had Minimum response, 30% of the patients had Mild response, 5% had Moderate response, 33.33% had Maximum response.

Overall, the response was better in case of *Kshara Basti* group compared to *Haridradi Gana* group.

CONCLUSION

- *Udvartana* is known to work by the principles of *Kapha Medo Harana*, *Anga Sthirikarana*, thereby causing direct effect on *Sthoulya*; *Kshara Basti* owing to its content works holistically causing removal of *Kapha*, *Medas*, stimulating *Jatharagni* and *Dhatwagni*, there by counteracting *Sthoulya*.
- Both the procedures have their own set of advantages & disadvantages, the selection of the procedure can be based on the indication & requirement.
- In the present study, comparison of overall effects of in both the groups, showed that, Group B (*Kshara Basti*) offered better weight reduction when compared to Group A (*Haridradi Gana Udvartana*), which showed average result on *Sthoulya*.
- The results in objective parameters like Circumference of body parts like Chest, Hip and Mid-thigh circumference, Skin fold thickness at triceps, biceps, subscapular, thigh were better in Group A (*Haridradi Gana*) implies the procedure of *Udvartana* is best to target local fat accumulation in these areas. *The Udvartana* group also revealed improvement in skin glow, complexion due to *Twachya* herbs present in the formulation.
- Group B (*Kshara Basti Group*) was better in parameters like *Nidradhikya*, *Khudha*, body weight, BMI, circumference of abdomen, hip, midthigh, midarm & skin fold thickness of triceps and supra iliac region. This shows the efficacy of *Kshara Basti* in causing overall weight reduction.
- The deficit in the results in both the case can be attribute to various factors like :
 - a) Duration of 8 days is not sufficient – longer duration of procedures might be required to get better results. Multiple courses of the same procedure might be required to get excellent results along with proper Physical Exercise, Diet planning.

- b) Seasonal factors play a direct role in the outcome of the procedures as variation in *Dosha*, *Dushya* might be brought upon by the same. Like in *Greeshma Rutu* there might be more difficulty in performing procedures due to excess ambient temperature, which will influence the result.
- A multi-modality approach will be more suitable in the treatment of *Sthoulya* including- *Panchakarma* therapy, Diet, Exercise of various forms, Stress management, Yoga to get desired healthy weight loss, without disturbing normal physiology.

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Table no.8: Effect of *Udvartana* (Group A) & *Kshara Basti* (Group B) on subjective parameters

		<i>Sphik Udara Chalatva</i>		<i>Kshudra Shwasa</i>		<i>Nidradhikya</i>		<i>Atikshudha</i>	
		Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B
Mean		0.000	0.000	0.000	0.000	0.000	0.450	0.150	0.550
SD		0.000	0.000	0.000	0.000	0.000	0.605	0.366	0.510
SEM		0.000	0.000	0.000	0.000	0.000	0.135	0.081	0.114
Median		0.000	0.000	0.000	0.000	0.000	0.000	0	1
Mann whitney U	T val-ue	410.00		410.00		330.00		330.00	

test	U value	200.00	200.00	120.00	120.00
	V value	1.000	1.000	0.002	0.009

Table no.9: Effect of *Udvartana* (Group A) & *Kshara Basti* (Group B) on objective parameters – body weight & BMI

	Body weight		BMI	
	Group A	Group B	Group A	Group B
Mean	0.955	1.525	0.342	0.615
SD	0.350	1.525	0.145	0.282
SEM	0.078	0.170	0.032	0.063
Unpaired t test	T value	320.5	290.0	
	U value	0.016	0.001	

Table no.10: Effect of *Udvartana* (Group A) & *Kshara Basti* (Group B) on objective parameters – body circumferences -chest, abdomen, hip, mid-thigh (L&R), Mid arm (L&R)

	Chest		Abdomen		Hip		Mid-thigh (L)		Mid-thigh (R)		Mid arm (L)		Mid arm (R)	
	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B
Mean	0.700	0.550	1.350	1.600	1.175	1.500	0.400	0.450	0.600	0.550	0.500	0.350	0.500	0.600
SD	0.657	0.605	0.587	1.046	0.634	0.759	0.503	0.510	0.598	0.510	0.513	0.587	0.513	0.681
SEM	0.147	0.135	0.131	0.234	0.142	0.170	0.112	0.239	0.134	0.114	0.115	0.131	0.115	0.152
Unpaired t test	T value	434.00	385.00		350.00	400.00			415.500	445.00			400.00	
	P value	=0.478	0.446		0.080	0.764			=0.877	0.275			0.772	

Table no.11: Effect of *Udvartana* (Group A) & *Kshara Basti* (Group B) on objective parameters- skin fold thickness- subscapular (L&R, biceps (L&R) triceps (L&R), abdomen, thigh (L&R)

	Sub-scapular L		Sub-scapular R		Biceps L		Biceps R		Triceps L		Triceps R		Suprailiac L		Suprailiac R	
	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B
Mean	2.050	2.000	2.250	1.800	1.700	1.450	1.900	1.450	1.850	1.400	2.200	1.250	2.300	2.400	2.500	2.350
SD	0.6	0.9	1.3	0.8	1.0	1.0	0.8	0.9	0.8	1.0	1.0	1.2	0.7	1.1	1.3	1.2

	05	18	33	94	81	99	52	99	75	46	56	00	33	88	18	68
SEM	0.1	0.2	0.2	0.4	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2
	35	05	98	19	42	46	91	23	96	34	36	28	64	66	95	84
Un- paire d t test	T val ue	417.00	1.254	441.500	471.00	1.475	502.500	395.500	419.00							
	Pva lue	0.844	0.109	0.378	0.080	0.148	0.010	0.685	0.813							

Table no.12- overall effect of treatment in *Udvartana* (Group A) & *Kshara Basti* (Group B)

Improvement	Scale	No. of patients		% of patients	
		Group A	Group B	Group A	Group B
Minimum	0-25%	19	13	95%	65%
Mild	26-50%	1	6	5%	30%
Moderate	51-75%	0	1	0%	5%
Maximum	76-100%	0	0	0%	33.33%