

**A COMPARATIVE STUDY ON THE EFFICACY OF 'LEKHAN GHAN VATI' AND
'LEKHAN BASTI' IN THE MANAGEMENT OF STHAULYA(OBESITY)****Dr. Gupta Payal^{*1}, Mishra Pramod Kumar² and Soni Anamika³**¹PG Scholar PG Dept. of Kaya Chikitsa, University College of Ayurved, Dr. S. R. Rajasthan Ayurveda University Jodhpur Rajasthan.²MD, Ph.D (Ayu.)Asso. Professor & HOD PG Dept. of Kaya Chikitsa, University College of Ayurved, Dr. S. R. Rajasthan Ayurveda University Jodhpur Rajasthan.³MD (Ayu.) Assistant Professor PG Dept. of Kaya Chikitsa, University College of Ayurved, Dr. S. R. Rajasthan Ayurveda University Jodhpur Rajasthan.***Corresponding Author: Dr. Gupta Payal**

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ABSTRACT

Sthaulya (Obesity) is blessing of modern age of machines and materialism. It is physiological, psychological and social disorder, which is most disfavoured by modern society for social as well as medical reasons. In Ayurveda Acharya Charaka has described Sthaulya under eight undesirable constitutions ("Ashtanindita Purusha") Keeping in view, this burning problem of the present era and its associated devastating disease, it has been decided to do research on Sthaulya with following **AIMS AND OBJECTIVES-** Conceptual study on Sthaulya (obesity). To assess the efficacy of LekhanGhanVvati and Lekhanbasti in the management of Sthaulya. To compare clinical efficacy of Lekhan Ghan Vati alone and Lekhanbasti with LekhanGhanVati both together. **MATERIAL AND METHODS-** The study was conducted on 40 clinically diagnosed patient of Sthaulya(obesity)and randomly divided into two groups. In **Group-A:** 20 patients will be administered Lekhan ghan vati 2 tab each tab 500mg; twice in a day with lukewarm water for 30 days. In **Group-B:** 20 patients will be administered Lekhan ghan vati 2 tab each tab 500mg; twice in a day with lukewarm water along with Lekhanbasti (350-400 ml) for 30 days. **Statistical Analysis-**was done with help of Instate Graph Pad software3.1 using Wilcoxon matched-pairs signed ranks test and Mann-Whitney test. **RESULTS-** Statistically maximum highly significant result was observed in Group-B & Significant result was observed in Group-A. **CONCLUSION-** The therapy in the form of administration of **Lakhan ghanvati and LekhanBasti** separately or in combination is a safe and effective in the management of Sthaulya (obesity).

KEYWORDS: Sthaulya, Obesity, Ashtanindita Purusha, Lekhanghanvati, Lekhan Basti**INTRODUCTION**

In the present era of modernization and fast life, techniques have made people busy hence living stressful life. People are taking more junk and fatty foods, consumption of fast foods having high calories. Availability of every comfort of living has reduced physical activity thus increase in body fats along with cholesterol in the body, which invites the disorders like Obesity, Dyslipidaemia, Hypertension, Heart disease, etc.

Sthaulya (Obesity) is blessing of modern age of machines and materialism. It is physiological, psychological and social disorder, which is most disfavoured by modern society for social as well as medical reasons. The present day society expects peak physical and mental performance from each of its

member and obese person is unable to find out himself physical and mental fit for it. It occurs as a result of lack of physical activities with increased intake of daily diet results into the clinical entity, which can be called as obesity.

Ayurveda which is not only a system of medicine but a way of life, advocating prevention of disease as primary aim and following holistic approach in dealing with different diseases. *Acharya Charaka* has described *Sthaulya* under eight undesirable constitutions (*Ashtanindita Purusha*)^[1] based on their abnormal/awkward appearance, victim of public abuse, unmanageable public health condition. *Sthaulya* is one among *Kapha* dominant diseases involving *Kapha* and *medas* as main *Dosha and Dushya* in the pathogenesis. *Acharya Charaka* clearly mentioned that *Sthaulya* and *Prameha* have a direct relation because both have

Kledaka Kapha and *Medas* dominance in their pathogenesis.

In *Ayurveda*, Abnormal composition of is *Medo dhatu* considered as *Medodosha* & subsequently as *Medoroga*. Derangement of *Agni* or digestive powder leads to production of *Ama*, which disturbs *Dhatvagni* of *Medodhatu* & blocks the proper formation of further *Dhatu*. Improperly formed *Medodhatu* accumulates in the body Causing *Sthaulyaroga*. Accumulated *Medo* cause disturbance to the action of *Vata*, which cause increased appetite, due to *Chala Guna* of *Vata*. Patients therefore eat more & the entire food is abnormally converted into *Medodhatu*.^[2] Worldwide obesity has more than doubled since 1980. In 2014, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 600 million were obese. 39% of adults aged 18 years and over were overweight in 2014, and 13% were obese. Most of the world's population live in countries where overweight and obesity kills more people than underweight. 41 million children under the age of 5 were overweight or obese in 2014.

Keeping in view, this burning problem of the present era and its associated devastating disease, it has been decided to do research on *Sthaulya* with certain *Ayurvedic* Classical remedies. To try out to assess the efficacy of *LekhanGhanvati* and *LekhanBasti* in the management of *Sthaulya* has been selected for the present topic.

AIMS AND OBJECTIVES

1. Conceptual study on *Sthaulya* (obesity).
2. To assess the efficacy of *Lekhan Ghan Vvati* and *Lekhanbasti* in the management of *Sthaulya*.
3. To compare clinical efficacy of *Lekhan Ghan Vati alone* and *Lekhan basti* with *Lekhan Ghan Vati* both together.

Trial Drug:

Lekhan Ghan Vati (Drug Of Lekhniya Mahakashya)⁽³⁾

Showing the Content of the Lekhana Ghan Vati

Name of drug	Latin name	Proportion	Part used
Musta	<i>Cyprus rotundus</i>	1 part	Rhizome
Kutha	<i>Saussurealappa</i>	1 part	Root
Haridra	<i>Curcuma longa</i>	1 part	Rhizome
Daruharidra	<i>BerberisAristata</i>	1 part	Stem / Root
Vacha	<i>Acoruscalamus</i>	1/4part	Rhizome
Ativisha	<i>Aconitum heterophyllum</i>	1/4part	Tuber
Katurohini	<i>Picrorrhiza kurroa</i>	1 part	Root
Chitrak	<i>Plumbago Zeylanica</i>	1 part	Root bark
Chirbilva	<i>Holoptelea integrifolia</i>	1 part	Bark
Hemvati	<i>Iris ensata</i>	1/4 part	Rhizome

MATERIALS AND METHODS

Criteria for the Selection of Patients

(a) Selection of patients

The study will be conducted on minimum 40 & above clinically diagnosed patients of *Sthoulya* from OPD/IPD of hospital, DSRRAU jodhpur.

(b) Selection Criteria

Inclusion Criteria

- 1) Diagnosed & confirmed cases of *Sthaulya* on the basis of clinical parameters & investigation.
- 2) Patients between the age group of 18-60 years in both sex.
- 3) Patient with B.M.I. < 40
- 4) Patients willing to sign the consent form.

Exclusion Criteria

- 1) Patients with age below 18yrs. & above 60 yrs.
- 2) Patients suffering from diseases like Nephrotic syndrome, Hypothyroidism, DM, Chronic infections & other serious illnesses.
- 3) Patient having B.M.I. 40 and more than 40.
- 4) Patient having obesity due to secondary reason such as drug induced or hormonal imbalance.
- 5) Patients not willing for consent.

Plan of Study

Patients will be selected with irrespective of age, sex, religion, caste etc. and randomly distributed into following 2 therapeutics groups with 20 patients in each group.

Group A - 20 patients will be administered *Lekhan ghan vati* 2 tab each tab 500mg; twice in a day with lukewarm water for 30 days.

GroupB- 20 patients will be administered *Lekhan ghan vati* 2 tab each tab 500mg; twice in a day with lukewarm water along with *Lekhan basti* (350-400 ml) for 30 days.

Duration of trial: 1 month.

Followup: Patient have been examined for follow up for one month at the interval of 15 days to record the effect of therapy.

Method of Preparation

The coarse powder (*Yavkutta churna*) form of all the drugs as described above in the table are taken in equal quantity.

Now, the eight times of water is added to it and boiled on medium flame till it reduces to one fourth in the quantity.

Lekhan Basti**Showing the Content of the Lekhana Basti**

Name of drug	Latin name	Proportion	Part used
Haritaki	<i>Terminalia chebula</i>	1 part	Fruit
Vibhitaki	<i>Terminalia belerica</i>	1 part	Fruit
Aamlaki	<i>Embilica officinalis</i>	1 part	Fruit
Musta	<i>Cyprus rotundus</i>	1 part	Rhizome
Vidanga	<i>Embelia ribes</i>	1 part	Fruit
Haridra	<i>Curcuma longa</i>	1 part	Tuber
Daruharidra	<i>Berberis Aristata</i>	1 part	Stem / Root
Chirbilva	<i>Holoptelea integrifolia</i>	1 part	Bark
Gomutra		80 ml	
Yavakshar		10 gm	
Sandhavlavan		5 gm	
Madhu		40 ml	
Musturd oil		40 ml	

The decoction (*Kwatha*) so formed is then filtered and boiled continuously till *Ghana* (semisolid form) is obtained. The *Ghana* so obtained is then air dried and processed to fine granules. The granules are then mixed with binding agent (*Gomutrabhavita Guggulu*) & compressed in the form of tablet by tablet making machine.

Method of Preparation of Basti

First of all *kwath dravyas* are poured in to 16 times water then boiled it until 1/4th of water or decoction left overs. Then decoction is filtered. *Madhu, Saindhava*, and *Yavakshar* are mixed in a separate pot then *Sarshapa taila* added to it and mixed well till all *Dravyas* completely mixed. After that *Kalka* has been added to it and mixed well. Lastly *Gomutra* and two time filtered *Kwath* are added to this mixture. Finally *Basti* is formed which is ready for use.^[4]

Criteria For Assessment

For assessing the variables, patients were examined in every 15 days, the suitable scoring method and objective signs were recorded. After completion of 30 days duration treatment, the efficacy of therapy was assessed on the basis of following subjective as well as objective Criteria.

Subjective Criteria**1. Kshudrashwasa**

	B.T.	A.T.
Dyspnoea after heavy work (movement) but relieved soon and up to tolerance	0	0
Dyspnoea after moderate work but relieved later and up to tolerance	1	1
Dyspnoea after little work but relieved later and up to tolerance	2	2
Dyspnoea after little work but relieved later and beyond tolerance	3	3
Dyspnoea in resting condition	4	4

2. Gaurava (heaviness in body)

	B.T.	A.T.
No heaviness in body	0	0
Feels heaviness in body but it does not hamper routine work	1	1
Feels heaviness in body which hamper daily routine work	2	2
Feels heaviness in body which hamper movement of the body	3	3
Feels heaviness with flabbiness in all over body which cause distress to the person	4	4

3. Alasya (Letharginess)

	B.T.	A.T.
No Alasya (doing work satisfactorily with proper vigor in time)	0	0
Doing work satisfactorily with initiation & late in time	1	1
Doing work satisfactorily with lot of mental pressure & late in time	2	2
Doing work unsatisfactorily with lot of mental pressure & late in time	3	3
Not starting any work on his own responsibility and doing little work very slowly	4	4

4. Angasada (Sluggishness of body)

	B.T.	A.T.
No fatigue	0	0
Little fatigue in doing hard work	1	1
Moderate fatigue in doing routine work	2	2
Excessive fatigue in doing routine work	3	3
Excessive fatigue even in doing little work	4	4

5. Kshudhaadhikya (Excessive hunger)

	B.T.	A.T.
Taking diet 2 times a day without any supplementary diet	0	0
Taking diet 2 times a day with any supplementary diet	1	1
Taking diet 3-4 times a day without any supplementary diet	2	2
Taking diet 3-4 times a day with any supplementary diet	3	3
Taking irregular or intermittent diet	4	4

6. Pipasaaadhikya (Excessive thirst)

	B.T.	A.T.
Normal thirst (1-2 liter intake of water)	0	0
Up to 1 liter excess intake of water	1	1
1 to 2 liter excess intake of water	2	2
2 to 3 liter excess intake of water	3	3
More than 3 liter excess intake of water	4	4

7. Swedaaadhikya (Excessive sweating)

	B.T.	A.T.
Sweating after heavy work and fast movement or in hot season	0	0
Profuse sweating after moderate work and movement	1	1
Sweating after little work and movement	2	2
Profuse sweating after little work and movement	3	3
Sweating even at rest or in cold season	4	4

8. Atinidra (Excessive sleep)

	B.T.	A.T.
Normal sleep 6-7 hrs./ day	0	0
Sleep up to 8 hrs / day	1	1
Sleep up to 8 hrs./day with angagaurava and jrimbha	2	2
Sleep up to 10 hrs./day with tandra	3	3
Sleep more than 10 hrs./day with tandra and klama	4	4

9. Daurbalya (Weakness)

	B.T.	A.T.
Can do routine exercise	0	0
Can do moderate exercise without difficulty	1	1
Can do only mild exercise	2	2
Can do mild exercise with very difficulty	3	3
Cannot do even mild exercise	4	4

10. Kricchavyavayata (Difficulty in sexual intercourse)

	B.T.	A.T.
Unimpaired libido and sexual performance	0	0
Delay in libido but can perform sexual act	1	1
Decrease in libido but can perform sexual act	2	2
Decrease in libido but can perform sexual act with difficulty	3	3
Loss of libido and cannot perform sexual act	4	4

Objective Criteria**Anthropometric Parameters**

(a) Weight, height, BMI, Waist circumference, Hip circumference, W: H Ratio, Skin fold Thickness (Bicep, Tricep, & Nape of Neck)

(b) Biochemical Parameters / Lab. Investigation

S. Cholesterol, S. Triglyceride, HDL, LDL and VLDL (Lipid Profile)

Statistical Analysis

The information collected on the basis of observation were analyzed using appropriate statistical test as following.

The Wilcoxon matched-pairs signed rank test (For Nonparametric Data) & Paired "t" test (for Parametric Data) was used in intra group for statistical analysis of result. The Mann-Whitney Test & Unpaired "t" test was used for inter group comparison.

The obtained results were interpreted to evaluate the significances at different levels i.e. at 0.05, 0.01 and 0.001 levels as following.

Not significant (NS) - $p > 0.05$

Significant (S) - $p < 0.05$

Very Significant (VS) - $p < 0.01$

Extremely Significant (ES) - $p < 0.001 / p < 0.0001$

OBSERVATION

Total 40 patients of *Sthaulya* were studied in the present study. They were in the age range of 18-60 years with maximum in the age group of 18-30 years (55%). In this series maximum numbers of patients were female (55%), Hindu (97.5%), Married (65%), house wives (32.5%),

educated Graduate/PG level (42.5%) and Middle class (40%). Dashavidha Pariksha biostatistics showed that maximum number of the patients were having Vata-KaphaPrakriti (62.5%) and Kapha Pitta was 25%. Rajas Manasa Prakriti (77.5%), Madhyam Smahana (62.5%), Madhyam Sara (77.5%)m Madhyam Satva (47.5%) , maximum patients were AvarVyayam Shakti (50%), Vishamagni (37.5%), Pravara Abhyavaharana Shakti (47.5%) and pravara Jaran Shakti (47.5%), Madhyam Koshtha (65%) AtiSnigdha Ahara (62.5%), Ati Guru (27.5%), AtiSheeta (32.5%), AtiMadhura (60%), AtiBhojana (42.50%), fast food (67.5%), Bekri(40%)

Milk product (55%)were the probable Aharatmaka Nidana observed in most of the patients.. Bharavridhi, being Pratyatma Lakshana of the disease was available in all(100%) patients. Kshudrashwasa in 72.5%Gaurava in 87.5%, Alasayain 82.5%, Angasada in 75%, Kshudhaadhikya in 60%,Atinidra in 55%, Dourbalya in 45% , Kricchavyavayata in 42.5%, Pipasaaadhikya&swdaadhikya found in 37.5% .of the patients.

RESULT

Table 1: Showing Effect of Therapy in Subjective Parameters (Wilcoxon matched paired single ranked test).

Variable	Gr.	N	Mean		MeanDiff.	% relief	SD±	SE±	P	S
			BT	AT						
KshudraShwasa:	A	20	1.30	0.75	0.55	42.30	0.510	0.114	0.001	V.S
	B	20	1.50	0.60	0.90	60	0.911	0.2039	0.0005	E.S
Gaurava	A	20	2.25	1.60	0.65	28.88	0.670	0.150	0.002	V.S
	B	20	1.60	0.80	0.80	50	0.41	0.09	<0.0001	E.S
Alasaya	A	20	1.80	1.45	0.35	19.44	0.4894	0.1094	0.015	S
	B	20	1.85	0.95	0.9	48.64	0.852	0.190	0.001	VS
Angasada	A	20	1.45	1.10	0.35	24.13	0.4894	0.1094	0.015	.S
	B	20	1.70	0.95	0.75	44.11	0.716	0.160	0.001	V.S.
Kshudhaadhikya	A	20	1.45	1.15	0.30	20.68	0.4702	0.1051	0.03	S
	B	20	1.55	1.05	0.5	32.25	0.6882	0.153	0.007	V.S
Pipasaaadhikya	A	20	0.90	0.65	0.25	27.77	0.716	0.160	0.1953	N.S
	B	20	1.10	0.55	0.55	50	0.944	0.211	0.03	S
Swedaaadhikya	A	20	0.70	0.60	0.10	14.28	0.447	0.100	0.37	N.S
	B	20	1.05	0.70	0.35	33.33	0.489	0.1094	0.01	S
Atinidra	A	20	1.20	0.95	0.25	20.83	0.638	0.142	0.16	N.S
	B	20	1.65	1.05	0.6	36.36	0.680	0.152	0.002	VS
Dourbalya	A	20	0.70	0.50	0.20	28.57	0.615	0.137	0.18	N.S
	B	20	0.95	0.50	0.45	47.36	0.604	0.135	0.01	S
Kricchavyavayata	A	20	0.45	0.35	0.10	22.22	0.447	0.100	0.37	N.S
	B	20	0.75	0.40	0.35	46.66	0.489	0.109	0.015	S

Table 2: Showing Effect of Therapy in Anthropometric Parameter.

Variable	Gr	N	Mean		M.D	% Relief	SD±	SE±	‘t’ value	P	S
			BT	AT							
Body weight	A	20	86.48	85.25	1.23	1.42	1.968	0.440	2.79	0.011	S
	B	20	81.05	78.82	2.23	2.75	2.59	0.579	3.84	0.001	VS
BMI	A	20	31.38	31.15	0.23	0.73	2.88	0.645	0.367	0.717	NS
	B	20	29.88	29.01	0.87	2.91	0.914	0.204	4.25	0.0004	ES
Waist circumference	A	20	108.8	107.80	1.00	0.92	1.598	0.357	2.799	0.011	S
	B	20	96.37	95.35	1.02	1.05	1.371	0.306	3.331	0.003	VS
Hip circumference	A	20	116.48	115.75	0.72	0.61	1.88	0.42	1.717	0.1	NS
	B	20	110.09	108.38	1.71	1.55	2.92	0.654	2.618	0.01	S
W:H Ratio	A	20	0.931	0.920	0.011	1.18	0.022	.005	2.25	0.035	S
	B	20	0.893	0.871	0.022	2.46	0.140	0.003	0.698	0.493	NS
Bricep(SFT)	A	20	2.260	1.992	0.267	11.5	0.0423	0.09	2.82	0.01	S
	B	20	2.50	2.19	0.31	12.4	0.381	0.085	3.638	0.001	VS
Tricep(SFT)	A	20	2.956	2.758	0.198	6.69	0.327	0.073	2.708	0.014	S
	B	20	3.37	2.88	0.487	14.2	0.561	0.125	3.87	0.001	VS
Nape of neck (SF)	A	20	2.33	2.26	0.06	2.57	0.1242	0.027	2.287	0.033	S
	B	20	2.10	2.02	0.07	3.33	0.0854	0.019	3.848	0.001	VS

Table 3: Showing effect of Therapy in Biochemical Profile.

Variable	Gr	N	Mean		MeanDiff.	% Relief	SD±	SE±	“t value	P	S
			BT	AT							
Sr. Cholesterol	A	20	216.43	205.77	10.65	4.92	14.71	3.289	3.239	0.004	VS
	B	20	193.15	146.06	47.09	24.38	34.48	7.71	6.10	<0.0001	E.S
Sr. Triglyceride	A	20	140.77	122.75	18.02	12.80	21.08	4.71	3.82	0.0011	VS
	B	20	161.32	134.87	26.44	16.38	21.77	4.86	5.43	<0.0001	E.S
HDL	A	20	53.54	54.54	-0.99	1.84	1.545	0.345	2.88	0.009	V.S
	B	20	44.63	50.71	-6.07	13.60	8.034	1.79	3.38	0.003	VS
LDL	A	20	122.34	114.74	7.60	6.21	11.57	2.58	2.93	0.008	V.S
	B	20	107.45	98.65	8.80	8.18	8.085	1.808	4.869	0.0001	E.S
VLDL	A	20	28.15	24.54	3.60	12.78	4.21	0.942	3.82	0.001	V.S
	B	20	32.26	26.97	5.28	16.36	4.35	0.973	5.432	<0.0001	E.S

Inter Group Study**Table 4: Inter group Comparison of Sign and Symptoms of Subjective Criteria.**

Sign & symptoms	Groups	(AT) Mean	SD±	SE±	P	S
KshudraShwasa	A	0.5500	0.5104	0.1141	0.2725	NS
	B	0.9000	0.9119	0.2039		
Gaurava	A	0.6500	0.6708	0.1500	0.4275	NS
	B	0.8000	0.4104	0.0917		
Alasaya	A	0.4500	0.6048	0.1352	0.0191	S
	B	0.9000	0.8522	0.1906		
Angasada	A	0.6000	0.8208	0.1835	0.1149	NS
	B	0.8500	0.5871	0.1313		
Kshudhaadhikya	A	0.3500	0.5871	0.1313	0.4884	NS
	B	0.5000	0.6882	0.1539		
Pipasaadhikya	A	0.2500	0.7164	0.1602	0.7368	NS
	B	0.5500	0.9445	0.2112		
Swedaaadhikya	A	0.2000	0.4104	0.0917	0.3024	NS
	B	0.3500	0.4894	0.1094		
Atinidra	A	0.2500	0.6387	0.1428	0.1604	N.S
	B	0.6000	0.6806	0.1522		
Dourbalya	A	0.2000	0.6156	0.1376	0.1078	NS
	B	0.4500	0.6048	0.1352		
Kricchavyavayata	A	0.1000	0.4472	0.1000	0.1093	NS
	B	0.3500	0.4894	0.1094		

(ES: Extremely Significant VS: Very Significant S: Significant NS: Non Significant)

Table 5: Showing Effect of Inter Group comparisons in Anthropometric Profile -(Unpaired t- test).

Variable	Gr	(AT)Mean	SD±	SE±	t-value	P-value	Significance
Body weight	A	1.230	1.968	0.4400	1.375	0.1773	NS
	B	2.230	2.591	0.5793			
BMI	A	0.0630	2.602	0.5817	1.309	0.1985	NS
	B	0.8700	0.9143	0.2044			
Waist circumference	A	1.000	1.598	0.3573	0.0456	0.9638	NS
	B	1.022	1.371	0.3066			
Hip circumference	A	1.000	1.933	0.4323	0.9989	0.3242	NS
	B	1.778	2.895	0.6473			
W:H ratio	A	0.1590	0.4870	0.1089	1.209	0.2343	NS
	B	0.0220	0.1408	0.03148			
Bicep(SFT)	A	0.2675	0.4237	0.09473	0.8682	0.3908	NS
	B	0.4000	0.5351	0.1197			
Tricep(SFT)	A	0.1980	0.3270	0.0731	1.988	0.0541	Not quite significant
	B	0.4870	0.5619	0.1256			
Nape of the neck(sft)	A	0.0715	0.1263	0.02825	0.02948	0.9766	N.S
	B	0.0725	0.0839	0.0187			

Table 6: Showing Effect of Inter Group comparisons in Biochemical Profile-(Unpaired t- test).

Variable	Gr	(AT) Mean	SD±	SE±	t-value	P-value	S
Sr.cholesterol	A	10.655	14.711	3.289	0.4346	<0.0001	ES
	B	47.090	34.487	7.712			
Triglycerides	A	18.020	21.081	4.714	1.244	0.2212	NS
	B	26.449	21.774	4.869			
HDL	A	-0.9950	1.545	0.3455	2.778	0.0084	VS
	B	-6.078	8.034	1.797			
LDL	A	7.604	11.571	2.587	0.3800	0.7061	NS
	B	8.804	8.085	1.808			
VLDL	A	3.604	4.216	0.9428	0.1243	0.2214	NS
	B	5.289	4.355	0.9737			

Table 7: Overall Effect of Therapy.

Effect	Group-A		Group-B	
	No of patient	%	No of patient	%
No Improvement	04	20%	01	5%
Mild Imp.	12	60%	04	20%
Moderate Imp.	02	10%	02	10%
Marked Imp.	02	10%	10	50%
Complete Imp.	00	0%	03	15%

In Group A –Complete improvement was found in 0% of patients, while marked improvement in 10%, moderate improvement in 10% whereas 60% were found mild, 20% were found in no improvement, while in group B- complete improvement was found in 15% of patients, while marked in 50%, Moderate improvement in 10%, whereas 20% were found mild improvement, 5% were found no improvement.

Overall comparison of all the parameter showed that effect of Group-B was better than Group-A. It can be said that *Lekhan ghan vati with lekhan basti* is more effective to control all parameters due to its highly *Karshana*, *Lekhana* properties compare to *only lekhan basti*

DISCUSSION

Probable Mode of Action of *Lekhan ghan vati*

The trial drug "*Lekhan Ghana vati*" contains ten drugs described by *Acharya charaka* under the heading of "*Lekhaneeya Dashemani*". The properties of wholesome formulation of *Lekhaniya Mahakashaya* are as *Katu, Tikta Rasa, katuvipaka, Ushnavirya, Laghu, Tikshana, Rukshaguna*

Relevant actions of *Lekhaniya Mahakashaya* because of each one of these properties are as follows:-

Laghu guna is characteristic of drugs constituted of '*Vaayu and Agni Mahabhoota*'. Drugs, possessing this property produce lightness in the body and promote the *jatharagni*. Both of these actions help in reducing accumulation of *medodhaatu* in the body. *Tikshnaguna* is characteristic of drugs, constituted of *Agni mahabhoota*. These drugs perform action of *shodhana, lekhana* and

kapha-harakarma. Owing to the above mentioned properties, *Lekhniya Mahakashaya* is igneous in nature stimulates *jatharagni* and performs *lekhan karma* in the body.

When we look at characteristics and actions of contents of *Lekhniya Mahakashaya* individually, we find each of the contents contribute to *lekhan karma*. *Katuka* is '*pitta rechaka and pittavirechana*' (choleretic and cholagogue purgative drug)^[5] This drug excretes *pitta* (bile) which is required for the '*ahaarpaaka*' This results into depletion of *dhaatu*, mainly *Medo* and *Maansdhaatu*. By inducing *virechana*, it performs *shodhankarma* reducing *medo-dhatu* in the body. *Haridra* and *daruharidra* stimulate *agni* and performs *lekhana*^[6] *karma* because of their *katu-tikta* taste, *katuvipaka, ushnavirya* and *laghu, rukshaguna*. *Tikshanaguna* of *Vacha, chitrak* and *Kushtha* along with above mentioned characteristics aids more to *lekhan karma*. *Chirbilva* and *Haimvati* mainly perform *lekhan karma*^[7,8] on *dhaatu* and body because of their properties. Contrary to other contents of *Lekhniya Mahakashaya*, *Mustak* and *Ativisha* performs '*grahi*' *karma*,^[9,10] hence, they check the excessive motions caused by *Katuka*. *Grahi karma*, also helps re-absorption of water in large intestine reducing the risk of patient getting dehydrated because of loose motions. So, it is concluded that each of the content of the *Lekhniya Mahakashaya* contributes to make it an ideal hypolipidaemic formulation.

According to modern pharmacology *Katuki* and *Dauruharidra* have *cholagogue & choleretic* properties. so these drugs cause more bile acid excretion in intestines. *Mustaka* and *katuki* also contain beta-sterols. These non-absorbed plant sterols inhibit cholesterol absorption in intestines and increase

cholesterol excretion with feces .it results in increased intake of cholesterol to form bile acids in hepatocytes and the resultant up regulation of hepatic LDL receptors in turn lowers plasma LDL concentration by reverse cholesterol transport mechanism.

Binding agent *Guggulu* According to Acharya *Vagbhata guggulu* is having “*Medo-Anilharanama*”. Acharya *sushruta* also quoted its property of *lekhana* directly many researches proved to be Hypolipidaemic and antioxidant effects of *Commiphora Mukul* as an adjunct to dietary therapy in patients with hypercholesterolemic potent hypercholesterolaemic, anti-atherosclerotic agent.

Probable Mode of Action of *Lekhan basti*

As *Sthaulya*, is *Kapha-MedaPradhan* & with *Medasaavritta Vata*, Acharya Charak recommended *Ushna-Tiksha dravyas* for *Basti* & Acharya *Sushruta* mentioned *Lekhan Basti* in management of *Sthaulya*⁽¹¹⁾. *Lekhan Basti* has all its contents with *Rukshna*, *Tiksha*, *Laghu Gunas dominant*, *UshnaVirya*, *KatuVipaka* dominant & *KaphaVatahar* properties. With the *Samyaka* introduction of *Basti*, there is *Srotovishodhanas* along with *Deepan&Pachan* i.e normalisation of *Agni* at the level of *Jatharagni* & *Dhatwagni*. Thus helps in breakage of Pathogenesis of disease. All the properties of contents of *LekhanBasti* administered in this trial, helps in *Kapha-Medaharan*, *Karshana* of Excess *Medas* in the body & *Vatanuloman*, normalising the *Apanavayu* functions, thus controlling the functioning of rest *Vatadoshas*, thus helps to break pathogenesis of *Sthaulya*.

CONCLUSION

Sthaulya as described in *Ayurveda* texts can be correlated with the disease entity Obesity in modern medicine on the basic of etiological factors and their clinical manifestations.

In *Sthaulya* both *baddhameda* and *abaddhameda* contents of individual body are taken in consideration. The fat which is mobile and circulates in the body along with blood in the form of cholesterol ,triglycerides ,HDL ,LDL & VLDL etc. can be correlated with *Abaddhameda* (*poshkameda*) and the fat which is not mobile and is stored in the form of fat at various places (fat depots/muscles and omentum/adipose tissues) can be correlated with *Baddhameda* (*pushyameda*).

The percentage of relief was higher when a combination therapy in the form of *lekhna ghan vati* & *lekhana basti* simultaneously was administered to the patients of *Sthaulya* roga (obesity) in comparison to the administration of *Lekhna ghan vati* & *lekhana basti* separately. it can be concluded that, therapy in the form of administration of *Lekhan ghan vati* and *Lekhan Basti* separately or in combination is a safe and effective in the management of *Sthaulya* (obesity).

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