



A Clinical Study On Effect Of Guduchi Mustaadi Kwath And Shleshma Medohar Ahara And Vihara For The Management Of Sthaulya.

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Abstract

Background: Obesity is defined as a common chronic disorder of excessive body fat and has become a global epidemic which is present not only in the developed countries but also present in many developing and even in underdeveloped countries. A person having excessive growth of *Medodhatu* and *Mamsadhatu*, which results into pendulous appearance of buttocks, belly and breasts and whose increase bulk is not matched by corresponding increase in energy level. The present work has been planned to evaluate the effect of *Shleshma-Medohari Kriya* along with diet and lifestyle modifications in the management of *Sthaulya*.

Material and method: 30 patients having sign and symptoms of *Sthaulya* and fulfilling inclusion criteria were selected and divided into 2 groups. In group A, *Guduchi-Mustaadi Kwath*- 40 ml twice a day for 45 days along with *Shleshma-Medohara Ahara* and *Vihara* and in Group B, Placebo- 2 capsules (each cap.500 mg) twice a day for 45 days along with *Shleshma-Medohara Ahara* and *Vihara* was administered. Assessment was done on laboratory investigations - lipid profile (Sr. Cholesterol, Sr. Triglycerides, HDL, LDL, VLDL), Objective Criteria- Body weight, BMI, the girth measurements of neck, chest, abdomen, hip, mid arm and mid-thigh and the skin fold thickness. Subjective criteria- *Chala-Sphika-Udara-Stana*, *Angagandha*, *Swedadhikya*, *Kshudhadhikya*, *Pipasadhikya*, *Kshudra Shwasa* and *Nidradhikya*.

Result: Based on the data, Group A (*Guduchi-Mustaadi Kwath* and *Shleshma-Medohara Ahara* and *Vihara*) showed better percentage-wise outcomes in both subjective and objective criteria than Group B (*Placebo capsule* and *Shleshma-Medohara Ahara* and *Vihara*). No patients in groups A or B received a full recovery. In Group A, 40% of patients showed moderate improvement, and 60% of patients showed mild improvement; in Group B, 20% of patients showed mild improvement, while the remaining 80% of patients showed no change.

Conclusion: It can be concluded that due to the *Laghu*, and *Ruksha* property of the drugs, *Lekhana*, *Medohara*, and *Anulomana Karma Shleshma-Medohara Ahara* and *Vihara* is effective in management of *Sthaulya*

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Keywords: *Stholya*, *obesity*, *Shleshma-Medohara kriya*, *Guduchi-Mustaadi Kwath*

Introduction:

Obesity is defined as a common chronic disorder of excessive body fat and has become a global epidemic which is present not only in the developed countries but also present in many developing and even in underdeveloped countries.

Obesity is emerging as an important health problem in India. In present time obesity has become the most common disorder not only in affluent society but also in middle class society. Changes in the dietary habits and behavioural pattern and sedentary life may be the most probable cause for this disease. It is a key risk factor in natural history of other chronic and non-communicable diseases. Obesity has nearly tripled since 1975 according to W.H.O. In 2016, more than 1.9 billion adults, 18 years and older were overweight, out of these over 650 million were obese. In 2016, 39% of adults were overweight and 13% were obese. Most of world's population lives in countries where overweight and obesity kills more people than underweight. In 2020, 39 million children under the age of 5 years were obese or overweight. Over 340 million children and adolescents aged 5-19 were overweight or obese in 2016.

According to Ayurveda, the word "*Sthaulya*" derived from *Moola Dhatu* "*Stu*" with the addition of "*Ach*" *Pratyaya* respectively which means thick or solid or strong or big or bulky. A person having excessive growth of *Medodhatu* and *Mamsadhatu*, which results into pendulous appearance of buttocks, belly and breasts and whose increase bulk is not matched by corresponding increase in energy level. In short it can also be defined as "A person is unable to work actively due to extensive growth of fat and flesh and disfigured with pendulous buttocks, belly and breasts is called *Atisthula* and the condition is termed as *Ati-Sthaulya*".

Acharya Charaka described *Sthaulya* as *Santarpanjanya Vyadhi* and *Atisthula Purusha* has been considered as one of the *Ashtaunindita Purusha*. Acharya Sushruta further said that *Madhyama Sharira* is best but *Atisthula* and *Atikrisha* always have some complaints. According to Acharya Sushruta, *Rasadhatu* is responsible for *Sthaulya* and *Karshya*ⁱ. Qualities of *Ahara* like *Guru*, *Snigdha*, *Madhura*, *Sheeta*, *Manda* etc. increases the *Kapha* excessively and improperly formed *MedhoDhatu* which leads to further complications like *Sthaulya*.

Describing the principle of management of *Sthaulya*, Acharya Charaka has given emphasis on '*Guru Cha Atarpanam*' *Siddhanta*ⁱⁱ. As per this principle; patients suffering from *Sthaulya* should be treated with diet and medicines which are heavy and non-nourishing in nature. This principle of *Sthaulya Chikitsa* is so important that it has been applied at various contexts throughout the *Samhita*. As *Sthaulya* is a *Shleshma* and *Medodhatudushtjanya* disease, medicines having *Shleshma-Medohara*ⁱⁱⁱ properties and appropriate diet and lifestyle modifications are indicated in its management. Considering these aspects, the present work has been planned to evaluate the effect of *Shleshma-Medohari Kriya* along with diet and lifestyle modifications in the management of *Sthaulya*.

Methodology

The patients attending O.P.D. of Basic Principles Department, I.T.R.A. Having sign and symptoms of *Sthaulya* were selected without any consideration of religion, sex, caste, occupation etc. Informed consent was taken from each patient before enrolling them in the trial. Institutional Ethics Committee (IEC) approval was taken prior to initiation of research work vide its letter no. PGT/7/-A/Ethics/2021-22/1424 (19). Study was registered in Clinical Trial Registry of India with no. CTRI/2022/01/039386.

Study type and design: It is an open labeled randomized comparative interventional clinical trial.

Participants: Inclusion Criteria included patients between the age group of 20 years to 60 years having four or more classical signs and symptoms of *Sthaulya* described in classical texts i.e., *Chala-Sphika-Udara-Stana*, *Angagandha*, *Swedadhikya*, *Kshudhadhikya*, *Pipasadhikya*, *Kshudra Shwasa* and *Nidradhikya*. Patients with BMI more than 25 kg/m² were included in the study and Dyslipidemia (according to National Cholesterol Education Program Adult Treatment Panel 3) was selected as modern objective parameter. Detailed clinical history was taken on specially prepared research proforma and filled in the record of B.T. and A.T. data for the statistical study.

Exclusion Criteria included age of patient less than 20 years and more than 60 years. Patients having major illness like cardiac diseases etc. & also the involvement of other systemic disorders. Patients having *Sthaulya* due to genetics, pregnancy, drug induced, Cushing's syndrome, hypothyroidism and due to other hormonal disorders. Known case of polycystic ovarian disease.

Sample size: 15 patients were enrolled in each group.

Grouping: Patients were randomly divided into below mentioned 2 groups by computerized randomization method:

- **Group A:** *Guduchi-Mustaadi Kwath*- 40 ml twice a day for 45 days.
Shleshma-Medohara Ahara and *Vihara*.
- **Group B:** Placebo- 2 capsules (each cap.500 mg) twice a day for 45 days
Shleshma-Medohara Ahara and *Vihara*.

Diet plan for both groups:

Patients were advised to follow this diet plan for 45 days with treatment and after that patients were advised to continue this diet plan with *Vyayama*.

Table no. 1: Diet plan to treatment

<i>Pathyapathya</i>	Items	Do's
<i>Ahara</i>	<i>Shook Dhanya</i>	<i>Purana Shali, Yava + Purana Godhuma</i>
	<i>Shimbi Dhanya</i>	<i>Mudga, Chanaka</i>
	<i>Shaka Varga</i>	<i>Patola, Karvellaka, Shigru, The leafy vegetables</i>
	<i>Phala Varga</i>	<i>Jambu, Dadima, Amalaki, Tinduka, Kalinga</i>
	<i>Mamsa Varga</i>	<i>Vishkira Mamsa</i>
	<i>Taila Varga</i>	<i>Sarshapa, Atasi</i>
	<i>Kritanna Varga</i>	<i>Saktu, Yusha, Yavodana, Vatya</i>

Patients were advised to restrict food having *Guru, Sanigdha, Madhura, Sheeta, Manda* properties.

Pathya Vihara- Wake up before sunrise, *Vyayama* (Exercise and *Yogic Vyayama*- as per the *Aturabala*), *Suryanamaskara*: 3-6 rounds, *Vajrasana*: 5-10 mins (After meal), *NadiShuddhi Pranayama*: 3-6 rounds, Walking: 1-5 kms as per *Aturabala*. These exercises were advised continuously along with medications for 45 days.

Apathya Vihara- Restrict day sleep, avoid lying down immediately after food and in supine position, Avoid addictions such as smoking, alcohol etc.

Criteria for assessment:

1. Laboratory investigations - Lipid profile (Sr. Cholesterol, Sr. Triglycerides, HDL, LDL, VLDL)
2. Objective Criteria- Body weight and BMI before starting the treatment and after completion of the treatment in terms of percentage relief and statistical evaluations. The girth measurements of neck, chest, abdomen, hip, mid arm and mid thigh using measuring tape before and after the treatment were taken into consideration. The effectiveness of therapy on body fat was assessed by measuring the skin fold thickness by Vernier caliper.
3. **Subjective criteria:**

Table no. 2: Grading for subjective criteria

Bharavridhi:

0	Appropriate weight as per height weight ratio
1	1-33% more weight as per height weight ratio
2	34-66% more weight as per height weight ratio
3	>66% more weight as per height weight ratio

The percentage of weight for gradation has been calculated by percentage of ratio by subtracting ideal weight from the present weight as per the standard height weight ratio.

Chala-SphikaUdaraStana:

Grade	Description
0	Absence of <i>Chalatva</i> (movement)
1	Little visible movement (in the areas) even after moderate movement
2	visible movement (in the areas) after mild movement
3	Movement (in the areas) even after changing posture

Angagaurava (heaviness in body):

Grade	Description
0	No heaviness in body
1	Feels heaviness in body but it does not hamper routine work
2	Feels heaviness in body which hamper routine work
3	Feels heaviness with flabbiness in all over body which hamper the movement of the body

Ayathopachaya (Improper distribution of fat)

Grade	Description
0	<i>Yathavat Upachaya</i> (normal distribution)
1	<i>Ayathopachaya</i> seen at only one organ (e.g., <i>Udara</i>)
2	<i>Ayathopachaya</i> seen at two organs (e.g., <i>Udara</i> and <i>Sphik</i>)
3	<i>Ayathopachaya</i> seen at three or more organs (<i>Udara</i> , <i>Sphik</i> , <i>Stana</i>)

Daurgandhya (Body Oduor):

Grade	Description
0	Absence of bad smell
1	Occasional bad smell from the body which removed after bathing
2	Persistent bad smell limited to close areas difficult to suppress with deodorants
3	Persistent bad smell felt from long distance even intolerable to the patient himself

Atikshudha (Excess hunger):

Grade	Description
0	Normal hunger (feel hunger) at 6-8 hours after taking food
1	Feel hunger after 5-6 hours of taking food
2	Feel hunger after 4-5 hours of taking food
3	Feel hunger after 3-4 hours of taking food

Atipipasa (Excess thirst):

Grade	Description
0	Normal thirst (1 ½ -2 liters intake water at normal temperature)
1	2 to 3 liters intake of water
2	3 to 4 liters intake of water
3	More than 4 liters intake of water

Kshudrashwasa (Dyspnea on Exertion):

Grade	Description
0	Dyspnea after heavy work (movement) but relieved within 5 minutes and up to tolerance
1	Dyspnea after moderate work but relieved later and up to tolerance
2	Dyspnea after little work but relieved later and up to tolerance
3	Dyspnea after little work but relieved later and beyond tolerance

Swedadhikya (at normal temperature in normal condition) (Excess sweating):

Grade	Description
0	Sweating after heavy work and fast movement or in hot season
1	Profuse sweating after moderate work and movement
2	Profuse sweating after little work and movement
3	Sweating even at rest or in cold season

Nidradhikya (Excess sleep):

Grade	Description
0	Normal sleep 6-7 hrs. per day
1	Sleep up to 8 hours/day with <i>Angagaurava</i>
2	Sleep up to 8 hours/day with <i>Angagaurava</i> , <i>Jrimbha</i> and <i>Tandra</i>
3	Sleep more than 10 hours/day with above symptoms and <i>Klama</i>

Observation

Demographic data: The study was carried out within two groups, 15 patients were enrolled in each group and all the patients have completed their treatment. 73.33% patients were females where as 26.67% were males. 50.00% patients were belonging to Age group of 20-30 years, 33.33% patients belong to Age group of 31-45 year, 16.67% of patients belong to Age group of 45-60 years. 40.00% of patients were graduate, 20.00% had secondary education, 13.33% were studied up to higher secondary standard, 16.67% were post graduated and 10.00% were primary educated. 36.67% patients were of lower middle class, 30% were of middle class and 33.33% were of upper middle class of socio-economic status.

Diseases condition: The present study shows that all patients developed disease gradually & the course of disease was progressive. 46.67% patients had family history of diabetes mellitus and 33.33% had family history of hypertension. All the patients had complaints of *Bharvridhi*, 80.00% had *Angagauravata*, 50.00% had *Ayathaupchaya*, 66.67% had *Atikshudha*, 23.33% had *Atipipasa*, 56.67% had *Kshudrashwasa*, 23.33% had *Chalsphikudarastana*, 23.33% had *Daugandhya* 53.33% had *Swedadhikya*, 86.67% had *Nidraadhikya*.

Relevant personal history: All the patients enrolled in the study were taking *Madhura-Amla Rasa* dominant diet, 60% patients were taking *Lavana Rasa* dominant diet, 50.00% were taking *Katu Rasa* dominant diet and 26.67% were taking *Tikta Rasa* dominant diet. All the patients were taking *Guru Ahara*, *Snigdha Ahara*, and 70.00% were taking *Ushna Ahara*, 30.00% were taking *Sheeta Ahara*. 23.33% of the patients don't had habit of eating between meals and 76.67% patients had habit of occasionally eating between meals. 53.33% patients had *Tikshnagni*, and 46.67% *Vishmagni*. 70.00% patients had the history of *Adhyashana*, 30.00% patients had history of *Vishamashana*. 70.00% had *Santushta Mala Pravriti* while remaining 30.00% had *Asantushta Mala Pravriti*. 76.67% patients had *Alpasamhita* while remaining 23.33% had *Kathina Mala Pravriti* and 100.00% patients had normal smell *Mala Pravriti*.

Result:

Statistical calculations was done with the help of Sigma stat 3.5 software. Data was analysed by using paired 't' test, unpaired 't' test, Wilcoxon's sign Rank test, Mann-Whitney test as well as percentage of the results. The results were interpreted as: Significant $p < 0.05$, Highly Significant $p < 0.001$, Insignificant $p > 0.05$. Wilcoxon Signed Rank test was applied to paired data of subjective criteria (scoring of chief complaints like *Bharvridhi*, *Chaludarsphikstana*, *Ayathaopachaya* etc.) and Mann-Whitney test was applied to unpaired data of subjective criteria. Paired t-test was applied to paired data of objective criteria (like weight, BMI, girth measurements, skin fold thickness etc) and Un-paired t-test was applied to unpaired data of objective parameters.

Table 3: Effect of therapy on chief complains and associated complains in group A by using Wilcoxon signed-rank test (N=15)

Chief Complaint	Mean		Relief %	W (-)	P	R
	BT	AT				
<i>Bharvridhi</i> (n=15)	2.33	1.67	28.32%	55.00	0.002	S
<i>Chal-Udarsphikstana</i> (n=3)	1.33	0.33	75.18%	6.00	0.250	IS
<i>Angagauravata</i> (n=14)	1.78	0.78	56.18%	105.00	<0.001	HS
<i>Ayathaopachaya</i> (n=9)	2.11	1.67	20.85%	10.00	0.125	IS
<i>Daugandhya</i> (n=2)	1.00	0.00	00%	3.00	0.500	IS
<i>Atikshudha</i> (n=8)	1.75	0.62	64.57%	36.00	0.008	S
<i>Atipipasa</i> (n=3)	2.0	1.0	50.00%	6.00	0.250	IS
<i>Kshudrashwasa</i> (n=11)	1.71	0.71	58.47%	55.00	0.002	S
<i>Swedadhikaya</i> (n=9)	1.00	0.20	80.0%	45.00	0.004	S
<i>Nidradhikaya</i> (n=12)	2.00	1.00	50.0%	78.00	<0.001	HS

In the present clinical study, in group-A statically significant results were observed in *Bharvridhi*, *Angagauravata*, *Atikshudha*, *Kshudrashwasa*, *Swedadhikaya*, and *Nidradhikaya* while for *Chal-Udarsphikstana*, *Ayathaopachaya*, *Daugandhya*, *Atipipasa* results were statistically insignificant.

Table no. 4- Effect of therapy on chief complains and associated complains in group B by using Wilcoxon signed-rank test (N=15)

Chief Complaint	Mean		Relief %	W (-)	P	R
	BT	AT				
<i>Bharvridhi</i> (n=15)	2.13	2.06	03.28%	1.0	1.000	IS
<i>Chal Udarsphikstana</i> (n=4)	2.50	2.25	10.00%	1.00	1.000	IS
<i>Angagauravata</i> (n=11)	1.72	1.45	15.70%	6.0	0.250	IS
<i>Ayathaopa-chaya</i> (n=6)	2.50	2.50	00%	0.00	1.000	IS
<i>Daurgandhya</i> (n=3)	1.00	1.00	00%	0.00	1.000	IS
<i>Atikshudha</i> (n=12)	1.67	1.33	20.35%	10.00	0.125	IS
<i>Atipipasa</i> (n=4)	2.00	1.75	12.5%	1.00	1.000	IS
<i>Kshudra shwasa</i> (n=6)	1.50	1.00	33.33%	6.0	0.250	IS
<i>Swedadhikaya</i> (n=7)	1.28	1.00	21.87%	3.0	0.500	IS
<i>Nidradhikaya</i> (n=14)	1.93	1.14	40.93%	66.0	<0.001	HS

In group-B statically significant result was observed in *Nidradhikaya* and for rest of the symptoms i.e., *Bharvridhi*, *Chal-Udarsphikstana*, *Angagauravata*, *Ayathaopachaya*, *Daurgandhya*, *Atikshudha*, *Atipipasa* and *Kshudrashwasa*. Results are statistically insignificant

Table no. 5- Comparative effect of the therapies on chief complaints and associated complains by using Mann-Whitney test (N=30)

Chief Complain	Relief %		Mann Whitney U	P	R
	Gp-A	Gp-B			
<i>Bharvridhi</i> (n=30)	28.32%	03.28%	45.00	<0.001	HS
<i>Chal Udarsphikstana</i> (n=7)	75.18%	10.00%	97.50	0.307	IS
<i>Angagauravata</i> (n=25)	56.18%	15.70%	30.00	<0.001	HS
<i>Ayathaopachaya</i> (n=15)	20.85%	00%	82.50	0.038	IS
<i>Daurgandhya</i> (n=5)	00%	00%	97.50	0.164	IS
<i>Atikshudha</i> (n=20)	64.57%	20.35%	80.50	0.128	IS
<i>Atipipasa</i> (n=6)	50.00%	12.5%	97.50	0.307	IS
<i>Kshudrashwasa</i> (n=17)	58.47%	33.33%	60.00	0.012	S
<i>Swedadhikaya</i> (n=16)	80.0%	21.87%	60.00	0.010	S
<i>Nidradhikaya</i> (n=26)	50.0%	40.93%	105.00	0.692	IS

Table shows statistically significant difference in *Bharvridhi*, *Angagauravata*, *Kshudrashwasa*, and *Swedadhikaya* while all other subjective parameters show insignificant difference between the groups.

Table no. 6- Effect of treatment on body circumferences in Group-A: Paired 't' test (N=15)

Circumference	Mean Diff.	Relief %	SD	SEM	t	P	R
Mid arm	1.567	4.68%	1.208	0.312	5.022	<0.001	HS
Fore arm	0.033	0.13%	0.129	0.033	1.000	0.334	IS
Chest	1.533	1.44%	1.586	0.410	3.743	0.002	S
Abdomen	2.767	2.70%	0.776	0.200	13.80666666	<0.001	HS
Hip	1.333	1.16%	0.724	0.187	7.135	<0.001	HS
Mid-Thigh	1.400	2.47%	0.604	0.156	8.984	<0.001	HS

Above table shows that, in group A after treatment the decrease in circumferences of various body parts i.e., abdomen, hip, mid arm, mid-thigh, neck and chest, are statically significant, and for fore arm result is statically insignificant.

Table no. 7- Effect of treatment on body circumferences in Group-B: Paired 't' test (N=15)

Circumference	Mean Diff.	Relief %	SD	SEM	T	P	R
Neck	0.00	0.00%	0.000	0.000	0.000	1.000	IS
Fore arm	0.000	0.00%	0.000	0.000	0.000	1.000	IS
Chest	0.133	0.11%	0.229	0.059	2.256	0.041	S
Abdomen	0.367	0.33%	0.442	0.114	3.214	0.006	S
Hip	0.267	0.26%	0.320	0.082	3.228	0.006	S
Mid-Thigh	0.133	0.25%	0.299	0.059	2.256	0.041	S

Above table shows that after treatment in group-B, the decrease in circumferences of various body parts i.e., hip, abdomen, mid-thigh, chest and mid arm are statistically significant. For neck and fore arm circumferences results are statistically insignificant.

Table no. 8- Comparative effect of both therapies on body circumferences by using Unpaired t-test (N=30)

Circumference	Relief %		Mean Diff.	t	P	R
	Group-A	Group-B				
Neck	2.30%	0.88%	0.367	6.205	<0.001	HS
Mid arm	2.97%	0.54%	1.434	4.515	<0.001	HS
Fore arm	3.47%	0.94%	0.033	1.000	0.326	IS
Chest	2.25%	0.61%	1.400	3.383	0.002	S
Abdomen	3.21%	1.05%	2.400	10.408	<0.001	HS
Hip	3.02%	1.10%	1.066	5.221	<0.001	HS
Mid-Thigh	2.86%	0.89%	1.267	7.600	<0.001	HS

The effects of *Guduchi-Mustaadi Kwath* and Placebo Capsule on the circumferences of various body parts have been summarized in the above table which shows significant difference on neck, mid-arm, abdomen, hip, chest and mid-thigh while insignificant results for fore-arm circumference.

Table no. 9- Effect of treatment on skin fold thickness in Group-A: Paired 't' test (N=15)

Skin fold	Mean		Mean Diff.	Relief %	SD	SEM	T	P	R
	BT	AT							
Biceps	25.096	24.423	0.673	2.68%	0.254	0.065	10.268	<0.001	HS
Triceps	29.211	28.987	0.224	0.76%	0.059	0.015	14.581	<0.001	HS
Abdomen	33.120	32.636	0.484	1.46%	0.219	0.056	8.547	<0.001	HS
Sub scapular	26.946	26.835	0.111	0.41%	0.049	0.012	8.610	<0.001	HS

Above table shows that after treatment the decrease in skin fold thickness of various body parts in group-A and results are statistically significant.

Table no. 10- Effect of treatment on skin fold thickness in Group-B: Paired 't' test (N=20)

Skin fold	Mean		Mean Diff.	Relief %	SD	SEM	t	P	R
	BT	AT							
Biceps	25.980	25.928	0.052	0.23%	0.0513	0.013	3.926	0.002	S
Triceps	29.211	28.987	0.224	0.17%	0.059	0.015	14.581	<0.001	HS
Abdomen	32.234	32.195	0.038	0.14%	0.028	0.007	5.301	<0.001	HS
Sub scapular	23.861	23.838	0.022	0.11%	0.024	0.006	3.564	0.003	S

Above table shows that after treatment the decrease in skin fold thickness of various body parts in group-B and Results are statically significant.

Table no. 11- Comparative effect of both therapies on skin fold thickness by using Unpaired t-test (N=30)

Skin fold	Relief %		Mean Diff.	t	P	R
	Group-A	Group-B				
Biceps	2.68%	0.23%	0.621	9.286	<0.001	HS
Triceps	0.76%	0.17%	0.000	9.710	<0.001	HS
Abdomen	1.46%	0.14%	0.446	7.800	<0.001	HS
Sub-scapular	0.41%	0.11%	0.089	6.136	<0.001	HS

The effects of *Guduchi-Mustaadi Kwath* and Placebo Capsule on the skin fold thickness of various body parts have been summarized in the above table which shows statically highly significant difference in skin fold thickness between two groups.

Table no. 12- Effect of treatment on weight and BMI in Group-A: Paired 't' test (N=15)

Parameter	Mean		Mean Diff.	Relief %	SD	SEM	t	P	R
	BT	AT							
Weight	81.000	74.800	6.200	7.72%	1.761	0.455	13.638	<0.001	HS
BMI	32.613	29.853	2.760	8.46%	1.286	0.332	8.315	<0.001	HS

The table portrays that after treatment reduction in weight in group-A was 7.72% while BMI was reduced by 8.46%. All results were significant.

Table no. 13- Effect of treatment on weight and BMI in Group-B: Paired 't' test (N=15)

Parameter	Mean		Mean Diff.	Relief %	SD	SEM	t	P	R
	BT	AT							
Weight	78.400	76.133	2.267	3.12%	0.729	0.188	12.0488	<0.001	HS
BMI	32.273	31.260	1.013	3.35%	0.378	0.097	10.39	<0.001	HS

The table portrays that after treatment reduction in weight in group-B was 3.12% while BMI was reduced by 3.35%. All results were significant.

Table no. 14- Comparative effect of both therapies on weight and BMI by using Unpaired t-test (N=30)

Parameter	Relief %		Mean Diff.	t	P	Remark
	Group-A	Group-B				
Weight	7.72%	3.12%	3.933	7.995	<0.001	HS
BMI	8.46%	3.35%	1.747	5.049	<0.001	HS

The effects of *Guduchi-Mustaadi Kwath* and Placebo Capsule on body weight and BMI have been summarized in the above table which shows significant difference between two groups.

Table no. 15-Effect of treatment on lipid profile in Group-A: Paired 't' test (N=15)

Parameter	Mean Diff.	Relief %	SD	SEM	t	P	R
S. Cholesterol	50.200	21.42%	36.828	9.509	5.279	<0.001	HS
S. Tg	40.200	24.61%	35.066	9.054	4.440	<0.001	HS
S. LDL	15.240	13.45%	15.031	3.881	3.927	0.002	S
S. VLDL	7.933	26.19%	7.828	2.021	3.925	0.002	S
S. HDL	10.360	19.02%	10.016	2.586	4.006	0.001	S

The table portrays that in group A after treatment reduction in biochemical parameters results are statically significant for S. cholesterol, S.Tg, S.LDL, S.VLDL, S.HDL.

Table no. 16- Effect of treatment on lipid profile in Group-B: Paired 't' test (N=15)

Parameter	Mean Diff.	Relief %	SD	SEM	T	P	R
S. Cholesterol	9.133	5.54%	16.673	4.305	2.122	0.052	IS
S. Tg	0.333	0.73%	24.758	6.392	0.052	0.959	IS
S. LDL	0.100	0.67%	16.806	4.339	0.023	0.982	IS
S. VLDL	-0.453	-4.67%	6.528	1.686	-0.269	0.792	IS
S. HDL	1.567	2.02%	6.322	1.632	0.960	0.353	IS

The table portrays that in group B after treatment changes in biochemical parameters, results are statistically insignificant for S. Cholesterol, S.Tg, S.LDL, S.VLDL and S.HDL.

Table no. 17: Comparative effect of both therapies on LIPID PROFILE by using Unpaired t-test (N=30)

Parameter	Relief %		Mean Diff.	t	P	R
	Group-A	Group-B				
S. Cholesterol	21.42%	5.54%	41.067	4.176	<0.001	HS
S. Tg	24.61%	0.73%	39.867	3.597	0.001	S
S. LDL	13.45%	0.67%	15.140	2.601	0.015	S
S. VLDL	26.19%	-4.67%	8.386	3.187	0.004	S
S. HDL	19.02%	2.02%	8.793	2.875	0.008	S

The effects of *Guduchi-Mustaadi Kwath* and Placebo Capsule on serum lipid concentration have been summarized in the above table. Results are statically insignificant for lipid profile.

Table no. 18: Overall effect of both therapies:

Overall effect	Group A		Group B	
	No. of patient	%	No. of patient	%
Complete remission (100%)	0	0	0	0
Marked improvement (76%-99%)	0	0	0	0
Moderate improvement (51%-75%)	6	40%	0	0
Mild improvement (26%-50%)	9	60%	3	20%
Unchanged (<25%)	0	0	12	80%

Effect of therapy in group A, Moderate improvement in 6 (40%) of patients, and mild improvement in 9 (60%) of patients were found. Effect of therapy in group B, Mild improvement found in 3 (20%) of patients, and 12 (80%) patients remained unchanged.

DISCUSSION

Sthaulya is one of the diseases that develops as a result of excessive dietary intake (*Santarpanajanya*). *Apatarpana Chikitsa* is the guiding principle of treatment for *Santarpanajanya Vyadhi*. The two varieties of *Apatarpana Chikitsa* i.e., *Shodhana* and *Shamana*, may also be distinguished. *Shleshma-Medohari Kriya* can be considered under *Shanshamana Chikitsa* for *Sthaulya*. The *Shleshma-Medohari Kriya* is performed by any *Ahara Dravya*, *Aushadha Dravya* or *Vihara*, and it has qualities like *Rukshata* and *Laghuta*. By virtue of its *Ruksha* quality, the *Shleshma-Medohari Kriya* leads the body to diminished excess *Meda*, *Mamsa*, and *Shoshana* of *Drava Dhatu* or *Kleda*.

Effect of therapy on objective parameters: There is statistically highly significant difference ($p < 0.001$) in the effect of therapies in group A and group B on Weight and BMI. Reduction in body weight and BMI depends upon the proportion of fat. Fat is 1.5 times heavier than lean body mass and occupies more area in the body. So, when the proportion of fat increases simultaneously body weight and BMI also increases. The *Lekhana Karma* and *Ruksha* property of the *Guduchi-Mustadi Kwatha* with *Shleshma-Medohari Ahar-Vihar* medicines was explained by *Laghu Bhojana* and *Vyayama*, which caused *Apatarpana* and a greater percentage decrease in group A. *Lekhana Karma* causes the scraping of *Meda* and *Mamsa Dhatu*, which results in a loss of mass for both *Meda* and *Mamsa*. Reduced mass causes a decrease in weight, and at the same time, the *Ruksha* property reduces *Kleda* by absorbing energy, aiding in weight loss. BMI also falls with weight loss. As accumulated excess fat, weight and BMI decreases, and circumferences of different body parts ultimately decreases. When results of both groups were compared, in group A results are better than result in group B.

Effects on subjective criteria

Bharvridhi- In patients treated with Group A (*Guduchi-Mustadi Kwatha* with *Shleshma-Medohari Ahar-Vihar*) decrease in *Bharvridhi* was 28.32% i.e., statically significant while in group B (Placebo capsule & *Shleshma-Medohari Ahar-Vihar*) decrease in *Bharvridhi* was 3.28% i.e., also statically non-significant. On comparison between two groups statically highly significant difference was observed. It is due to as weight found decreased in both the groups but in control group there was no any medication due to which there is not significant decrease in the weight.

Angagauravata- *Guru Guna* is mainly responsible for *Angagaurava*. It is also causative factor for *Ama* production due to *Kapha* vitiation. This results in *Gauravata* of *Rasa* and *Meda Dhatu* which produce *Gurugatrata* or heaviness in body. *Tikshna*, *Ushna* and *Ruksha Guna* of the *Shleshma-Medohar Aushadha* i.e., *Guduchi-Mustadi Kwatha* help to subside *Gauravata* by clearing *Srotorodha*. *Shleshma-Medohar Ahara* and *Vihara* also produce *Laghuta* which diminish *Gauravata*. Thus, *Shleshma-Medohar Aushadha*, *Ahara* and *Vihara* also give results in *Angagauravata*.

Atikshudha and Atipipasa- Excessive appetite in fatty people is a result of *Tikshana Agni*, which is brought on by the presence of too much *Vayu* in *Koshtha* as a result of *Vayu's Margavrodha* by *Meda*^{iv}. Affected *Agni* returned to normal, and extreme hunger subsided as a result of *Apatarpana's* removal of the *Vayu* obstruction caused by *Meda*.

Kshudrashwasa - that there is significant difference ($p = 0.012$) in the effect of therapies in group A & B. *Kshudrashwasa* is symptom of increased *Medo Dhatu*^v, after treatment with *Guduchi-Mustaadi Kwath* and

Shleshma-Medohara Ahara and *Vihara* increased *Medo Dhatu* reduced to normalcy because of which improvement was seen in *Kshudrashwasa*.

Chal Udarsphikstana- Visible movement in hip, abdomen and breast is the symptom of increased *Medo Dhatu*^{vi}. After *Guduchi-Mustaadi Kwath* and *Shleshma-Medohara Ahara* and *Vihara Medo Dhatu* and *Kapha* got reduced that leads to reduction in *Chala Udarashpikastana*.

Swedadhikaya- *Sweda* is the byproduct of *Medo Dhatu*, and excessive perspiration is a result of increased *Medo Dhatu*^{vii}. Excess *Medo Dhatu* reaches its optimal level after *Guduchi-Mustaadi Kwath*, *Shleshma-Medohara Ahara*, and *Vihara*, which causes a decrease in the body's excessive sweating (*Swedadhikaya*)^{viii}.

Daurgandhya- This symptom of *Daurgandhya* were present in very few subjects that's why the difference is not significant. *Sweda* is the *Mala* of *Meda*. After reduction in *Medo Dhatu* by *Guduchi-Mustaadi Kwath* and *Shleshma-Medohara Ahara* and *Vihara* its *Mala* i.e., *Sweda* also reduced and that reduces *Sharira Daurgandhya*^{ix}.

Nidradhikaya- Increased *Kapha* and *Meda* cause *Nidradhikaya* in fat individuals^x. After *Guduchi-Mustaadi Kwath* and *Shleshma-Medohara Ahara* and *Vihara*, *Kapha* and *Medo Dhatu* decreased to their ideal levels, and the effects of *Nidradhikaya* were lessened.

Mode of action of Guduchi-Mustadi Kwatha: The mode of action of *Guduchi-Mustadi Kwatha* on *Sthaulya* can be explained as follows- Among all ten ingredients of *Guduchi-Mustadi Kwatha* most are having *Katu*, *Tikta* and *Kashaya Rasa*, that have impact on the *Agni*, as *Katu Rasa* have *Deepana* and *Pachana*^{xi} effect and *Tikta Rasa* have *Pittashamaka* effect^{xii} on vitiated *Pitta* due to which *Swedadhikya*, *Daurgandhya*, *Atipipasa* and *Atikshudha* were improved; while *Kashaya Rasa* have *Dhatushoshana* effect^{xiii}. *Laghu* and *Ruksha Guna* make up the majority of medications according to the *Guna* system. The ability of *Laghu Guna* to make the body feel lighter. Additionally, it reduces the overabundance of the *Apakva Rasa* and *Meda Dhatu*, which are largely to blame for *Bharavridhi*, *Aalasya*, and *Angagauravata*. The *Kapha Dosha*, which plays a major role in *Santarpanjanya Vyadhi*^{xiv}, is primarily what *Ruksha Guna* works to counteract.

Ushna Virya boosts the medicine's efficacy and decrease *Kapha*, *Rasa*, and *Meda* in the *Guduchi-Mustadi Kwatha* drug combination, which comprises balanced *Virya* conditions. The majority of medications in the category of the *Vipaka* contain *Katu Vipaka*, which is *Kapha Shamaka* and also breaks down *Vayu's Aavarana*. The combination has the following effects on the *Dosha*: *Vatanulomana*, *Kledashoshana*, *Pittashamaka*, and *Koshtha Shuddhikara*. These effects finally have the impact of *Srotoshudhhikara* and cure the pathology of *Sanga* and *Atipravritti*. As a result, it reduces the amount of *Malarupa Kapha* and *Meda* while modulating the *Vata Gati*. As a result, the metabolism finally picks up speed, especially for the accumulated impurities or *Dosha*. The symptoms of *Sthaulya* diminish as a result, and all *Dhatu* will receive the proper nutrients necessary for *Annarasa* to form properly.

Conclusion:

In the current study, sedentary lifestyle, lack of exercise, consumption of *Madhura* and *Amla Rasa* dominant *Ahara*, *Snigdha*, *Shita*, and *Guru Guna* dominant *Ahara*, *Adhyashana*, and *Vishamashana*, consumption of water after meals, and habit of *Divaswapa* after meals were the main causes of *Sthaulya* in the majority of patients. Group A was statistically extremely significant in *Angagauravata* and *Nidradhikaya*, whereas *Bharvridhi*, *Atikshudha*, *Swedadhikaya*, and *Kshudrashwasa* shown significant results as a result of the usage of *Guduchi-Mustaadi Kwath* with *Shleshma-Medohara Ahara* and *Vihara*. Due to the *Lekhana*, *Medohara*, and *Anulomana Karma*, *Laghu*, and *Ruksha* property of the drugs, statistically highly significant results were found in Group A in objective parameters such as weight and B.M.I. No patients in groups A or B received a full recovery. In Group A, 40% of patients showed moderate improvement, and 60% of patients showed mild improvement; in Group B, 20% of patients showed mild improvement, while the remaining 80% of patients showed no change.

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