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Research Article

A CLINICAL AND LABORATORY PROFILE OF *STHAULYA* W.S.R TO OBESITY AND ITS MANAGEMENT BY *AMRITADYA GUGGULU*

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ABSTRACT

In *Ayurveda*, it is regarded as *Medoroga* which includes fat tissue and fat metabolism, results from the excessive accumulation of *Meda* (fat/ adipose tissue) and *Mamsa* (flesh/ muscle tissue) leading to flabbiness of hips, abdomen, and breast. It is considered as *Santarpanottha Vikara* and counted one among the *Ashtnindita Purusha* by Ayurvedic *Acharayas.* According to Ayurveda, *Sthoulya* begins with an imbalance of *Doshas* (*Vata*, *Pitta* and *Kapha*), *Agni* (digestive fire), *Malas* (waste products) or an imbalance of *Srotas* (microcirculatory channels). This collection of imbalances then interferes with the formation of tissues or *Dhatus* and leads to a tissue imbalance that we experience as *Sthoulya*. It is most prevailing condition being faced by majority of the population, but yet among the most neglected health problem in the world. In this regard approach of this study is to give safer, comprehensive and rational option for treating *Sthaulya* (Obesity) and this is a humble attempt to probe into the different pathophysiological aspects behind *Sthaulya*, taking into consideration the classical therapy coupled with modern interpretations. *Amritadya Guggulu* by the virtue of its *Rasapanchaka* (*Rasa- Katu, Tikta, Kashaya, Guna- Laghu, Ruksha* and *Virya- Ushna*, *Vipaka- Katu, Dosha Karma- Kapha Vatashamaka)* is effective in the management of *Sthoulya* including all *Kapha* predominant pathologies, leading to *Samprapti Vigatana* of *Sthoulya*. Hence this study is carried out to establish the efficacy of the treatment considering the clinical and laboratory profile of obesity (*Sthoulya*). The study was done on 30 patients taken from both IPD & OPD of RGGPG Ayurvedic College and Hospital, Paprola, H.P. The duration of the trial was 60 days with follow up of 15 days and the observations obtained are analyzed statistically after the end of the study.

INTRODUCTION

In Ayurveda, the equilibrium of various structural and functional units of the body named as *Dosha, Dhatu, Mala, Agni* and more important the mind, results in health and disequilibrium causes disease. *Meda* or fat is one of these *Dhatus*, which serves many purposes, important of which is to create and maintain body heat, protects delicate structure of our body from any injury etc.

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It gives necessary supports to skeletal structure of our body and brings about necessary form or shape to our body. Obesity (*Sthaulya*) is the commonest nutritional disorder in affluent societies and mostly prevalent in developed countries. In 2016, more than 1.9 billion adults, 18 yrs and older, were overweight. Of these over 650 million were obese. 39 million children under the age of 5 were overweight or obese in 2020. The prevalence of obesity nearly tripled between 1975 and 2016.[1] The 2030 Agenda for Sustainable development recognizes NCDs as a major challenge for sustainable development. As a part of the Agenda, Heads of the state and government committed to develop ambitious national response, by 2030, to reduce by one third premature mortality from NCDs through prevention and treatment. The "Global action plan on physical activity 2018-2030: more active

people for a healthier world" provides effective and feasible policy actions to increase physical activity globally.[2] Body mass index (BMI) is a simple index of weight for height that is commonly used to classify overweight and obesity in adults, defined as a person's weight in kilograms divided by the square of his heights in meters. Classification of Weight Status and Risk of Disease is as: (Harrison Principles of Internal Medicine-18th Edition)

S.No	Stages of Obesity	BMI* (kg/m²)	Risk of Diseases
1.	Underweight	<18.5	
2.	Healthy weight	18.5- 24.9	
3.	Overweight	25.0- 29.9	Increased
4.	Phase 1 obese	30.0-34.9	High
5.	Phase 2 obese	35.0-39.9	Very high
6.	Phase 3 obese	≥40.0	Extremely high

Overweight and obesity are linked to more deaths worldwide than underweight. According to NFHS data from the 2015-2016, in India 18.9% males and 20.7% females are overweight or obese. In Ayurveda, person in whom there is excessive accumulation of *Meda* (adipose tissue) and *Mamsa* leading to flabbiness of Hips, abdomen and breast has been categorized as *Sthaulya*.[3] In Ayurveda, obesity (*Sthoulya*) is described as "*Medoroga*". In the manifestation of any diseases vitiation of certain basic components takes place which are *Doshas, Dushya, Srotas* and *Agni.* In *Sthoulya*, due to *Avarana* (obstruction) of all the *Srotas* (channels) by the *Meda*, there is *Vriddhi* of *Kosthasthit Samana Vayu*, which in turn causes *Ati Sandhukshan* of *Jatharagni*. The increase in *Jatharagni* leads to rapid digestion of consumed food and leaves the person craving for more food. If at all due to some reason the person does not receive more food the increased *Agni* causes *Dhatu Pachana* which may lead to various complications. In this way it becomes a vicious cycle creating excessive improperly formed *Medo Dhatu*, giving various symptoms. Because of such a condition of *Srotorodha*, the other *Dhatus* are not nourished properly causing *Shaithilya* (flabbiness due to excess of water element) of *Dhatus* prior to *Meda Dhatu* and depletion of *Dhatus* next to *Medo Dhatus.*[4] According to *Sushruta, Ama Anna Rasa* is mentioned as root cause of *Sthoulya*. *Rasa* has been considered as a causative factor for *Sthoulya* and *Karshya*. *Ama Rasa* is produced due to *Kapha-vardhakaahara*, *Adhysana, Avyayama, Divaswapana* etc. The *Madhura Bhava Ama Rasa* moves within the body, *Snigdhansha* of this *Anna Rasa* causes *Medovruddhi* which produces excessive stoutness.[5] *Acharya Charaka* has described *Atisthaulya* as *Santarpanajanita Roga*[6] and one among the eight despicable conditions which are designated as *Nindita Purusha*. *Acharya Sushruta* also said that *Madhyama Sharira* is the best but *Ati Sthaulya* and *Ati Krisha* are always affected with some ailments.[7] Increased *Meda* is accountable for several serious consequences like *Ayuhrasa* (decrease of life span), *Javoparodha* (decrease in enthusiasm and activity), *Krichavyavayata* (difficulty in sexual act), *Dourbalya* (decrease of strength), *Dourgandhya* (bad odor), *Swedabadh* (excess perspiration) and *Kshut pipasadhikya* (excessive hunger and thirst), *Mandotsaham* (less activity referring to sedentary lifestyle), *Atisnigdham* (excessive intake of fatty substances) and *Kshuda vriddi* (excessive eating) predispose to Dyslipidemia, Hypertension, Hyperglycemia and documented as risk factors for cardiovascular diseases.[8] Obesity is the major and basic cause of lifestyle disorders like Diabetes mellitus (T2DM), Coronary Heart Disease (CHD), hypertension, infertility, PCOD etc. Obesity (*Sthaulya*) is increasing at an alarming rate in developed industrialized countries which are undergoing rapid nutrition and lifestyle transition. In this regard, this study was carried out to treat *Sthoulya*; taking into the consideration the classical aspects along with the modern interpretations. Though it is a well known fact that *Sthaulya* (Obesity) management runs a long schedule, a sincere effort has been made here to manage *Sthaulya* according to classical line within stipulated time limits. 'Evidence based medicine' is the *Mantra* of the modern era. So revalidation and revitalization is essential through research, in both fundamental and applied aspect of Ayurveda. In the light of above, present study has been selected.

MATERIALS AND METHODS

The research work was planned under the following two headings.

Literary Review: All the concerned Ayurvedic and modern texts related to the disease was studied in details along with modern knowledge of the disease.

Clinical Study: Clinical study was the main component of the present research work. It was carried out only in an open single trial group. Total 30 patients fulfilling the inclusion criteria were selected from OPD/IPD of R.G.G.P.G. Ayurvedic College and Hospital, Paprola (age 18 to 65 years) irrespective of sex, caste and religion. All the patients were screened with respect to BMI, signs and symptoms, waist circumference, hematological, biochemical and urine investigations (M/R) before and after the end of the study. Informed consent was obtained from the patients before starting the intervention.

Diagnostic Criteria

Assessment was done on the basis of BMI, waist circumference, signs and symptom of *Sthaulya* (Obesity). Further diagnosis was made on the basis of the routine haematological, biochemical and urine

(M/R) tests and relevant tests were done if necessary to rule out other diseases.

Inclusion Criteria

a) Patients of either sex, age between 18-65 years.
b) Patients having signs of Obesity.

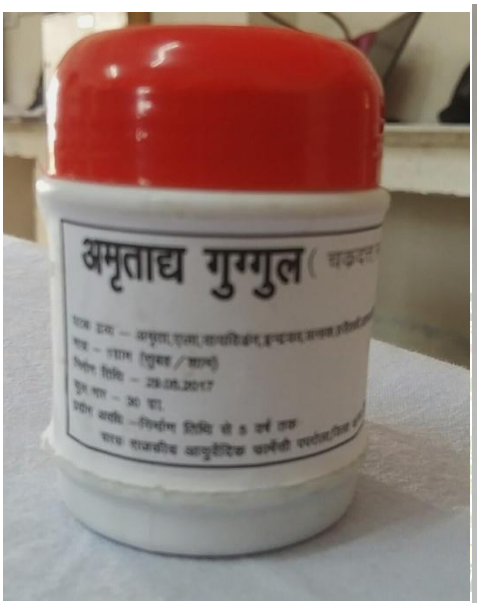
Exclusion Criteria

a) Patient age> 65 yrs and <18 yrs.
b) The obese patients suffering from hypo-thyrodism, cardiovascular disease, Cushing's syndrome, severe hypertension, *Garbhini* (pregnant women), endogenous obesity and from other such disease in which the patients can't do his routine physical activity can be excluded.
c) Very obese (Ati–*Sthaulya*) patients having B.M.I. >45kg/m^2 were also excluded.

Plan of Study

Data collection: Patients designated were completely analyzed by each subjective and objective parameters. A detail history and physical assessment findings were noted. Laboratory investigations were done, to exclude and include within the study.

Treatment: *Amritadya Guggulu* in the dosage of 500mg (2 tablets) twice daily orally with *Madhu* as *Anupana*[9] were given to the selected patients. The raw drugs were taken from the *Charaka* pharmacy Paprola, Joginder nagar pharmacy and Baijnath pharmaceuticals. The drug was prepared in *Charaka* Pharmacy Paprola & was tested at Govt. Drug Testing Lab, Joginder nagar, Dist. Mandi.



Study Duration: Selected drug were given to the patients for the duration of 60 days. 4 follow ups were taken at 15 days interval.

Assessment Criteria

Subjective Criteria

S.No.	Assessment Parameter	Gradation
1.	***Dourgandya***	0- Absence of bad smell. 1- Occasional bad smell in the body removed after bathing. 2- Persistent bad smell limited to close areas difficult to with suppress deodorants. 3- Persistent bad smell felt from long distance is not suppressed by deodorants. 4- Persistent bad smell felt from long distance even intolerable to the patient himself.
2.	***Swasa Kashtata***	0- Dyspnoea after heavy work but relieved after rest. 1- Dyspnoea after moderate work but relieved late & up to tolerance. 2- Dyspnoea after little work but relieved soon & up to tolerance. 3- Dyspnoea after little work but relieved soon & beyond tolerance. 4- Dyspnoea in resting condition.
3.	***Anga Gaurava***	0- No heaviness in body. 1- Feels heaviness in body but it does not hamper routine work. 2- Feels heaviness in body which hampers daily routine work. 3- Feels heaviness in body which hamper movement of the body.

		4- Feels heaviness with flabbiness in all over body which causes distress to the person.
4.	***Ati Kshudha***	0- Feeling of hunger after 6 hours 1- Feeling of hunger between 5 to 6 hours 2- Feeling of hunger 4 hours after meal 3- Irritable desire of hunger 3 to 4 hours after meal 4- Irritable desire of hunger within 3 hours after meal
5.	***Utsaha Hani***	0- No *Alasya* (doing work satisfactory with proper vigour in time 1- Doing work satisfactory with initiation late in time. 2- Doing work unsatisfactory with lot of mental pressure & late in time. 3- Not starting any work on own responsibility, doing little work very slow. 4- Does not have any initiation & not wants to work even after pressure.
6.	***Atipipasa***	0- Normal thirst. 1- Up to 1 lit intake of water in 24 hours. 2- 1to 2 lit intake of water in 24 hours. 3- 2to3 lit intake of water in 24 hours. 4- More than 3 lit. Intake of water in 24 hours.
7.	***Chala Spikha***	0- Absence of *Chalatva.* 1- Little visible movement after fast movement. 2- Little visible movement after moderate movement 3- Movement after mild movement 4- Movement even after changing posture
8.	***Chal Udara***	0- Absence of *Chalatva* 1- Little visible movement after fast movement 2- Little visible movement after moderate movement 3- Movement after mild movement 4- Movement even after changing posture
9.	***Chal Stana***	0- Absence of *Chalatva* 1- Little visible movement after fast movement 2- Little visible movement after moderate movement 3- Movement after mild movement 4- Movement even after changing posture.
10.	***Dourbalya***	0- Can do routine exercise 1- Can do moderate exercise without difficulty 2- Can do only mild exercise 3- Can do mild exercise with very difficulty 4- Cannot be even mild exercise
11.	***Ati Nidra***	0- Normal sleeps 6–8 hrs. / Day 1- Sleep up to 8 hrs. / Day with *Angagaurav* 2- Sleep up to 8 hrs. / Day with *Angagaurav* & *Jrimbha* 3- Sleep up to 10 hrs. / Day with *Tandra* 4- Sleep up to 10 hrs. / Day with *Tandra* and *Klama*
12.	***Snigdha Gatrata***	0- Normal *Snigdhata* 1- Oily complexion of body in summer season 2- Oily complexion of body in dry season 3- Excessive oily complexion of body in dry season can be removed with difficulty 4- Persistent and profuse stickiness all over body
13.	***Sandhi Shoola***	0- No pain 1- Mild pain due to excessive walking 2- Moderate pain due to excessive walking later up to tolerance 3- Severe pain due to mild walking relieved later up to tolerance 4- Pain at the time of resting or sitting also.

Objective Criteria: It was assessed on the basis of BMI, waist circumference and haematological, biochemical and urine investigations before starting the treatment and after completion of treatment in terms of percentage relief and statistical evaluations.

Total effect of Therapy: Steps for calculating overall percentage of improvement of individual patients: All the BT score of every symptoms of a patient were added. All the AT score of every symptoms of that patient were added. Overall percentage of improvement of each patient was calculated by the formula: (Total BT –Total AT)/Total BT x 100.The obtained results were measured according to the grades given below:

- Complete Remission: 100% relief in the signs and symptoms were considered as complete remission.
- Marked Improvement: Above 75% and less than 100% relief in the signs and symptoms were considered as marked improvement.
- Moderate Improvement: Above 50% and less than 75% relief in the signs and symptoms were considered as moderate improvement.
- Mild Improvement: Above 25% and less than 50 % relief in the signs & symptoms.
- Unchanged: Below 25% relief in the signs and symptoms were considered as unchanged.

Presentation of Data: The data collected and compiled from this clinical trial were sorted out and processed further by subjecting to various statistical methods and presented with tabular form in the following sequence.

- General observations viz. age, sex, religion, etc.
- Results of therapy evaluated on the basis of improvement in signs and symptoms, BMI, waist circumference and laboratory investigations.

Statistical Analysis: Observation made about on various parameters was subjected to statistical analysis in terms of Mean, Standard Deviation and Standard Error (SE).

'Paired t-test' was carried out at $p<0.05$, $p<0.01$, $p<0.001$. The obtained results were interpreted as.

- Insignificant $P>0.05$
- Significant $P<0.05$
- Moderately Significant $P<0.01$
- Highly Significant $P<0.001$
- Extremely Significant $P<0.0001$

OBSERVATION AND RESULTS

Under this Present Study

- Total number of patients registered- 30
- Total number of patients completed trial- 28
- Dropout from the study- 02

Table 1: Sign and Symptoms Wise Distribution

S.No.	Signs & Symptoms	No. of Patients	Percentage (%)
1	*Utsaha hani*	24	85.71
2	*Dourgandya*	20	71.42
3	*Ayaseswaskastata*	24	85.71
4	*Anggaurava*	28	100
5	*Atikshudha*	26	92.85
6	*Chal udara*	27	96.42
7	*Chalstana*	13	42.42
8	*Chalsphikha*	22	78.57
9	*Sandishoola*	23	82.14
10	*Atinidra*	22	78.57
11	*Atipipasa*	17	60.71
12	*Daurbalya*	27	96.42
13	*Snigdhagatrata*	6	21.42

Effect of Therapy

All the registered patients were given the trial drug in a single group and assessed on the basis of subjective and objective criteria recorded on 1st and 60th and the effect of the trail drug was seen at the end of the study.

Effect of *Amritadya Guggulu* on the basis of Subjective Criteria

The effect of *Amritadya Guggulu* in 28 patients on various assessment criteria was obtained after statistical analysis of the data obtained and is presented in tabular form below.

Table 2: Effect of *Amritadya Guggulu* on the basis of Subjective Criteria

Symptoms	Mean		Mean Difference	% relief	S.D.	S.E.	't'	P
	B.T	A.T						
Daurgandhya	2.85	0.85	1.95	70.2	0.39	0.08	22.13	<0.001
Swasa kashtata	2.08	0.41	1.66	80.7	0.48	0.09	16.95	<0.001
Anga gandha	2.53	0.71	1.82	71.9	0.47	0.08	20.26	<0.001
Atikshudha	3.30	1.50	1.80	54.5	0.49	0.09	18.75	<0.001
Atipipasa	2.35	0.94	1.41	60.9	0.50	0.12	11.47	<0.001
Chala Sphika	1.52	0.65	0.87	57.2	0.54	0.11	7.60	<0.001
Chala Udara	1.88	0.88	1.00	55.5	0.55	0.10	9.36	<0.001
Chala Stana	1.61	0.92	0.69	42.5	0.48	0.13	5.20	<0.001
Daurbalya	3.70	1.85	1.85	50.0	0.36	0.06	26.58	<0.001
Nidradhikya	1.72	0.40	1.31	76.4	0.47	0.10	12.96	<0.001
Snigdhgatrata	1.04	0.18	0.86	82.9	0.46	0.09	8.66	<0.001
Sandhi shoola	2.08	0.65	1.43	68.8	0.50	0.10	13.57	<0.001
Utsaha hani	1.95	0.41	1.54	79.0	0.50	0.10	14.83	<0.001

Table 3: Effect of *Amritadya Guggulu* on Waist Circumference and BMI

Waist Circumference & BMI (Kg/M^2)	Mean		M.D.	% relief	S.D	S.E	't'	P
	B.T	A.T						
Waist circumference	41.33	39.10	2.23	5.4	0.79	0.15	14.78	<0.001
BMI (Kg/M^2)	33.5	31.8	1.74	5.1	0.90	0.17	10.17	<0.001

Table 4: Effect of *Amritadya Guggulu* on Hematological & Biochemistry Parameters

Parameter	Mean Score		Mean Diff.	% relief	S.D.	S.E.	't'	P
	B.T	A.T						
Hb	12.3	12.9	0.6	4.8	1.19	0.22	2.99	<0.05
TLC	8164.2	7275.0	889.2	10.8	1790.16	338.3	2.6	<0.05
Polymorph	60.0	59.5	0.5	0.8	9.29	1.75	0.2	>0.05
Lymphocyte	31.3	32.5	1.2	3.8	8.3	1.5	0.7	>0.05
Mixed	8.5	7.9	0.6	7.0	3.64	0.6	0.9	>0.05
ESR	19.5	15.5	4.0	20.5	17.3	3.3	0.8	>0.05
FBS	107.5	95.7	11.8	10.9	40.5	7.6	1.5	>0.05
S. Cholesterol	179.5	193.9	14.4	8.0	41.07	7.76	1.85	>0.05
S.Triglyceride	162.5	172.5	10.0	6.1	68.34	12.9	0.77	>0.05
HDL	49.5	47.2	1.67	3.3	13.14	2.48	0.67	>0.05
LDL	94.14	111.67	17.53	18.6	36.45	6.8	2.5	<0.05
VLDL	32.5	34.5	2	6.1	13.6	2.5	0.7	>0.05

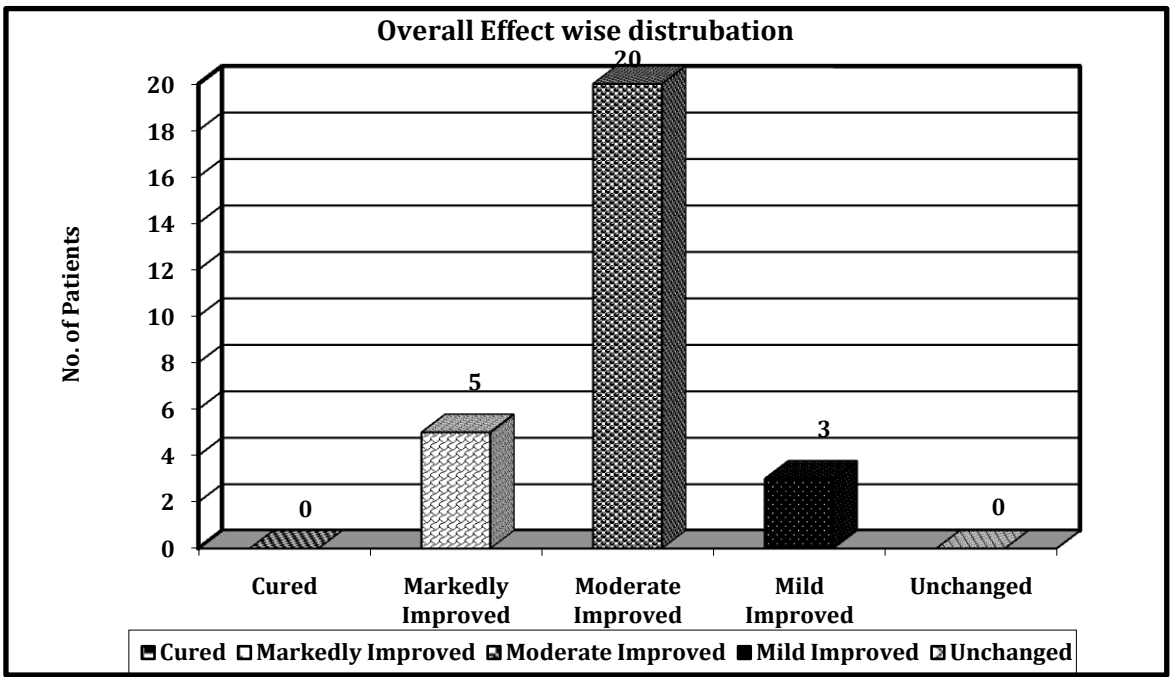


Table 5: Overall Effect wise Distribution

Assessment	No. of patients	Percentage
Cured	00	0.00
Markedly Improved	05	17.86
Moderate Improved	20	71.43
Mild Improved	03	10.71
Unchanged	00	0.00

DISCUSSION

In the disease "*Sthaulya",* patients are having *Tikshnagni* with increased *Jatharagni* where as *Medodhatvagni* is found in *Manda* condition. It is due to *Avarana* of *Vayu* in *Kostha*. So the person desires for more food, which produces excessive *Meda* and the vicious cycle starts. In the *Samprapti* of *Sthaulya*, *Kapha* is the main *Dosha* and *Meda* is the main *Dushya*, while *Agnimandya* takes place at *Medo Dhatvagni* level. So, the drugs which have *Kapha* and *Medo Nashak* property and have efficacy to correct the function of *Medo Dhatvagni*, will give a better result in the management of *Sthaulya*. This cycle is broken (*Samprapti Vighatana*) by *Katu-Rasa* and *Ushna-Virya Pradhana* drugs in *"Amritadya Guggulu"* which decreases *Meda* by its *Lekhana, Shoshana* and *Kapha-nashaka* properties, *Kapha-nashaka* properties due to *Agni* and *Vayu* dominance in them (Su.Su15). So, it is evident that *Katu Rasa* and *Ushna Virya* serves as a *Visesa* for *Medho dhatu, "Amritadya Guggulu"* will decrease *Medo dhatu* in *Sthula* patients.

Discussion on Demographic Profile

Age: The patients were in the range of 18–65 years age. Majority of the patients were reported in the three age groups of 30–41 i.e., 42.85% followed by 42-53 & 54-65 both age group they have 25% and then lastly age group 18-29 have 7.4%

Sex: Out of 28 patients of *Sthaulya*, majority of patients were female i.e., 78.57% and rest were male i.e., 21.42%.

Religion: All patients were Hindu (100%).

Marital Status: 92.8% were recorded as married.

Socio Economic Status: 17 patients (60.71%) belong to middle socio-economic class, 06 patients (21.42%) were of lower class and 5 patients (17.85%) were of higher socio-economic class.

Family History: Out of 28 patients, maximum patients i.e., 16 (57.14%) show positive family history and negative history show 12 (42.85%) patients.

Educational Qualification: In this clinical study, maximum numbers of patients were Graduate (42.85%), followed by primary school (25%), then senior secondary passed (14.28%) and high school having (10.70%) and illiterate were 7.14%.

Occupational Status: Maximum number of patients were having service i.e., 39.28% followed by housewife and farmer both having equally 28.57%, where as 3.57% were students.

Habitat: In the present study maximum no. of patients were from rural area 82.14% followed semi urban area 17.85%.

Dietetic nature and food type: Maximum number of patients were taking mixed diet i.e., 78.57% followed by taking vegetarian diet 21.42%. Maximum number of patients were taking fried food i.e., 96.42% followed by sweet food i.e. ,92.8%, spicy food i.e., 71.42%, rich diet i.e. 53.57%, balanced diet i.e. 35.71%, junk food i.e.17.85% and then by soft drinks i.e.,14.28%.

Appetite: In this clinical study, maximum numbers of patients were found with increased appetite i.e. 78.57%.

Type of Exercise: In this study maximum number of patients i.e., 85.71% patient were doing no exercise, followed by light exercise (such as walking, swimming, games) and moderate exercise i.e. 10.71% and 3.57% respectively.

Addiction: In the current clinical trial, majority i.e., 71.42% of the patients were not having any type of addiction. 8 patients (28.57%) were addicted to tea and coffee both.

Bowel Habits: Maximum patients i.e., 75% were having irregular bowel habit while the rest of i.e., 25% patients were having regular bowel.

Type of Lifestyle: Maximum patients i.e.46.42% were having normal life style followed by 08 patients (28.57%) having sedentary lifestyle and 07 patients (25%) were having active life style.

Sleep: Majority of the patients i.e., 60.71% were having excessive sleep, followed by disturbed sleep 21.43%, and only 5 patients having normal sleep 17.86%.

Built: In present study, maximum of 82.14% of patients had well built *(Samhanana)* and 17.85% average body built, which are the characteristics of *Medoroga*.

Menstrual History: In the observation of menstrual history, 9 patients i.e., 32.14% were having menopausal history followed by 28.57% and 17.85% were having regular and irregular menstrual history respectively.

***Sarira Prakriti*:** Maximum patients i.e. 67.85% patients had *Kapha-Vata Prakriti* followed by 17.85% *Kapha-Pitta* and the rest 14.28% patients had *Vata-Pitta Prakriti*.

***Aharatamaka Nidana*:** Among 28 patients, all patients were consuming sweets, milk, curd and ghee 100%, followed by excessive use of cold diet and rice 96.4%, excessive consumption of heavy food 92.8%, excessive usages of *Kapha* increasing food 85.7%, excessive usage of Jaggery's preparation 78.57%, usage of sugarcane and eggs both are 75.0%, excessive use of phasiolus Mung 71.43%, excessive use of meat, unctuous food, meat are 67.85%, excessive use of fresh grains 60.70%, overeating 46.4%.

***Viharatmaka Nidana*:** *Bhojanottara Nidra* was observed in 85.71% patients, *Avyayama* in 85.71% patients, *Chesta Dwesha* 71.43% *Divaswapa* was observed in 71.43% patients, *Sukhasaiya* in 60.71% patients, *Avyavaya* in 39.28%.

Anya Nidan: In this, *Beejadosha* was observed in 57.14% of the patients.

Discussion on Clinical Features

Purva Rupa: In the *Purva rupa* of *Sthaulya* out of 28 patients 96.43% patients were reported with *Alasyas*, *Angashaithilya* 85.71% and 60.71% patients were reported with *Atinidra*.

***Sroto Dushti*:** *Medovaha* and *Rasavaha Srotodushti* were observed in all the patients

Chief Complaints: In present study, all the patients were having *Bharavriddhi* and *Angagauravata* 100%, *Chal Udara* 96.42%, *Atikshudha* 92.85%, *Ayaseswaskastata* 85.71%, *Daurgandhya* in 71.42%, *Atipipasa* 60.71%, and *Vyavayakastata* were observed in 21.42%.

Associated complaints: In this study patients were suffering from 96.42% *Daurbalyata*, 82.14% *Sandhishool*, 78.57% were reported both *Nidradhikya and Snigdhgatrata* as associated complaints.

B.M.I (Kg/M^2) (Body Mass Index): Study show that maximum 57.14% patients were having B.M.I in the range of 30-35Kg/M^2, 32.14% patients having B.M.I in the range of 35-40Kg/M^2 while 10.71% patients having B.M.I in the range of 25-30Kg/M^2 and none having B.M.I >40Kg/M^2.

Weight (kg): Study show that the maximum no. of patients having weight 70–89kg were 14 (50%), followed by 9 patients having 90-109kg (32.14 %), 50-69kg were 4 (14.28%) and having 110-129kg was 1patient (3.57%).

Height (cm): It was observed that maximum 35.71% patients were having height in the range of 150–159cm, followed by 21.43% in the range of height <150 cm, 160–169cm and >170cm each.

Effect of Therapy on Symptomatology

After the administration of *Amritadya Guggulu*, 68.75% relief in *Sandhishoola*, 82.9% in *Snigdhagatrata*, 76.47% in *Nidradhikya,* 79.0% in *Utsahahan*i, 71.9% relief was observed in *Angagauravata, Daurgandhya* 70.2%, *Atikshudha* 54.5%, *Atipipasa* 60.9%, *Daurbalya* 50.0%, *Chala Udara* 55.5%, *Chala Sphika* 57.23%, *Chala Stana* 42.5%, *Swasa Kastata* 80.76% was seen which all were statistically highly significant (P<0.001). Thus, we may conclude that mostly combination of *Katu-Ras, Laghu, Ruksha* and *Ushna-Virya, Katu-Vipaka Pradhana* drugs in *Amritadya Guggulu* having all the properties which performed the function of *Stroto vibandhanashana* and against *Kapha, Kleda* and *Meda*. These drugs are effective at the level of *Rasa, Meda, Medodhatvagni*, which provided good results in all signs and symptoms.

Effect of therapy on laboratory Investigations

Patients who completed the trial show that in Haemotological profile; Hb, TLC statistically significant results were obtained; but DLC (Polymorph, Lymphocyte, Mixed-Eosinophils, Basophils, Monocytes), ESR of the patients were within the normal limit both before and after the treatment and thus showed statistically insignificant result. In biochemical profile FBS and Lipid profile were also within normal limit both before and after the therapy but the result was statistically insignificant except LDL of the lipid profile which showed statistically significant result after the completion of therapy. No change was recorded in the routine and microscopic examination of urine of patients after completion of the therapy (normal before and after the study).

Effect on Weight and BMI (kg/m^2)

Amritadya Guggulu provided 5.1% reduction in B.M.I (kg/m^2) and 5.4% reduction in waist circumference which shows that effect of medicine was highly significant.

Overall Effect of Therapies

Total 28 patients completed the full course. Out of 28 patients, 20 (71.43%) patients were moderately improved, 05 patients had markedly improvement (17.86%) & 03 patients were mildly improved (10.71%), number patient was completely cured. Thus, in this way over all comparison of all the parameter showed that effect of *Amritadya Guggulu* is better in reduction of Waist Circumference, B.M.I (kg/m^2), Signs and Symptoms.

Probable mode of action of *Amritadya Guggulu* on *Sthoulya*

The mode of action of *Amritadya Guggulu* on *Sthaulya* can be explained as follows:

The disease *Sthaulya* originates due to consumption of *Kapha vriddhikara Ahara - Vihara* and *Anya Nidana.* These factors derange *Jatharagni* causing *Ama Annarasa*, which results in *Medodhatv-agnimandya*. This condition leads to the excessive growth and accumulation of *Medo dhatu*, causing the disease *Sthaulya*. The combined Ayurvedic pharmacological action of *Amritadya Guggulu* on the basis of *Rasa Panchak* is shown in table as follows:[10]

Table 6: *Rasapanchaka* of Drug

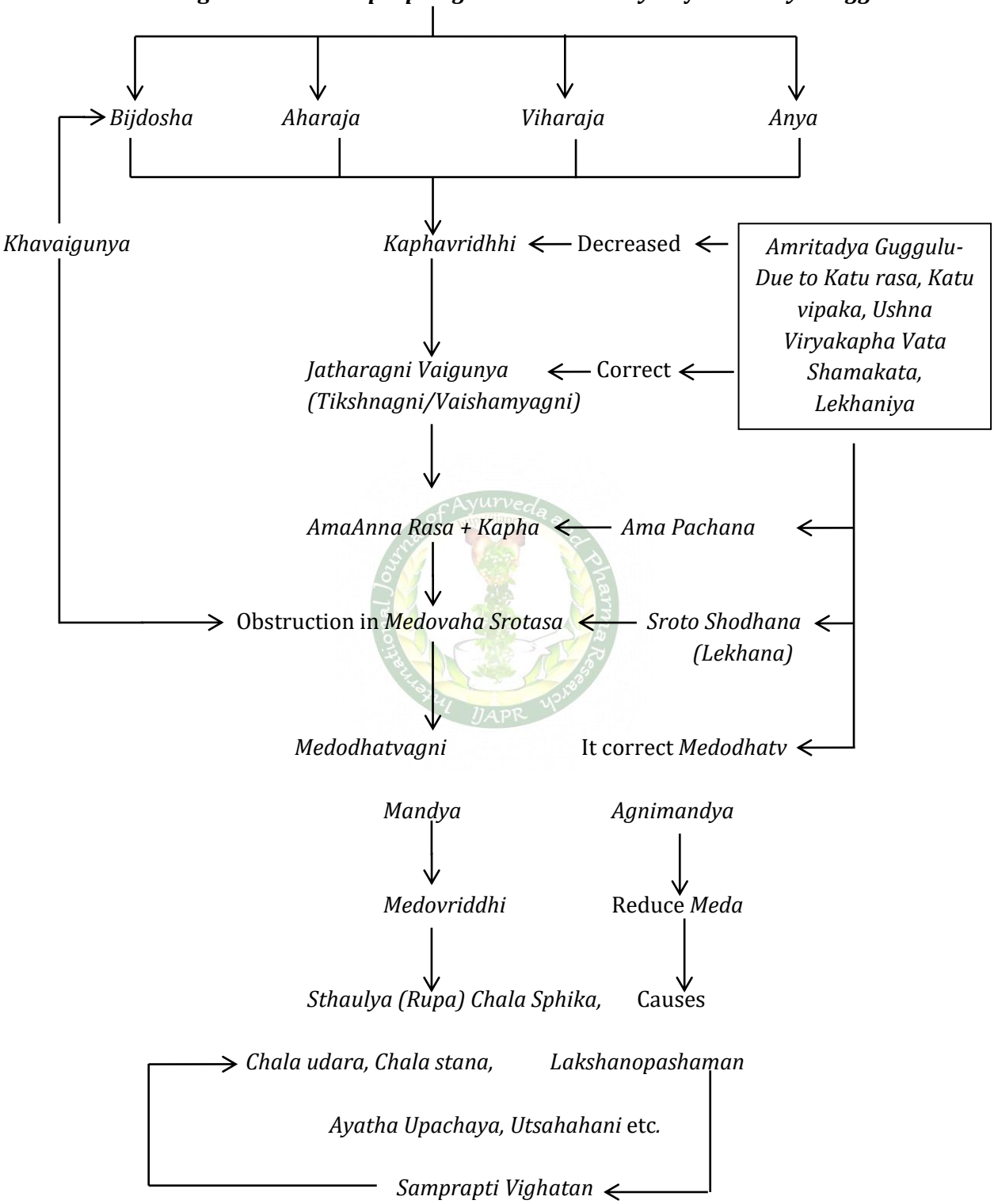
Name of Drug	*Rasa*	*Guna*	*Veerya*	*Vipaka*	*Dosha Karma*
Guduchi	*Tikta, Kashaya*	*Guru, Snigdha*	*Ushna*	*Madhura*	*Tridoshaghana*
Ela	*Katu, Madhura*	*Laghu, Ruksha*	*Sheeta*	*Madhura*	*Tridoshaghana*
Kutaj	*Tikta, Kashaya*	*Laghu, Ruksha*	*Sheeta*	*Madhura*	*Kaphapittashamaka*
Vayavidanga	*Katu, Kashaya*	*Laghu, Ruksha, Tikshna*	*Ushna*	*Katu*	*Kaphavatashamaka*
Vibitaki	*Kashaya*	*Laghu, Ruksha*	*Ushna*	*Madhura*	*Tridoshaghana (Kaphashamaka)*
Haritaki	*Kashaya Pradana Panchrasa*	*Laghu, Ruksha*	*Ushna*	*Madhura*	*Tridoshaghana (Vatashamaka)*
Amlaki	*Amla Pradana Panchrasa*	*Guru, Ruksha, Sheeta*	*Sheeta*	*Madhura*	*Tridoshaghana*
Guggulu	*Katu, Tikta*	*Laghu, Ruksha, Vishada, Suksham, Sara, Sugandhi*	*Ushna*	*Katu*	*Tridoshaghana*

- **At the level of *Dosha:*** *Amritadya Guggulu* encounters *Vata & Kapha Dosha* by virtue of its *Katu-Rasa* dominance & *Ushna-Virya*. *Vatahara* action is also achieved by *Laghu* and *Snigdha* property.
- **At the level of *Dushya:*** *Meda & Kleda* are the chief culprits in *Sthaulya. Katu-Rasa* performs *Medo-Kledopa-Shoshana* action. *Sthairya Guna* of *Madhura Rasa* combats *Sharira Shaithilya*. *Ushna-Virya* also helps in *Kleda* and *Meda Vilayana* action.
- **At the level of *Agni* and *Ama:*** *Katu-Rasa, Ushna-Virya* encounters *Dhatwagni mandya* and potentiates the weakened *Dhatwagni* and help in *Ama pachana* thereby alleviates *Aparipakwa* and *Ama dhatu*.
- ***At the level of Srotas:*** Due to *Katu-Rasa*, all the involved channels are dilated i.e. *"Srotansi Vivrunoti*" action. *Katu-Rasa* and *Ushna-Virya* check over *Medovaha* and *Mamsavaha Srotodushti*. In nut shell in *Amritadya Guggulu* maximum ingredient have *Katu Ras & Laghu, Ruksha* and *Ushna Virya, Katu Vipak, Vata-Kaphashamak, Karshana, Lekhaniya*, *Medorogahara, Amapachana, Dhatu shoshana* properties, which normalize the state of *Agni*. Thus, regulated *Jatharagni*, checked the excessive growth and accumulation of *Medodhatu* and thereby causing *Lakshana Upshamana* of *Sthaulya.*
- An important point is during the clinical study very interesting findings were found. Most of the female

patients who had irregular menstruation earlier were improved to regular menstruation. This may be due to the *Agnimahabhuta Pradhana* (Su. Su.15/16) and *Ushna Virya, Dipana, Pachana* effects of *Amritadya Guggulu* as claimed by our classics.

Charaka Samhita has also described long-term treatment for the disease of *Jirna* and *Atisthulata* which have been considered under *Krichhrasadhya Vyadhi.*

The schematic Diagram of the *Sampraptivighatana* of *Sthaulya* by *Amritadya Guggulu Nidana*



CONCLUSION

At the end of the study, following conclusion can be drawn on the basis of Observations made, results achieved and thorough discussion in the present context and can be summarized as below:

Sthaulya is a predominant metabolic disorder, which is described by *Charaka* in *Ashtaunindita Purusha*. It is a *Meda Dushya* dominant *Vyadhi*, the condition in which *Medo-Dhatvagni Mandya* leads to excessive formation of improper *Meda-Dhatu* resulting in *Sthaulya*. *Nidanas* of *Sthaulya* mentioned in classics are now changing. Increasing stress, faulty dietary habits and decreased awareness regarding exercise are becoming the prominent causative factors for *Sthaulya.* In *Sthaulya,* due to obstruction by *Meda- Vyana Vayu* could not transport nutrient to other *Dhatu,* so *Medadhatu* is increased and *Uttaroutardhatu* will be decreased. Thus remaining in the *Kostha, Vata* causes *Atikshudha*, which increases the severity of the disease and make the *Sthaulya Krriccha Sadhaya.* Mainly *Kapha Prakriti* persons were found more prone to *Sthaulya* (*Ashrayaashrayi Bhava*) so they should be advised proper diet regimens and exercise. In Society, percentage of population suffering from *Sthaulya* is increasing day by day so they should be made aware regarding the disease and its severe complications before it reaches its epidemic level. Obesity occurs more in female than male and specially increases after marriage, light nature of work, use of IUCD, contraceptive pills, after delivery and in menopausal period etc. The positive aspect observed in case of Ayurvedic management is absence of any hazardous side effect, which is really a great benefit to the patients and is of vital importance in view of the global acceptance of Ayurveda. The effect of therapy on overall all symptoms were highly significant; however no considerable changes in haematological and biochemical investigations were obtained in this study except Hb, TLC and LDL which showed significant results. Reason behind this can be given as if the treatment duration would have kept longer, the drug would have shown far better results. Results of this study are encouraging and trial should be conducted on large number of patients and duration of drug should be also increased. Medicine along with specific diet, exercise and *Yoga* will be more effective in the management of *Sthaulya*.

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