A COMPARATIVE CLINICAL STUDY TO EVALUATE THE EFFICACY OF MULAKA YUSHA AND KULATHA YUSHA IN STHAULYA W.S.R TO OBESITY

Dr. Aparna S.[1]*, Dr. Yogeesha Acharya[2] and Dr. Sandesh Kumar Shetty[3]

[1]*PG Scholar, Department of Swasthavritta, SDMCA Udupi.

[2]Associate Professor, Department of Swasthavritta, SDMCA Udupi.

[3]Associate Professor, Department of Swasthavritta, SDMCA Udupi.

*Corresponding Author

Dr. Aparna S.

PG Scholar, Department of
Swasthavritta, SDMCA
Udupi.

ABSTRACT

Background: *Aahara* is one of the prime factors described in *Ayurveda* for healthy living, to promote growth and repairing the tissues. This is supplied through the medium of food containing variety of elements for the proper nourishment of the body. Lifestyle diseases are the outcome of the way we lead our lives. Emerging spectrum of lifestyle diseases is a big health challenge. Obesity is a metabolic disease and a burning issue now-a-days. As the *Dosha* and *Dushya* are *Kapha* and *Medas* respectively, that drug which are *Kapha-Medohara* and corrects *Medo Dhathwagnimandya* should be selected. *Mulaka and Kulatha Yusha* in the literature tackle both *Kapha-Meda Vriddhi* and *Dhatwagnimandya*.

Objectives Of The Study

1. To study the effect of *Mulaka Yusha* in Sthaulya.
2. To compare the effect of both *Yusha* for the management of Obesity & *Sthaulya Lakshana* showing individuals.
3. To study the effect of *Mulaka Yusha* on lipid profile& FBS

Methodology: The current study was carried out on 40 subjects fulfilling diagnostic and inclusion criteria are allocated in to two groups. Group A administered with *Mulaka Yusha* and Group B with *Kulatha Yusha* for 2 months. The assessment was done based on subjective, objective parameters and lab investigations. **Results:** Both group showed significant improvement in subjective and objective parameters within the groups. *Mulaka Yusha* showed better improvement in subjective and *Kulatha Yusha* showed better

improvement in objective parameters. **Conclusion:** In the current study, *Mulaka Yusha* showed better results in improvement of *Sthaulya Lakshana,* body measurements and blood investigations. Thus, this study may be included as regular diet plan in *Sthaulya*/Obesity gives effective results.

KEYWORDS: *Swastha; Sthaulya; Pathya; Yusha; Mulaka.*

INTRODUCTION

'Survival of the fittest' is one phrase we randomly read aloud since ages. Humans always tried of being fit with the demanding changes in the world. In this present era man is leading a fast paced life and he does not spend enough time for a healthy living rather than a better living conditions. He doesn't give importance neither for a healthy lifestyle nor to follow dietetic rules and regulations. Lifestyle diseases are the outcome of the way we lead our lives. Emerging spectrum of lifestyle diseases is a big health challenge. Almost 6 in 10 people are suffering from one or other kind of lifestyle disorders. Obesity is a metabolic disease which makes it a burning issue now a day.

At the end of 20th century, the WHO declared even officially an obesity epidemic. In 2016, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 650 million were obese. 41 million children under the age of 5 were overweight or obese in 2016. As rates of obesity rise, there is a rise of its associated complications also. This has led to fears that obesity related complications such as diabetes, heart disease, dementia and cancer threaten to slow or even reverse the improvements in life expectancy seen over past several decades.[2] India ranks one among the top 10 obese nations of the world and about one million urban Indians are overweight or obese. No wonder that the WHO has concluded that obesity is the major unmet public health problem worldwide.[3]

In Ayurvedic literature, incompatible food intake, taking food before digestion in excess, irregular food time are the causes for different disorders. Meanwhile, regular intake of *Snigdha, Madhura, Picchila Aahra* in the form of *Asya Sukha*, and who has aversion to physical activity and desired of *Swapnasukha* always add on to the disease causing factors.[4] Both these factors are responsible for manifestation of *Santarpanajanya Vikaras* which can be co-related with lifestyle disorders including *Sthaulya.*

A person having excessive growth in *Udaradi* region is termed as *Sthula* and the state of *Sthula* is called *Sthaulya*.[5] *Sthaulya* is caused by over intake of *Guru, Madhura, Snigdha Aahara*, lack of physical exercise, day sleep and *Kapha Meda Vridhikara Ahara* and *Vihara*.[6] In classics, *Beeja Dosha Swabhava*[7] has also described as a specific cause for *Sthaulya*. It is also explained as *Santarpanajanya Vyadhi*.[8] The *Prathyatma Lakshana* of *Sthaulya* are *Chala Sphik,Chala Udara, Chala Sthana,Atimeda Mamsa Vridhi, Kshudra Swasa* and *Ayathopachaya Utsaha*.[9] The complications caused due to *Athisthaulya* are *Prameha Pidaka, Jwara, Bhagandara, Vidradhi*[10] etc. *Sthaulya* is difficult to treat, due to *Vata-Kapha* involvement, involvement of *Medas*, and *Agni* is in *Prabala Avastha* where the management becomes contradictory to each other. *Deepana, Pachana, Vatahara, Kapha Medohara, Teekshna, Ushna, Ruksha Dravyas* are advised in management of *Sthaulya*. As it is one among the *Sleshmaja-Nanatmaja Vyadhis*[11], practise of *Karshana* has to be done in *Sthaulya*.

Obesity is a medical condition in which excess body fat has accumulated to an extent, that it may have a negative effect on health leading to reduced life expectancy and / or increased health problems particularly heart disease, type 2 diabetes, breathing difficulties and osteoarthritis and so on. People are generally considered pre-obese when their body mass index is over 25kg/m^2. This disease can be co-related with that of *Sthaulya*.[12]

Aahara is one of the prime factors described in Ayurveda for healthy living[13] and to promote growth, repairing the tissues etc. This is supplied through the medium of eatables & drinkables containing variety of elements for the proper nourishment of the body. To achieve this, Ayurveda emphasises the importance of proper nutrition through proper food choices, combinations and cooking methods.[14] *Krithanna* is a group of processed food articles which is widely discussed in every literatures of Ayurveda.[15] Food and drinks which are *Medohara* and *Kaphanashana* are the diet which can be prescribed for *Sthaulya*. *Yusha* is a type of diet coming under *Krithanna* Varga[16] explained in Ayurvedic literature suggested for both healthy and diseased.

So many preparations have been mentioned in classics for the treatment of *Medodhatu Vridhi*. But keeping mind on easy availability, compatibility, cost & preparation of drugs *Mulaka Yusha* and *Kulatha Yusha* explained in literature which are *Medohara* and *Laghu Guna*[17] were preferred over others for present study. Here is a try to throw light on effect of *Mulaka Yusha* in *Medohara* that can be taken into practicability.

OBJECTIVES

Primary Objectives

1. To study the effect of *Mulaka Yusha* in *Sthaulya*.

2. To compare the effect of *Mulaka Yusha* and *Kulatha Yusha* for the management of obesity & *Sthaulya Lakshana* showing individuals.

Secondary Objectives

1. To standardize the preparation of *Mulaka Yusha Kalpana*.

2. To study the effect of *Mulaka Yusha* on Lipid Profile.

3. To study the effect of *Mulaka Yusha* in Fasting Blood Sugar

4. To evaluate the possibility of following *Pathya Kalpana* mentioned in classics for obesity and other lifestyle disorders.

METHODOLOGY

SUBJECTS AND METHODS

A total of 65 volunteers were screened for the present study and those who were fulfilling the diagnostic criteria and inclusion criteria were enrolled for the study. A total of 40 individuals were selected irrespective of their age, sex, caste, religion, and socio-economic status after obtaining the written consent. Subjects were allocated to either group, 20 in each by Non Random Sampling Method. For supporting this detailed research proforma was designed with the help of available literary material. The subjects were assessed before and after the intervention and after the follow up period.

Criteria for selection of Volunteers

Diagnostic Criteria

Shwasa on Alpa Cheshta or *Sphik Sthana Udara Lambanam* with BMI more than 25 kg/ m^2.

Inclusion Criteria

1. Subjects showing *Sthaulya Lakshana* and with BMI more than 25 kg/ m^2.

2. Subjects who are willing to give consent for the following treatment.

Exclusion Criteria

1) BMI less than 25 kg/ m^2.

2) *Sthaulya* due to secondary causes example hypothyroidism PCOD etc.

Sample size estimation

The sample size was calculated using a standard formula for sample size estimation, with a power of 80% and level of confidence of 5%. Based on which the number of samples required for each group was 19.26. thus total sample taken was 40 with 20 subjects in each group.

STUDY DESIGN

➢ Study type : Comparative

➢ Allocation: Non-Random Sampling Method

➢ End point classification: Efficacy

➢ Purpose: Intervention

➢ Blinding : Open Blind

➢ Timing: Prospective

➢ Control : *Kulatha Yusha*

➢ No. of groups: Two

Dose fixation

Based on previous study conducted on the control drug *Kulatha Yusha* on *Sthaulya,* where dose given was 200ml, same is considered in the present study with *Mulaka Yusha* also. As *Yusha* is one of the *Aahara Kalpana* this is given along with *Aahara. Aahara Matra* is one of the prime factor in controlling the *Sthaulya*, so in this study, *Yusha* is given twice daily morning and afternoon with half the quantity of usual meal keeping in mind about the concept of *Matravat Aahara* intake.

Intervention

Both the drugs were collected from genuine source and washed. For a person to take 200ml of *Yusha* twice daily 1Kg of drug were boiled in 18 litres of water and was reduced to 8 litres. Added *Lavana, Trikatu* & little amount of ghee for *Ruchya and* was served hot.

Group A: *Mulaka Yusha* 200 ml is administered twice daily morning and afternoon along with half the quantity of usual meal.

Group B: *Kulatha Yusha* 200 ml is administered twice daily morning and afternoon along with half the quantity of usual meal.

Duration of the study: The study period was 60 days. Reviewed on 0th, 30th, 60th day of the study period. **Follow up** done after 30 days after completion of the study.

Methods of Assessment

The assessment of the study was done on the basis of Subjective and Objective parameters. Subjective parameters- This was evaluated in terms of Ayurvedic parameters mentioned in *Sthaulya Samanya Lakshana* explained in literature and previous works done. The following signs and symptoms were graded for assessment.

AYURVEDIC PARAMETERS[18]

Chala Sphik-Udara-Sthana

Absence of *Chalatva* - grade 0

Little visible movement (in the areas) after fast movement – grade 1

Little visible movement (in the areas) after moderate movement – grade 2

Movement in the areas after mild movement – grade 3

Movement in the areas even after changing posture – grade 4

Alasya/ Utsaha Hani

No *Alasya* (doing work satisfactory with proper vigor in time) - grade 0

Doing work with desire with initiation late in time – grade 1

Doing work with desire with lot of mental pressure and late in time – grade 2

Not starting any work with own responsibility, doing little work very slowly – grade 3

Does not have any initiation and not wants to work even after pressure.– grade 4

Kshudra Swasa **(Dyspnoea On Exertion)**

Dyspnoea after heavy work but relieved soon and within the tolerance - grade 0

Dyspnoea after moderate work but relieved later and up to tolerance capacity – grade 1

Dyspnoea after moderate work but relieved later and up to tolerance capacity – grade 2

Dysponea after little work but relieved later and beyond tolerance capacity – grade 3

Dysponea in resting condition– grade 4

Daurbalya **(Weakness)**

Can do routine exercise - grade 0

Can do moderate exercise without difficulty– grade 1

Can do only mild exercise – grade 2

Can do mild exercise with very difficult – grade 3

Cannot do even mild exercise – grade 4

Swedadhikya (**Excessive Sweating**)

Sweating after heavy work and fast movement or in hot season - grade 0

Profuse sweating after moderate work and movement – grade 1

Sweating after little work and movement – grade 2

Profuse sweating after little work and movement – grade 3

Sweating even at rest or in cold season – grade 4

Anga Daurgandhya (**Foul Smell**)

Absence of bad smell - grade 0

Occasional bad smell in the body removed after bathing – grade 1

Persistent bad smell limited to close areas, difficult to suppress with deodorants – grade 2

Persistent bad felt from long distance, not suppressed by deodorants – grade 3

Persistent bad smell felt from long distance even intolerable to the patient himself – grade 4

Snigdhatha (Lustrous Body)

Normal *Snigdhatha* (luster)- grade 0

Oily luster of body in summer season – grade 1

Oily luster of the body in dry season – grade 2

Excessive oily luster of body in dry season which can be removed with difficulty – grade 3

Persistent and profuse stickiness all over the body– grade 4

Anga Gaurava (**Heaviness Of Body**)

No heaviness in the body - grade 0

Feels heaviness in the body but it does not hamper the routine work – grade 1

Feels heaviness in the body which hampers the daily routine work – grade 2

Feels heaviness in the body which hampers movement of the body – grade 3

Feels heaviness with flabbiness in all over body which causes distress to the person - grade 4

Ati Pipasa (**Excessive Thirst**)

Feeling of thirst (7-9 times/24h) and relieved by drinking water - grade 0

Feeling of moderate thirst (>9 times/24h) and relieved by drinking water – grade 1

Feeling of excess thirst (>11-13 times/24h) and not relieved by drinking water – grade 2

Feeling of severe thirst (>13 times/24h) and relieved by drinking water – grade 3

Ati Kshutha (Excessive Hunger)

Starving - grade 1

Ravenous – grade 2

Hungry – grade 3

Mild Hunger – grade 4

Neutral – grade 5

Gatrasada (Fatigue)

No fatigue - grade 0

Little fatigue in doing hard work – grade 1

Moderate fatigue in doing routine work – grade 2

Excessive fatigue in doing routine work – grade 3

Excessive fatigue even in doing little work – grade 4

Nidradhikya (Excessive Sleep)

Sleep up to 6-7 hours per day - grade 0

Sleep upto 8 hours/ day with *Anga Gaurava* – grade 1

Sleep upto 8 hours/ day with *Jrumbha* – grade 2

Sleep upto 10 hours/ day with *Tandra* – grade 3

Sleep more than 10 hours / day with *Tandra* and *Klama* – grade 4

Objective parameters

1. Changes in body weight, BMI, Skin Fold Thickness.
2. Changes in Waist hip ratio, Chest, Waist, Hip, Mid-Arm and Mid-Thigh and Mid-Calf circumferences.
3. Changes in the Lipid profile of the subjects.
4. Changes in Fasting Blood Sugar

OBSERVATIONS

In the present study, majority of the individuals were of age group 20-30years (50%) and were females (72%) and were working(50%) which does sitting type of work(50%). Above 90% of the subjects were non-vegetarians following high carbohydrates and fat enriched food items. Majority of the individuals doesn't have a habit of doing exercise (42.5%).

Maximum number of individuals had an irregular eating habits including excessive food intake, snacks between two meals, skipping the meals. Majority of the individuals belongs to *Pitta Kapha Prakrithi (27.5%)* and showed *Medovaha Sroto dushti Lakshana(57.5%).* in Subjective criteria maximum number of individuals had Anga Gaurava(92.5%) and minimum number of individuals had *Pipasa* (5%).

RESULTS

Both the groups showed improvement in subjective and objective parameters.

Subjective parameters

- Group A showed improvement in *Anga Chalatva, Alasya, Kshudraswasa, Daurbalya, Kshuth, Pipasa, Anga Gaurava, Gatra Sada, Nidradhikya.*
- No improvement was seen -*Swedadhikya, Daurgandhya, Snigdhatha*
  When compared, *Mulaka Yusha* showed better result than *Kulatha Yusha*

Objective parameters

- Both Groups showed highly significant improvement except in parameters: Waist-hip Ratio, Mid-thigh Circumference, Skin Fold Thickness of Subscapular, FBS And VLDL.

When compared, *Kulatha Yusha* group showed better result than *Mulaka Yusha*

Objective parameters within the group is tested with Paired t test- Group A- Mulaka Yusha.

Parameters	Mean	Std. Deviation	Std. Error Mean	Mean difference	%	T	P value
Chest BT	36.77	1.66	.37	-.74	2.02	-4.53	.000
Chest AT	36.03	1.85	.41				
Abdomen/Waist BT	36.54	2.35	.52	-1.54	4.22	-7.75	.000
Abdomen/Waist AT	35.00	2.27	.50				
Hip_BT	39.19	2.45	.55	-1.50	3.84	-5.17	.000
Hip_AT	37.69	2.53	.56				
Weight_ BT	67.48	6.77	1.51	-2.11	3.11	-10.01	.000
Weight_ AT	65.37	7.00	1.56				
BMI_BT	26.86	1.99	.44	-.86	3.21	-9.39	.000
BMI_AT	26.00	2.14	.47				
Skinfold thickness biceps_BT	29.30	5.629	1.258	-1.60	5.46	-6.839	.000
Skinfold thickness biceps_AT	27.70	6.165	1.378				
Skinfold thickness triceps_BT	24.72	9.227	2.063	-1.775	7.17	-12.056	.000

Skinfold thickness triceps_AT	22.95	9.185	2.053				
Skinfold thickness Suprailiac_BT	32.50	4.773	1.067	-1.80	5.538	-5.604	.000
Skinfold thickness Suprailiac_AT	30.45	4.547	1.016				
Serum Cholesterol_BT	182.85	54.755	12.243	-17.15	9.379	-3.832	.001
Serum Cholesterol_AT	181.25	47.025	10.515				
HDL_BT	59.10	13.95	3.121	25.80	43.65	9.389	.000
HDL_AT	64.30	13.09	2.929				
LDL_BT	64.85	32.60	7.291	-17.89	27.586	-5.726	.000
LDL_AT	64.25	23.68	5.295				

Paired t test with-in the group B- Kulatha Yusha.

Parameters	Mean	Std. Deviation	Std. Error Mean	Mean difference	%	T	P value
Chest_BT	37.68	2.435	.544	-.770	2.043	-7.322	.000
Chest_AT	36.91	2.200	.492				
Abdomen/Waist BT	39.14	2.66	.596	-1.365	3.487	-11.618	.000
Abdomen/Waist AT	37.77	2.615	.58				
Hip_BT	40.57	2.702	.604	-1.030	2.538	-9.182	.000
Hip_AT	39.54	2.649	.592				
Weight_ BT	73.11	8.625	1.928	-1.66	2.270	-13.115	.000
Weight_ AT	71.45	8.827	1.974				
BMI_BT	27.87	2.304	.515	-.625	2.24	-7.772	.000
BMI_AT	27.25	2.335	.522				
Skinfold thickness biceps_BT	26.50	5.978	1.336	-2.10	7.924	-11.917	.000
Skinfold thickness biceps_AT	24.40	6.142	1.373				
Skinfold thickness triceps_BT	25.90	5.892	1.317	-1.40	5.40	-5.480	.000
Skinfold thickness triceps_AT	24.50	5.762	1.288				
Skinfold thickness Suprailiac_BT	29.60	5.215	1.166	-1.80	6.081	-5.604	.000
Skinfold thickness Suprailiac_AT	27.80	4.851	1.084				
Serum Cholesterol_BT	186.60	40.90991	9.147	-17.150	9.19	-3.832	.001
Serum Cholesterol_AT	169.45	33.99145	7.600				
HDL_BT	55.75	16.55573	3.701	25.800	46.27	9.389	.000
HDL_AT	81.55	12.17190	2.721				
LDL_BT	76.53	26.17369	5.852	-17.890	23.37	-5.726	.000
LDL_AT	58.64	18.75051	4.192				

Objective parameters are assessed between the groups with Un-paired T test.

Chest circumference	Group	Difference in mean	Unpaired t test			
			S.D	S.E.M	T	P
BT-AT	A	-.745	.73	.16	.128	.899
	B	-.77	.47	.10		
Abdominal/waist						
BT-AT	A	-1.545	.890	.199	-.778	.441
	B	-1.365	.525	.117		
Hip circumference						
BT-AT	A	-1.505	1.300	.290	-1.524	.136
	B	-1.030	.501	.112		
Weight						
BT-AT	A	-2.11	.943	.210	-1.830	.075
	B	-1.66	.566	.126		
BMI						
BT-AT	A	-.86	.412	.092	-1.963	.057
	B	-.62	.359	.080		
Skin Fold Thickness Of Biceps						
BT-AT	A	-1.60	1.046	.233	1.707	.096
	B	-2.10	.707	.176		
Skin Fold Thickness Of Triceps						
BT-AT	A	-1.77	.658	.14	-1.272	.211
	B	-1.40	1.142	.25		
Skin Fold Thickness Of Supra-Iliac						
BT-AT	A	-2.05	1.731	.387	-.497	.622
	B	-1.80	1.436	.321		
Serum Trigyserides						
BT-AT	A	5.50	27.28	6.100	2.496	.017
	B	-17.10	29.929	6.692		
Serum Cholesterol						
BT-AT	A	-1.60	28.68	6.41	1.988	.054
	B	-17.15	20.01	4.47		
HDL						
BT-AT	A	5.20	13.089	2.926	-5.131	.000
	B	25.80	12.288	2.747		
LDL						
BT-AT	A	-.60	33.918	7.584	2.108	.042
	B	-17.89	13.972	3.124		

Subjective Parameters Tested Within The Group By Wilcoxon's Test.

Groups	BT	AT	Intrepretation
Angachaltva **Mean**			
A	1.00	.70	S
B	1.22	1.05	S
Alasya Mean			
A	1.22	.33	HS
B	1.2	.5	S

Kshudra Swasa Mean			
A	1.0	.000	S
B	1.0	1.0	NS
Daurbalya Mean			
A	1.0	.20	S
B	1.12	.437	HS
Swedadhikya Mean			
A	1.2	1.0	NS
B	1.076	1.384	NS
Daurgandhya Mean			
A	1.33	.033	NS
B	1.0	.75	NS
Snigdhatha Mean			
A	1.16	1.16	NS
B	1.44	.44	HS
Anga Gaurava Mean			
A	1.0	1.0	HS
B	1.05	1.05	HS
Pipasa Mean			
A	1.10	1.90	HS
B	.894	1.57	HS
Kshuth Mean			
A	3.9	3.0	HS
B	4.25	3.65	S
Gatrasada Mean			
A	1.25	.00	S
B	1.22	.44	S
Nidradhikya Mean			
A	1.0	.00	S
B	1.25	.625	NS

Subjective Parameters Tested between the group by Man Whitney Test.

Groups	Mean Rank		Z Value	P Value
	A	B		
Angachaltva **Mean**				
BT-AT	18.3	20.83	-.593	.341
Alasya Mean				
BT-AT	17.61	21.20	-1.407	.159
Kshudra Swasa Mean				
BT-AT	2.5	6.0	-2.44	.014
Daurbalya Mean				
BT-AT	12.6	14.06	-.617	.537
Swedadhikya Mean				
BT-AT	7.3	10.35	-1.16	.246
Daurgandhya Mean				
BT-AT	2.5	5.13	-1.83	.006
Snigdhatha Mean				
BT-AT	17.0	11.0	-3.14	.002

Anga Gaurava Mean				
BT-AT	19.0	19.0	.000	1.00
Pipasa Mean				
BT-AT	20.93	19.03	-.681	.496
Kshuth Mean				
BT-AT	19.0	22.0	-1.03	.301
Gatrasada Mean				
BT-AT	7.13	10.67	-1.94	.05
Nidradhikya Mean				
BT-AT	7.5	9.5	-1.46	.144

DISCUSSION

The disease *Sthaulya* is a well-considered disease known from the *Samhitha Kala*. It is considered as one among the *Ashtaunindita Purusha* by Acharya Charaka. *Medoroga* can also be well thought under the heading of *Sthaulya. Nidana* of *Sthaulya* is divided in to 4 categories *Aharatmaka, Viharatmaka, Manasika* and *Anya.* Sthaulya is akin with obesity in terms of causative factors, clinical features and complications even. Diet is one of the prime factors in lifestyle and has an unswerving relation to health. The root cause and the treatment protocol do include food as one of its important factor. All Acharyas explained about it in detail under the heading of *Kritanna Varga*. Because of its *Deepaneeya* and *Paachaneeya* property it was widely explained in various contexts as well as in *Samsarjana Krama.*

Drug Review and its Probable Mode of Action

Acharyas had explained in detail about *Mulaka* in *Shakavarga* or in *Kandashaka Varga*. AcharyaVagbhata have included *BalaMulaka* in *Nitya Sevaneeya Aahara*. Due to its *Katu, Tikta, Kashaya Rasa* and *Ushna Veerya*, it does the *Kapha- Vatashamana*. It also had the *Medohara* property which helps to liquefy the accumulated *Medas* in the body. According to Bhavaprakasha Samhitha, Acharya is explaining about two varieties of *Mulaka*. One is *Laghu Mulaka* and another is *Nepala Mulaka/ Mahat Mulaka. Laghu Mulaka* is of *Katu rasa, Ushna Veerya,* and for digestion *Laghu*. It does the *Pachana Karma* and is *Ruchya* and also *Tridoshahara* in nature.

The basic understanding of mode of action of any drug is based upon the theory of *Guna Siddhanta* (*Rasa, Guna, Veerya, Vipaka and Prabhava*) and *Karma Siddhanta*. Drug acts over the *Samprapthi* of a disease by its *Rasadi Panchaka* and by its *Karma*.   The ability or property of the drug which works on disseminating the *Samprapthi Ghatakas* of a disease is the prime factor to get the desired result.

During the course of manifestation of *Sthaulya* involvement of *Vikrita Meda(Vikrita Vriddhi), Vikrita Kapha(Vikrita Vriddhi), Vataparakopa in Koshta, Medodatwagni Mandya, Teekshnagni* is very common. In the initial phase of *Sthaulya*, *Aama* will be formed at *Koshtagni* and *Dhatwagni* level and in later phase of the *Sthaulya* due to the *Teekshnagni, Sthula* person increases the intake of food causing Medovriddhi again leading the worsening of *Sthaulya*. So the main aim of the treatment modality goes with *Samprathi Vighatana* in 2 different levels of disease manifestation and thereby making the *Dosha, Dhatu* and *Agni* in to normalcy. In the initial stage, the *Deepana* and *Pachana* properties of *Mulaka* works at the level of *Kostagni* thereby correcting *Koshtagni* and preventing the formation of *Amarasa*, that in turn rectifies *Medodhatwagni Mandya* and halts the further progression of *Medo Sanchaya* in different part of the body. As *Mulaka* having *Tikta, Katu* and *Kashaya Rasa,* and *Shoshana, Lekhana, Karshana Karma* it further adds to the function of *Medohara*.

As *Mulaka* is having *Teekshna* and *Ushna Guna*, which resolves the *Srotosanga* in *Koshta* caused by *Medas* in the second phase of *Sthaulya* manifestation. Once the *Srotosanga* gets rectified, movement of *Vata* in *Koshta* become proper. This will further improves the function of *Jataragni* and person will control the intake of *Aahara* leading to proper *Medo Dhatu Upachaya* in *Shareera*. There by,*Rasadi Dhatu* formation also become normal. So, in-short by the action of *Shoshana, Karshana*, and *Lekhana* property of *Mulaka* helps to reduce the accumulation of *Medas* in the body.

As *Sthaulya* is *Kapha- Vatapradhana Vyadhi, Mulaka* mainly acts on *Kapha- Vata* by the virtue of its *Ushna Veerya* and *Kapha-Vatahara* property and acts as *Vatanulomana* by nature. So in total *Deepana, Pachana, Shoshana, Karshana* and *Lekhana* property of *Mulaka* along with its *Katu* and *Tikta Rasa, Ushna Veerya* nullifies the *Sthaulya* manifestation and shows in decreasing in *Samanya* as well as *Pratyatma Lakshana* of *Sthaulya.*

The *Prakshepaka Dravyas* added to *Mulaka Yusha* even though in small quantity helps in *Samprapti Vighatana* of *Sthaulya*. These functions of Mulaka helps in relieving the symptoms like *Kshuda,* etc.

Measurement of circumference, skin fold thickness all considered as the objective criterias. Circumference, Skin fold thickness are mainly depends upon the accumulation of Medas in the body along with presence of *Mamsa* in *Shareera*. The increased body measurements and body weight in *Sthaulya* persons was due to excessive accumulation of *Medas* over *Udaradi*

region and due to increased *Kshuth* which again provokes the person to eat more and there-by making them *Medasvi*. *Mulaka Yusha* shows improvement in decreasing the circumference, skin fold thickness and BMI. As *Mulaka* has the quality of *Shoshaka* and *Lekhana* does the *Vilayana* of *Medas* as well as *Mamsa* in different part of the body. As there is *Vilayana* takes place there is decrease in accumulated *Medas* also. Due to this there is alteration in circumference, skin fold thickness and BMI.

The lipotropic and anti-oxidant activity and with the help all the chemical constituents of *Mulaka* acts upon the serum cholesterol and serum triglycerides thereby increasing the good cholesterol and reducing the bad cholesterol in the body. Hence we considered the *Mulaka Yusha* acts as both primary and secondary prevention in *Sthaulya Vyadhi*. So it can be inferred that *Mulaka Yusha* can be administered on daily basis both for the prevention of the disease and for the management of *Sthaulya.*

CONCLUSION

Sthaulya is one of the *Santarpana Nimitta Vyaddhi* comes under metabolic disorder. *Sthaulya Vyadhi* is akin with obesity in terms of etiological factor, pathophysiology, clinical features and its complications. The main causative factor for *Sthaulya*/ Obesity is nothing but unhealthy food habits and sedentary lifestyle. *Ati Medas, Vikrita Kapha, Teekshnagni, Prabhuta Vata* in *Koshta* are the important factor for the production of *Sthaulya*. Principle of management for *Sthaulya* is decreasing *Atimedas, Kapha, Vikrita Vata & Agni.*

Aahara is one among the *Trayopasthambha* which help in nourishment of the body and there is no other medicine as diet. *Yusha* is one of the *Pathya Kalpana* which is widely explained in literature which possess *Ruchya, Laghu, Deepana, Pachana, Hridya* qualities in general. *Mulaka Yusha* and *Kulatha Yusha* are explained in literature to control *Sthaulya*. *Mulaka* with the quality of *Katu, Tikta Rasa, Laghu Ruksha Teekshna Guna* with *Pachana ,Deepana, Shoshana* and *Lekhana Karma* acts upon the accumulated *Medas* and *Prakupitakapha* in *Sareera* and *Kupithavata* in the *Koshta* will get rectified by removing the *Srotosanga* of *Medas* and correcting the *Koshtagni* and *Dhatwagnimandya*.

By the action of *Teekhna*, *Ushna, Lekhana* and *Shoshana* works at later phase of *Sthaulya* by rectifies the *Srotosanga*, *Teekshangi* and *Prabhuta Vata* in *Koshta*. In the present study, both groups showed highly significant improvement in subjective and objective parameters. Observing the above qualities of *Mulaka Yusha* this can even prescribe in different life style

disorders as *Pathya Kalpana*. *Mulaka Yusha* can be administerd daily to prevent *Sthaulya* and management of *Sthaulya* and hence *Mulaka Yusha* acts as primary prevention as well as secondary prevention in *Sthaulya* / Obesity.

SCOPE OF THE STUDY

♣ *Kulatha Yusha* can be replaced by *Mulaka Yusha* as it causes less body heat compared to *Kulatha*

♣ Further analytical study on *Mulaka Yusha* Nutritive value can be considered in future studies

♣ Similar studies can be taken with larger sample size.

♣ Similar studies can be carried out with other combinations of Yusha.

REFERENCES

1. http//www.japi.org/feb2008/0-99,htm.Cited on 14/04/2021.

2. Mozaffarin, D,Hao, T., Rimm, E., Wille,t W. & Hu, F. Changes in diet and lifestyles & long term weight in men and women. New England Journal of Medicine, 2011; 364(25): 2392-2404.

3. Devi chand.M.A, Atharvaveda. New Delhi: Munshiram Manoharlal Publishers Pvt. Ltd., 1997; 9.

4. Agnivesha. Charaka. Charaka Samhitha. Sutrasthana 23rd chapter. Ayurveda Deepika Commentary. Chakrapanidatta. Acharya Vd. Yadavji Trikamji (edt). Choukhambha Prakashan. Varanasi, 2011; 122: 738.

5. Agnivesha. Charaka Samhith. Sutrasthana 21st chapter. Ayurveda Deepika commentary Chakrapanidatta, Vidyoyhini hindi commetry. Kashinath Shastri. Pandeya G(ed) Chaukhamba Orientalia. Varnasi, 2009; 275: 657.

6. Agnivesha. Charaka Samhith. Sutrasthana 21st chapter. Ayurveda Deepika commentary Chakrapanidatta, Vidyoyhini hindi commetry. Kashinath Shastri. Pandeya G(ed) Chaukhamba Orientalia. Varnasi, 2009; 275: 657.

7. Agnivesha. Charaka Samhitha. Sareerasthana. 2nd chapter. Hindi commentary. Shashirekha H. K, Bargale SushantSukumar(ed). Choukambha Publications. New Delhi, 2009; 402: 879.

8. Agnivesha. Charaka Samhith. Sutrasthana 21st chapter. Ayurveda Deepika commentary Chakrapanidatta, Vidyoyhini hindi commetry. Kashinath Shastri. Pandeya G(ed) Chaukhamba Orientalia. Varnasi, 2009; 278: 657.

9. Vridha Vaghbhata. Ashtanga Sangraha. Sutrasthana 24th chapter. Shashilekha Sanskrit Commentary. Indu. Shivaprasad Sharma(ed). Chaukambha Sanskrit Series Office. Varanasi, 2010; 175: 965.

10. Agnivesha. Charaka. Charaka Samhitha. Sutrasthana 23rd chapter. Ayurveda Deepika Commentary. Chakrapanidatta. Acharya Vd. Yadavji Trikamji (edt). Choukhambha Prakashan. Varanasi, 2011; 122: 738.

11. Agnivesha. Charaka Samhith. Sutrasthana 21st chapter. Ayurveda Deepika commentary Chakrapanidatta, Vidyoyhini hindi commetry. Kashinath Shastri. Pandeya G(ed) Chaukhamba Orientalia. Varnasi, 2009; 275: 657.

12. En.wikipedia.org.   (2019).   Obesity.   [online]   Available   at: https://en.wikipedia.org/wiki/Obesity [Accessed 10 Feb. 2019].

13. Maricha Kashyapa. Vridhajeevaka Tantra. Kashyapa Samhitha. Khilasthana 4th chapter. Teewari P. V Commentary. Teewari. P. V(ed). Chaukambha Vishvabharathi. Varanasi, 2008; 102: 792.

14. Agnivesha. Charaka Samhith. Sutrasthana 28th chapter. Ayurveda Deepika commentary Chakrapanidatta, Vidyoyhini hindi commetry. Kashinath Shastri. Pandeya G(ed) Chaukhamba Orientalia. Varnasi, 2009; 236: 657.

15. Agnivesha. Charaka Samhith. Sutrasthana 28th chapter. Ayurveda Deepika commentary Chakrapanidatta, Vidyoyhini hindi commetry. Kashinath Shastri. Pandeya G(ed) Chaukhamba Orientalia. Varnasi, 2009; 153: 657.

16. Maricha Kashyapa. Vridhajeevaka Tantra. Kashyapa Samhitha. Khilasthana 4th chapter. Teewari P. V Commentary. Teewari. P. V(ed). Chaukambha Vishvabharathi. Varanasi, 2008; 250: 792.

17. Maricha Kashyapa. Vridhajeevaka Tantra. Kashyapa Samhitha. Khilasthana 4th chapter. Teewari P. V Commentary. Teewari. P. V(ed). Chaukambha Vishvabharathi. Varanasi, 2008; 473: 792.

18. Kumari Rajesh, Gupta Satisha, Jain Vivek, Sharma Abhishek.et al; A Comparative Study of Antiobesity Propert of Barley and Oat Flour. Int.J.Ayur Pharma Research, 2015; 3(I): 58-67.