



**A CASE REPORT ON MANAGEMENT OF OBESE CLASS II (STHOULYA)
USING SPECIAL DIET PLAN**

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ABSTRACT

A person is said to be obese, when he/she has a body mass index [BMI (kg/m²)] greater than or equal to 30 and said to be overweight, if BMI is from 25.0-29.9. Obesity is a complex multifactorial disease. Acharya Charaka quoted Sthaulya under the eight types of impediments which are designated as Nindita Purusha in chapter of 21 of Sutra sthana. Acharya Charaka has also included this problem in Santarpanajanya Vyadhi, i.e. disease caused due to over nourishment. Etiological factors (nidana) of sthauilya can be categorised into four. Ahara (food), vihara (activities), beeja dushti (genetic) and mano dosha janyajam (psychological). Diet for obese person must be guru (heavy to handle his hunger due to atyagni and must be atarpana (low calories). In this case we explore the effectiveness of using special diet plan specifically developed for obesity treatment/ sthauilya chikitsa as per Ayurveda. A 27-year-old male patient came to OPD of Swastha vritta and yoga with complaints of increased body weight since child hood.

***Diagnosis** was Obese class II with BMI- 39kg/m². Special diet plan developed by Swastha Vritta Department Sree Narayana Institute of Ayurvedic Studies and Research, Puthur, Kollam was provided as intervention. Patient was admitted for 14 days. On the day of admission dated 18/04/23, patient weight was 125 kg which got reduced to 117 kg at the time of discharge after 14 days. The result showed that there are significant changes in reduction of weight by 9 kg in 14 days. Change in BMI – 39 to 36.5. Change in score of sthauilya assessment questionnaire – 12. Intervention was well tolerable with no adverse events.*

Keywords: Case report, Sthauilya, Ayurveda

INTRODUCTION

A person is said to be obese, when he/she has a body mass index [BMI (kg/m²)] greater than or equal to 30 and said to be overweight, if BMI is from 25.0-29.9 [1]. Obesity is a complex multifactorial disease and is considered as an unprecedented epidemic with increasing prevalence day by day. It is a risk factor for noncommunicable diseases such as diabetes, cardiovascular diseases, and musculoskeletal disorders. It decreases quality of life and life expectancy. The main cause of obesity is long-term energy imbalance between consumed calories and expended calories [2].

Acharya Charaka quoted *Sthaulya* under the eight types of impediments which are designated as *Nindita Purusha* in chapter of 21 of *sutra sthana* [3]. Acharya Charaka has also included this problem in *Santarpanjanya Vyadhi*, i.e. disease caused due to over nourishment. Etiological factors (*nidana*) of *sthaulya* can be categorised into four. *ahara*(food), *vihara* (activities), *beeja dushti* (genetic) and *mano dosha janyajam* (psychological) [4]. Since *medo vaha srotas* is the main *srotas* affected, it includes *medo vaha sroto dushti nidana* also. Pathophysiology behind *sthaulya* is explained as disproportionate increase of fat (*medas*) due to over consumption of *medo dhatyu samya ahara viharas* (similar food and activities that increase fatty tissue). Over consumption leads to *medo dhatwagni*

mandya. So *medo dhatu* formed will be impaired. Movement of *vata (samana vayu)* will be confined to *koshta*(gastro intestinal tract) producing *atyagni* or increase in digestive fire due to obstruction of *srotas* by *accumulated medo dhatu*. *Sthaulya* patient will be having *atyagni* (increased digestive fire) Diet for *sthoala* person must be *guru* (heavy to handle his hunger due to *atyagni* and must be *atarpana* (low calories). In this case we explore the effectiveness of using special diet plan specifically developed for obesity treatment/ *sthaulya chikitsa* as per *Ayurveda*.

Case report [5]

A 27-year-old male patient came to OPD of *Swastha vritta* and yoga with complaints of increased body weight since child hood. Patient has no history of other chronic illness and was not under any medications. He had no history of hypothyroidism, hormonal abnormalities, diabetes mellitus and hypertension. There was no other family history of obesity / overweight.

Physical examination

Relevant physical examination findings include bulky appearance, endomorphic built with a body weight of 125 kg and height 179cms with BMI 39kg/m². Weight was measured on electronic scale without shoes in normal clothing, and height was measured without shoes using a wall stadiometer. BMI was calculated as weight

(kilograms) divided by height (meters) squared. Chest circumference was 109cm and abdominal circumference 116 cm. Relevant *Ayurvedic* examination findings include *prakruthi* of person as *vata kapha*, *saram Madhyama*, *samhananam sthoolam*, *Madhura rasa satmya and yauvana vayas*.

Diagnosis: Obese class II with BMI-39kg/m².

Ayurveda: Sthaulyam with score 16 on *Sthaulya* assessment questionnaire.

Intervention

Intervention type: Special diet plan developed by *Swastha Vritta* Department, *Sree Narayana* Institute of *Ayurvedic* Studies and Research, Puthur, Kollam. Patient was admitted for 14 days.

RESULTS

DAY	Diet
DAY 1 (18-04-2023)	6AM: ash gourd juice (150 ml) + 20 wood apple leaves 8.30 am: oats dosa 2 nos with green gram curry 11 am: carrot juice 1 pm: 1 cup brown rice + 1 cup veg salad + cabbage +butter milk 3.30 pm: 1 guava 8 pm: sprouted green gram
DAY 2 (19-04-2023)	6AM: ash gourd juice (150 ml) + 20 wood apple leaves 8.30 am: oats dosa 2 nos with green gram curry 11 am: carrot juice 1 pm: 1 cup rice + 1 cup veg salad+ cabbage + butter milk 3.30 pm: 1 guava 8 pm: sprouted green gram
DAY 3 (20-04-2023)	6.00 am - banana stem juice - 150 ml, 8.30 am: carrot steam cake 11 am: carrot tomato juice 1 pm: 1 cup brown rice +1 cup sprout salad +1 cup butter milk 3.30 pm: banana blossom vada: 2 nos 8 pm: 2 chappathi + vegetable soup
DAY 4 (21-04-2023)	6.00 am - banana blossom juice - 150 ml, 8.30 am: carrot steam cake 11 am: carrot tomato juice 1 pm: 1 cup brown rice +1 cup sprout salad +1 cup butter milk 3.30 pm : banana blossom vada : 2 nos () 8 pm: 2 chappathi + vegetable soup
DAY 5 (22-04-2023)	6.00 am - banana stem juice - 150 ml, 8.30 am: carrot steam cake 11 am: carrot tomato juice 1 pm: 1 cup brown rice + 1 cup sprout salad +1 cup butter milk 3.30 pm: banana blossom vada: 2 nos () 8 pm: 2 chappathi + vegetable soup
DAY 6 (23-04-2023)	6.00 am – 120g ash gourd juice +20 punarnava leaves 8.30 am: oats dosa + red amaranth curry 11 am: beetroot cucumber juice 1 pm: 1 cup brown rice +mixed boiled veg +1 cup butter milk 3.30 pm: gooseberry turmeric juice 8 pm: pumpkin soup +1 apple
DAY 7 (24-04-2023)	6.00 am – 120g ash gourd +20 punarnava leaves 8.30 am: oats dosa + red amaranth curry 11 am: beetroot cucumber juice 1 pm: 1 cup brown rice + avial +1 cup butter milk 3.30 pm: nellikka (goose berry) manjalpodi (turmeric) juice 8 pm: pumpkin soup +1 apple
DAY 8 (25-04-2023)	6.00 am – 120g ash guard + 20 punarnava leaves 8.30 am: oats dosa + cheera curry 11 am: beetroot cucumber juice 1 pm: 1 cup brown rice + mixed boiled veg +1 cup butter milk

	3.30 pm : gooseberry turmeric juice 8 pm: pumpkin soup +1 apple
DAY 9 (26-04-2023)	6.00 am – banana stem juice 8.30 am: rava + carrot upma 11 am: carrot tomato juice 1 pm: 1 cup brown rice +1 cup snake gourd thoran +1 cup butter milk 3.30 pm: buttermilk + trikatu (three pungents) + amalaki juice 8 pm: chappathi + boiled vegetable salad
DAY 10 (27-04-2023)	6.00 am – banana stem juice 8.30 am: rava + carrot upma 11 am: carrot tomato juice 1 pm: 1 cup brown rice +1 cup snake gourd thoran +1 cup butter milk 3.30 pm: buttermilk + trikatu + amalaki juice 8 pm: chappathi + boiled vegetable salad
DAY 11 (28-04-2023)	6.00 am – banana stem juice 8.30 am: rava + carrot upma 11 am: carrot tomato juice 1 pm: 1 cup brown rice +1 cup snake gourd thoran +1 cup butter milk 3.30 pm: buttermilk +t rikatu + amalaki juice 8 pm: chappathi +boiled vegetable salad
DAY 12 (29-04-2023)	6.00 am – 120 g ash gourd + 20 wood apple 8.30 am: wheat upma 11 am: fruit salad with guava apple and orange 1 pm: 1 cup brown rice +beet root thoran + 1 cup butter milk 3.30 pm: amalaki + turmeric +butter milk 8 pm : 2 apple
Day 13 30-04-2023	6.00 am – 120 g ash gourd +20 wood apple 8.30 am: wheat upma 11 am: fruit salad with guava apple and orange 1 pm: 1 cup brown rice + beet root thoran +1 cup butter milk 3.30 pm: amalaki + turmeric + butter milk 8 pm: 2 apple
Day 14 01-05-2023	6.00 am – 120 g ash gourd +20 wood apple 8.30 am: wheat upma 11 am: fruit salad with guava, apple and orange 1 pm: 1 cup brown rice + beet root thoran + 1 cup butter milk 3.30 pm: amalaki + turmeric +butter milk 8 pm :2 apple

Intervention outcome

On the day of admission dated 18/04/23, patient weight was 125 kg which got reduced to 117 kg at the time of discharge after 14 days. The result showed that there are significant changes in reduction of weight by 9 kg in 14 days. Change in BMI – 39 to 36.5. Change in score of *sthaulya* assessment questionnaire – 12. Intervention was well tolerable with no adverse events.

DISCUSSION

Rationale of the diet plan

Department of *Swasthavitta*, *Sreenarayana Institute of Ayurvedic Studies and Research*

has formulated an obesity diet chart for the treatment of obese patients. For a *sthaulya* person, diet must be guru (heavy) to handle his hunger due to *atyagni* and must be *atarpana* (low calories). *Pathya aharas* of diseases mentioned as *santarpana janya rogas* are carefully studied and ingredients are carefully crafted to be both nutritious and tasty. The diet was prepared with two main intentions. The total calories a day should be less than 1000 kilo calories and post meal satiety should be attained. Calorie restriction was set to be the primary driver of weight loss. The prepared diet plan was

low carbohydrate, low fat diet with 1000 kilo calories a day. 6 meal timings per day was planned. 6 meals a day is found to reduce overall calorie intake with hunger in check to avoid over eating. To increase the

post meal satiety, fibre rich fruits and vegetables were added owing to the fact that insoluble and soluble fibres increase post meal satiety.

Calorie value

Table 1: Day 1,2 diet caloric value

Day 1,2				Total Calories -621 Cal					
	Breakfast	Snacks	Brunch	Lunch			Snacks	Dinner	
	6:00 AM	8:30 AM	11:00 AM	1:00 PM			3:30 PM	8:00 PM	
Name	Kumbalanga Juice	Oats Dosa (2)	Carrot Juice	Rice	Vegetable Salad	Buttermilk	Cabbage Thoran	Guava	Molapichaya Payar
Quantity	100ml	150g	250ml	Cup /124	1bowl/100g	100ml	100g	1 Fruit/70g	80g
Calories	7 Cal	262 Cal	14 Cal	120 Cal	36 Cal	18cal	92 Cal	48 Cal	24 Cal
Protein	0.3g	5.7g	0.3g	2.6g	0.9g	0.9g	5.5g	1.8g	2.4g
Carbohydrates	1.4g	32.5g	3.2g	26.7g	6.5g	0.9g	19.6g	10.0g	4.8g
Fat	0.1g	12.1g	0.1g	0.4g	0.9g	1.2g	12.8g	0.7g	0.2g
Fiber	2g	3g	3g	0.5g	2.1g	0.0g	77.4g	3.8g	1.4g
Calcium	14.5mg	88.48mg	18.85mg	6.16mg	21.3mg	47.10mg	113.68mg	12.60mg	10.40mg

Table 2: Day 3,4,5 diet caloric value

Day 3,4,5				Total Calories-843 Cal					
	Breakfast	Snacks	Brunch	Lunch			Snacks	Dinner	
	6:00 AM	8:30 AM	11:00 AM	1:00 PM			3:30 PM	8:00 PM	
Name	Vazhappandi Juice	Carrot Puttu	Carrot + Tomato Juice	Sprout Salad	Brown Rice	Buttermilk	Vazhakombu Vada	Vegetable Soup	Chappati
Quantity	100ml	150g	250ml	113g	1 Cup/206g	100ml	2nos/80g	250g	2nos/70g
Calories	20 Cal	265 Cal	19 Cal	40 Cal	181cal	18cal	188cal	86 Cal	170 Cal
Protein	0.1g	4g	0.7g	2.8g	3.9g	0.9g	4.7g	2.5g	6.1g
Carbohydrates	4.6g	46.6g	3.7g	8.6g	37.9g	0.9g	15.2g	14.5g	34.7g
Fat	0.1g	6.4g	0.2g	0.3g	1.4g	1.2g	12.2g	2.4g	0.9g
Fiber	0.9g	4g	1.7g	2.3g	1.7g	0.0g	4.8g	3.6g	5.7g
Calcium	10.3mg	16.29mg	16.62 Mg	20.09mg	15.99mg	47.10mg	37.32mg	72..56g	29.60mg

Table 3: Day 6,7,8 diet caloric value

		Day 6,7,8					Total Calories: 895 Cal			
	Break Fast	Snacks		Brunch	Lunch		Snacks	Dinner		
	06.00 AM	8:30 AM		11:00 AM	1:00 PM		3:30 PM	8:00 PM		
Name	Ash Gourd Juice	Rava Dosa (2)	Cheera	Beetroot + Cucumber Juice	Brown Rice	Aviyal	Butter Milk	Nellika + Manjal Podi Juice	Apple(1)	Vegetable Soup
Quantity	100ml	164g	1 Cup/150g	100ml	1 Cup/ 206g	100g	100ml	100 ML	149g	250g
Calories	7cal	262 Cal	129cal	36 Cal	181cal	76 Cal	18cal	2 Cal	18 Cal	86 Cal
Protein	0.3g	4.7g	5.9g	0.7g	3.9g	1.3g	0.9g	0.0g	0.3g	2.5g
Carbohydrates	1.4g	38.2g	16.8g	7.9g	37.9g	9g	0.9g	0.6g	20g	14.5g
Fat	0.1g	9.8g	4.4g	0.2g	1.4g	3.9g	1.2g	0.09g	0.8g	2.4g
Fiber	2g	29g	4g	3.2g	1.7g	2.6g	0.0g	0.3g	4.8g	3.6g
Calcium	14.5mg	34.27mg	53.11mg	22.9mg	15.99mg	31.4mg	47.10mg	4.90g	20.39mg	72..56mg

Table 4: Day 9,10,11 diet caloric value

		Day 9,10,11			Total Calories : 742 Cal			
	Breakfast	Snacks	Brunch	Lunch		Snacks	Dinner	
	6:00 AM	8:30 AM	11:00 AM	1:00 PM		3:30 PM	8:00 PM	
Name	Kumbalanga Juice	Oats Dosa	Carrot Juice	Brown Rice	Padavallanga Thoran	Buttermilk	Buttermilk+ Trikatu	Soup
Quantity	100ml	2nos,150g	250ml	1 Cup/206g	166g	100ml	100ml	250g
Calories	7 Cal	262 Cal	14 Cal	181cal	156 Cal	18cal	18cal	86 Cal
Protein	0.3g	5.7g	0.3g	3.9g	1.8g	0.9g	0.9g	2.5g
Carbohydrates	1.4g	32.5g	3.2g	37.9g	8.2g	0.9g	0.9g	14.5g
Fat	0..1g	12.1g	0.1g	1.4g	13.0g	1.2g	1.2g	2.4g
Fiber	2g	3g	3g	1.7g	4.5g	0.0g	0.0g	3.6g
Calcium	14.5mg	88.48mg	18.85mg	15.99mg	52.13mg	47.10mg	47.10mg	72..56g

Table 5: Day 12,13,14 diet caloric value

Day 12, 13, 14				Total Calories : 895 Cal				
	Breakfast	Snacks	Brunch	Lunch			Snacks	Dinner
	6:00 AM	8:30 AM	11:00 AM	1:00 PM			3:30 PM	8:00 PM
Name	Kumbalanga Juice	Godambu Upma	Fruit Salad	Brown Rice	Beetroot Thoran	Green Salad	Nellika Juice + Buttermilk	Apple (2)
Quantity	100ml	1 Bowl /130g	193g	1 Cup/206g	100g	1 Bowl/233g	100ml	364g
Calories	7 Cal	130 Cal	84 Cal	181cal	90 Cal	172 Cal	16 Cal	215 Cal
Protein	0.3g	3.9g	1.3g	3.9g	1.9g	2.4g	0.8g	0.7g
Carbohydrates	1.4g	14.4g	19.5g	37.9g	9.3g	10.5g	1g	48.8g
Fat	0.1g	4.2g	0.6g	1.4g	5.2g	13.9g	1g	1.8g
Fiber	2g	3.4g	5g	1.7g	3.6g	4.3g	0.1g	11.7g
Calcium	14.5mg	25.12mg	2.02mg	15.99mg	27.5mg	64.44mg	42.2mg	49.8mg

Morning juice

Diet starts with morning juice with carefully chosen ingredients rich in anti-oxidants and vitamins to provide benefits of maximum absorption in empty stomach.

Ingredients

Banana pith stem juice is chosen because it contains potassium, vitamin B6, vitamin C, Magnesium, Manganese, carbohydrates other minerals and micro nutrients. It is very useful to regulate acidic levels of human body and is diuretic and plays a vital role in gut health. As it's a rich source of vitamin B6 and iron, it increases the haemoglobin level and reduces LDL. Another ingredient is Aegle marmelos leaves. It is astringent in taste and is digestive and stomachic. It has anti-inflammatory properties and lipolytic

effects. Esculetin present in it reduces body weight and total triglycerides. Kumbalanga /ash guard juice is rich in dietary fibre and has lipid lowering properties. Punarnava leaves is rich in calcium and vitamin c. It prevents fluid retention and effectively manages obesity.

Ingredients of breakfast

Breakfast is composed of Oats, wheat, semolina and carrot. Rolled oats is rich in B complex vitamins and contain healthy fats and is rich in fibre. Semolina is rich in protein and has very less cholesterol. It retains muscle mass and improves metabolism. Whole wheat provides good source of fibre proteins and complex carbohydrates.

Mid-morning juice ingredients

Carrot tomato juice: has less sugar and free calories and is rich in vitamins A, B, C and K. There are research evidences for carrot juice lowering glucose and fat levels. 9 ounce of Tomato juice taken by Chinese woman significantly reduced their fat and cholesterol level in two months. Tomato juice helps to stimulate the production of carnitine an amino acid that helps fat burning.

Beetroot cucumber juice: Evidence suggests that this juice prolongs gastric emptying thereby giving prolonged satiety.

Meal ingredients

Brown rice: fibre rich whole grain, doesn't cause the spike in sugar levels, makes person feel fuller.

Butter milk: lactic acid present in butter milk helps to break down the nutrients from the body effectively. So, it reduces the stored fat and is a probiotic hence improves gastro intestinal health.

Snake guard: It is a vegetable low in calories having high fibre and water content and is good in diabetes.

Cabbage: It is also very low in calories, rich in water, keeps the body full and prevents hunger pangs.

Sprout salad: It is low in calorie and high in protein.

Evening snacks

Nellikka (goose berry): high in vitamin C, increases metabolism and burns fat in the body

Guava: this fruit contains only 37 calories/ fruit and 12 % is fibre content. It is filling snack.

Vazhakoombu (banana blossom): it is high in fibre and contains very few carbohydrates and proteins.

Dinner

Apple and Pumpkin are rich in fibre and have fewer calories and is very important in digestive health.

Outcome of the diet

The patient was not at all hungry or tired even after doing exercise. Instead, Patient felt light and fresh. Diet provided enough calories to do work, supplied adequate micro and macro nutrients and cut down excess calories without making trouble to the patient. Diet was well tolerable and there were no reports of any events like indigestion, head ache, fatigue or hunger in between meal timings.

Strengths and limitations in approach to this case

Patient was admitted in IP so the compliance of the diet can be well assessed. As limitation, vyayama (exercise) was not given.

CONCLUSION

This case report shows that the prepared diet chart can be effectively advised for patients to reduce body weight of obese persons.

Informed consent: patient was informed that the case will be used for publication by

maintaining all privacies regarding the identity of him.

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