

Observational Case Study on the Effectiveness of the Herbal Decoction Varanadi Kashaya in Managing Obesity of an Individual with Metabolic Disorders

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Abstract: Obesity is increasing globally generating serious non-communicable diseases. The antiobesity drugs in the market don't have any impact on adipocytes; the root cause of obesity, but give rise to many side effects. Several clinical studies have shown the potential of Varanadi Kashaya (VK) mentioned in Ayurveda classic Ashtanga Hrudaya in suppressing adipogenesis and lipid accumulation favoring anti-obesity action without any side effects. Yet, the efficacy of VK in managing obesity in individuals with metabolic disorders has not been evaluated in detail. As the constituents of VK has hypocholesterolemic, anti-diabetic and antioxidant characteristics it can address metabolic disorders as well. This study aims to determine the efficacy of VK in an obese individual with metabolic disorders. Materials and Methods: VK was given for 30 days to an obese person with diabetes and hyperlipidemia and evaluated the changes in anthropometry, Ayurveda parameters and laboratory investigations. Results: High-risk apple shape body shifted into a ratio between apple and pear threshold; a moderate risk to health problems by reducing weight/hip ratio (0.95 to 0.84), LDL (112.6 mg/dl to 106.2 mg/dl), total cholesterol (180 mg/dl to 171 mg/dl) and Non-HDL levels (132 mg/dl to 129 mg/dl) Conclusion: VK has the potency to address both subcutaneous and visceral fat; reducing obesity and controlling obesity-related metabolic disorders.

Keywords: Ayurveda, Obesity, Pharmacological Attributes, Varanadi Kashaya

1. Introduction

Obesity is a major health issue in today's society leading to serious risk factors like cardiovascular diseases, hypertension, type 2 diabetes and dyslipidemia. As per Ayurveda, Obesity is described as *Sthaulya* or *Medoroga* under the caption of *Santharpanajanya Roga* [1]; a disease caused by adverse dietary habits and activities. According to the text *Madhawa Nidana*, a person is said to be very obese when his buttocks, abdomen and breasts begin to show movements during activity as they are the depots of accumulation of fat. His body build and enthusiasm are disproportionate to his age [2].

The absence of physical activity, sleeping during the day and intake of food which increases *Kapha* makes the end product of digestion become (abnormally) sweet. This in turn causes an increase of *Medha* (fat) obstructing the nutrient channels. The remaining tissues deprive of getting nutrition. So only fat accumulates in large quantities in the body; making the person incapable of all activities [2]. The person will gradually develop difficulty in breathing even on slight exertion, thirst, delusions, sleep, sudden catching of breath, exhaustion, excessive hunger, bad smell of the body and poor physical and sexual capacity. Elevation of fat inside the abdomen obstructs the channels of *Vata*. *Vata* acts rapidly and increases the digestive fire (Agni) making voracious hunger in the person and a craving for a large

quantity of food. *Vata*, *Agni* and increased fat together imbalances all three *Doshas*. This gives rise to many severe complications and even loss of life [2].

Preclinical and clinical findings have revealed that an anti-obese activity should reduce lipid droplets than modulating calorie intake [3]. But FDA approved anti-obesity drugs available in the market cause weight reduction as a result of the detrimental effects of drugs. They are either inhibitors of lipid digestion or drugs used to treat other diseases [4]. Moreover, these drugs also have other side effects like cardiovascular risk, teratogenicity risk and liver failure [5]. And also these drugs have no direct effect on pre-adipocytes or adipocytes, which play a major role in developing obesity [4]. Synthetic pharmaceuticals are relatively more expensive and despite their strong pharmacological action; produce numerous undesirable side effects [6]. But the herbal preparations are natural elements. They eliminate the root cause, restore balance and prevent recurrences. They have polyherbalism; a combination of multiple ingredients in a single prescription. They have the phenomenon of pharmacodynamic and pharmacokinetic synergism of plants of varying potency. These when combined confer better therapeutic effect even with a lower dose to achieve desirable pharmacological action [6].

Varanadigana Kashaya also known as *Varanadi Kashaya* mentioned in the Ayurvedic textbook *Ashtanga Hrudaya* is one of the best-known Ayurvedic decoctions used for the treatment of obesity [7]. It consists of Stem bark of Varuna (Lunuwarana)-*Crataeva nurvala*, roots of Sairyaka (Kaha Katukaradu)-*Barleria prionitis*, roots of Sahachara (Nil Katukaradu)-*Barleria strigosa*, tuber of Shatavari (Hathawariya) -*Asperagus recemosus*, roots of purified Chitraka (Ela nitul)-*Plumbago zeylanica*, roots of Morata (Murva)-*Marsdenia tenacissima*, roots of Bilva (Beli)-*Aegle marmelos*, roots of Vishanika (Wel Masbedda)-*Gymnema sylvestre*, roots of Brihati (Thittha Tibbatu)-*Solanum indicum*, roots of Kantakari (Katuwelbatu)-*Solanum xanthocarpum*, stem bark of Karanja (Magul Karanda)-*Pongamia pinnata*, roots of Pootikaranja (Godakirilla)-*Holoptelia integrifolia*, roots of Agnimantha (Heen Midi)-*Premna integrifolia*, fruit rind of Pathya (Aralu)-*Terminalia chebula*, stem bark of Bahalapallawa (Murunga)-*Moringa oleifera*, roots of Darbha (Kusathana)-*Desmostachya bipinnata* and roots of Rujakara (Idi)-*Phoenix paludosa*.

Studies have proven that *Varanadi Kashaya* inhibits adipogenesis and lipid accumulation by down-regulating genes involved in adipogenesis and lipid metabolism. As preadipocytes and adipocytes play an important role in obesity, this will be a good candidate for the treatment of obesity and obesity-related lifestyle [4]. From the analysis of phytochemistry and pharmacological actions, most of the components contain in *Varanadi Kashaya* hold the properties of hypocholesterolemic [15, 17], anti-oxidant [8, 9, 10, 12, 14, 15, 17], free radical scavenging, anti-inflammatory [8, 15, 12, 14, 16, 17], hepatoprotective [8, 9, 13, 16], diuretic [8, 9, 11], anti-diabetic [8, 9, 12, 13, 14, 15, 17], anti-hypertensive [8], cardio-protective and immunomodulation.

Ayurvedic properties of the drugs contain *Tiktha Rasa* (bitter taste), *Lagu Guna* (physical property - light), *Ushna Virya* (hot potency) and *Katu Vipaka* (metabolic property-pungent), *Kashaya Rasa* (astringent taste), *Ruksha Guna* (physical property-dry), *Kaphavatahara* (reduce Kapha and Vata Dosha). As *Sthaulya* (Obesity) is a *Kapha* predominant *Vyadhi* (disease), the *Kaphavatahara* property corrects fat metabolism and normalizes the end product and breaks down the *Samprapthi* of *Sthaulya* [18].

Many clinical trials done on *Varanadi Kashaya* on anti-obesity have excluded patients with metabolic disorders like Diabetes Mellitus (DM) and Hypertension (HTN). But this Observational case study is carried out to prove the effectiveness of *Varanadi Kashaya* in managing Athisthaulya (obesity) of an individual with metabolic disorders.

2. Case Study

A 55-year-old female presented to the National Ayurveda Teaching Hospital, Borella, with the chief complaint of weight gain over 25 years with excessive sweating, hunger and thirst for 10 years and 3 years of heaviness in the body, body aches and exhaustion.

2.1. History of Present Illness

According to the patient, she was overweight since childhood but had noticed sustained weight gain in the past 25 years. Excessive sweating, hunger and thirst had gradually occurred in the past ten years after menopause. She has had body aches and continuous headaches for the past 5 years. She has consulted an allopathic doctor and was diagnosed with diabetes and high blood pressure, and the prescribed medication continues to date. She was asked to reduce weight but has not taken any measurements. The heaviness of the body, body aches and exhaustion have gradually increased over the last 3 years but has not received any medical support.

2.2. Past Medical and Surgical History

She was a known DM and HTN patient for 5 years and was in control with allopathic medication. She had a surgical history of LSCS twice, 27 and 21 years back.

2.3. Menstrual and Obstetric History

No history of abortions or premature births. Menopausal at the age of 45. There was no menopausal bleeding. Has had an irregular menstrual cycle with severe pain and heavy bleeding.

2.4. Treatment History

Glimepiride Tablets USP 2mg: 1 tab nocte. Losartan Potassium and Hydrochlorothiazide Tablets USP 50mg+12.5mg: 1 tab nocte. No allergic drug history.

2.5. Family History

Maternal and paternal history of DM and HTN and her

father has died of a stroke at 78 years. Her 27 years old eldest daughter is also obese since childhood.

2.6. Social, Occupational and Personal History

An accountant by occupation. Sedentary work all through the week and the work was stressful. Middle-class stable income with positive family support. No overcrowding and well sanitization in house and surrounding.

Her diet consisted of high amount of starchy, salty, oily, spicy and sweet food. She had a good 6 hours of continuous sleep. No any exercises. Sedentary lifestyle. Was addicted to tea with sugar 3 times a day.

2.7. General Physical Examination of the Patient

General physical and psyche appearance was good. Built obese. No any swelling, discolorations or lymphadenopathies were noticed. Striae were observed in the abdomen and arms.

Her pulse rate was 68/min, BP 120/80mmHg, temperature 36.3C and respiratory rate was 17/min.

2.8. Systemic Examination

Gastro-Intestinal System- Distended abdomen, umbilicus cleft deeper than normal, striae gravidarum present, soft in touch and no organomegaly noticed.

Cardio Vascular System- S1 S2 present, no murmur heard.

Respiratory System- B/L, symmetrical, normal vesicular breathing, no added sounds.

Nervous System- Oriented and conscious, no any defects.

Musculo Skeletal System- lower abdomen hanging and loose skin in arms.

2.9. Ashtavidha Pariksha

Nadi – 68/min, regular

Mutra – 5-6 times/day, 1 time/night; niraama

Mala – 1 time/day; niraama

Jihva - niraama

Shabdha - prakrita

Sparsha - snigdha

Drik – prakrita

Akriti – sthula

Table 1. Anthropometric measurements of the patient.

Anthropometry	Measurement	Normal range		
Body weight	71.9 kg	-		
		BMI	Weight Status	
		Below 18.5	Underweight	
		18.5 – 24.9	Normal or healthy weight	
BMI	30.1	25.0 – 29.9	Overweight	
		30 – 34.9	Obese class 1	
		35 – 39.9	Obese class 2	
		>40	Obese class 3	
Waist	99cm	-		
Hip	104cm	-		
		Health risk	Women	Men
		Low	0.8 or lower	0.95 or lower
Waist/hip ratio	0.95	Moderate	0.81-0.85	0.96-1.0
		High	0.86 or higher	1.0 or higher
Chest	102cm	-		
Mid arm	33cm	-		
Mid-thigh	50cm	-		
Mid-calf	33cm	-		
Abdomen	104cm	-		

Table 2. Patient's scale for obesity as per Ayurveda (0-5).

Movement of buttocks	0
Movement of abdomen	0
Movement of breasts	0
Breathlessness	0
Foul smell	0
More hunger	3
More thirst	3

Table 3. Laboratory Investigations of the patient before the treatment.

Investigation	Result	Normal range
FBS	112mg/dl	75-126 mg/dl Normal < 5.6%
HbA1c	6.9%	High risk of diabetes 5.7 – 6.4% Diabetes > 6.4
SGOT	26.7 IU/L	< 35 IU/L
SGPT	35.7 IU/L	< 40 IU/L
Lipid profile:		

Investigation	Result	Normal range
Total cholesterol	180mg/dl	140-200 mg/dl
Triglycerides	97mg/dl	10-190 mg/dl
HDL	48mg/dl	30-85 mg/dl
LDL	112.6mg/dl	75-159 mg/dl
Cholesterol Non-HDL	132mg/dl	55-189 mg/dl
VLDL	19.4 mg/dl	10-41 mg/dl
CHOL/HDL	3.7mg/dl	2-5 mg/dl
LDL/HDL	2.34mg/dl	0.01-3.3

2.10. Diagnosis

The patient was diagnosed as Athisthaulya (Obesity) with Madhumeha (DM) and Vyanabala vaishmya (HTN).

3. Treatment Schedule

Varanadi Kashaya was prepared as a Mana Kashaya. 1 Kalan and 8 Madata of each ingredient were taken and added 16 parts of water, boiled and reduced to 2 parts. The final 2 parts were divided into equal 3 parts and given in the morning, evening and next day morning before meals continuously for 30 days.

She was asked to continue her allopathic treatments for DM and HTN.

No any changes were done to the diet. No any specific exercises were given. follow- up was done on the 31st day.

4. Observations and Results

During this case study Patient lost 1kg of body weight. 9cm reduction of waist circumference reduced the waist/hip ratio significantly, shifting the high-risk apple shape body into a ratio between apple and pear threshold which is of moderate risk to health problems. Her BMI shifted from obese class I to overweight (as per the International Classification of adult underweight, overweight and obesity by WHO). And she also reduced 2cm from the mid-arm circumference, 3cm from the mid-thigh circumference and 5cm of the abdominal measurements.

Significant reduction of total cholesterol (180mg/dl to 106.2mg/dl), LDL (112.6mg/dl to 106.2mg/dl), Cholesterol Non-HDL (132mg/dl to 129mg/dl) was observed. Her fasting blood sugar levels (112mg/dl), SGOT (26.7 IU/L), SGPT (35.7 IU/L), HbA1c (6.9%) levels were constant all throughout.

The symptoms of heaviness in the body, body aches, exhaustion, excessive hunger, thirst and sweating were also markedly reduced after the 30 days of treatment.

Table 4. Anthropometry changes.

Observation	Before treatment	After treatment
Body weight	71.9 kg	70.9kg
BMI	30.1	29.7
Waist	99cm	90cm
Waist/hip ratio	0.95	0.84
Mid arm	33cm	31cm
Mid-thigh	50cm	47cm
Abdomen	104cm	99cm

Table 5. Changes in lipid profile.

Lipid	Before treatment	After treatment
Total cholesterol	180mg/dl	171mg/dl
LDL	112.6mg/dl	106.2mg/dl
Cholesterol Non-HDL	132mg/dl	129mg/dl

Table 6. Changes in the Ayurveda scale (0-5).

Observation	Before treatment	After treatment
More hunger	3	0
More thirst	3	0
More debility	3	0
Excess sweat	3	0

Table 7. Changes in signs and symptoms.

Signs and symptoms	Before treatment	After treatment
Heaviness of body	+++	-
Body aches	++	-
Exhaustion	+++	-
Excessive hunger	++	-
Excessive thirst	+++	+
Excessive sweating	++++	+

5. Discussion

By evaluating Ayurvedic properties, it's clearly seen that 99% of the drugs contain *Tiktha Rasa, Lagu Guna, Ushna Virya* and *Katu Vipaka*. 95% of the drugs contain *Kashaya Rasa* and *Ruksha Guna*. 99% constituents of *Varanadi Kashaya* is *Kaphavatahara*. As *Sthaulya* is a *Kapha* predominant *Vyadhi*, the *Kaphavatahara* property corrects fat metabolism and normalizes the end product and breaks down the *Samprapthi* of *Sthaulya*. *Amapacahana, Anulomana, Grahi* actions of those drugs correct the imbalance of *Doshas* and maintain a balanced state of *Doshas* [18]. *Katu, Thiktha Rasa, Lagu, Ruksha Guna, Ushna Virya* and *Katu Vipaka* has *Deepana, Pachana* [18] properties. In *Sthaulya*, both *Jataragni* and *Dhatvagnis* are affected. *Ama* formation occurs. By *Deepana-pachana* action; *Agni* is corrected. Proper *Dhatu Pachana* takes place and reduces the chances of excess *meda* which in turn prevents the chances of *Sthaulya*. *Tikta, Kashaya Rasa, Ruksha Guna, and Ushna Vipaka* have *Chedana and Bhedana* [18] properties that break down the excess *Medas*. This helps in increasing Basal Metabolic Rate and relieves the symptoms and effectively manages *Sthaulya*.

During this case study patient lost 1kg of body weight. Waist circumference was reduced by 9cm which significantly reduced the waist/hip ratio, shifting the high-risk apple shape body into a ratio between apple and pear threshold which is of moderate risk to health problems. BMI shifted from obese

class I to overweight (as per the International Classification of adult underweight, overweight and obesity by WHO) as Chedana, Lekhana and Bhedana properties of VK and Tikta Kashaya Rasa, Ruksha Guna, Ushna Vipaka and Kaphavatahara Karma breaks the excess meda and corrects the fat metabolism.

Significant reduction of total cholesterol (180mg/dl – 106.2mg/dl), LDL (112.6mg/dl – 106.2mg/dl), Cholesterol Non-HDL (132mg/dl -129mg/dl) was observed as Amapachana, Anulomana, Grahi actions corrects and maintain the imbalance of Dosha, Kaphavatahara karma breaks the excess meda and Deepana, Pachana corrects Agni and proper Dhatu Pachana takes place.

Her fasting blood sugar levels were constant throughout as Deepana, Pachana with Katu, Thikta Rasa, Lagu, Ruksha Guna, Ushna Virya and Katu Vipaka corrects Agni and proper Dhatu Pachana takes place.

The symptoms of heaviness in the body, body aches, exhaustion, excessive hunger, thirst and sweating were also markedly reduced after the treatment as Deepana, Pachana corrects Agni, Kaphavatahara karma breaks the excess Meda and Amapachana, Anulomana, Grahi actions correct and maintain the imbalance of Dosha.

These justify the results obtained from this observational case study.

6. Conclusion

Most of the research done for *Varanadi Kashaya* on anti-obesity has excluded patients with metabolic disorders. But this case study apparently suggests that *Varanadi Kashaya* is significantly effective on obese patients with metabolic disorders like DM and HTN. Even without interfering with diet and workouts, *Varanadi Kashaya* can address both subcutaneous and visceral fat. Hence, opens up the possibilities of controlling obesity and obesity-related complications.

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