

# Role of *Udvartana* in Prevention and Management of Metabolic Syndrome - A Review

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## ABSTRACT

The global burden of Metabolic Syndrome has drastically increased over the past three decades. More than a billion people worldwide are now suffering from Metabolic Syndrome and in order to stop the disease's spread, not only medication but life style modifications are necessary. MetS is a cluster of central obesity, high plasma glucose levels, increased blood pressure and increased low density lipoproteins (LDL) and low HDL. In Ayurveda, this condition can be correlated with *medo dushti vikar* along with *prameha* and *sthaulya*. Various acharyas have mentioned the elaborated Chikitsa for these ailments which include *Shodhana* and *Shaman Chikitsa*. However, if we are looking for a simpler and more successful way to cure or prevent the condition, Udvartana Karma seems to be a better alternative which is often performed with *rukshan dravyas*. It is said to have *Kaphahara* and *Medohara* properties i.e., it promotes fat reduction, tissue integrity, and skin health. Clinical research indicates that udvartana has several catabolic effects on body fat. According to one study, udvartana causes a considerable drop in physical parameters such as body weight, BMI, waist circumference, hip circumference, waist hip ratio, and skin fold thickness and also it exhibits adequate viability in terms of lipid levels. All of these actions of udvartana can collaboratively avoid the development of metabolic syndrome and further aid to lower the possibilities of having correlated morbidities such as fatal heart conditions.

**KEYWORDS:** Metabolic Syndrome, *Udvartan*, Obesity,

## INTRODUCTION

Metabolic Syndrome which is a cluster of central obesity, high plasma glucose levels, increased blood pressure and increased low density lipoproteins (LDL) and low HDL is the consequence of poor life style choices along with some genetic and physiological factors. The global burden of Metabolic Syndrome has drastically increased over the past three decades. More than a billion people worldwide are now suffering from Metabolic Syndrome. So, appropriate action towards its prevention and early management is required to address its global

impact. From maintaining a healthy life style through *ritucharya* and *dincharya* to providing a better management through *shodhan* and *shaman chikitsa*, a comprehensive approach to deal with such life style diseases is widely explained in Ayurvedic literature. Under *Shodhan Chikitsa*, a medical procedure called *Udvartan* is mentioned which is a dry massage done with *ruksha dravyas*. Its diurnal practice helps in reducing body fat along with significant decrease in serum lipid (LDL) and increase in HDL.<sup>1</sup> As excessive body weight and dyslipidaemic

condition plays a crucial role in the development of Metabolic Syndrome. by managing these adverse conditions, *Udvartan* can serve as a potential measure for the prevention and treatment of this disorder.

## **MATERIALS AND METHODS**

Various books and manuscripts have been considered for the ancient literature regarding the subject and many published research work have also been taken into consideration.

## **REVIEW OF LITERATURE**

### **AN OVERVIEW OF METABOLIC SYNDROME**

Metabolic imbalance in a person is considered as a Syndrome, if he has 3 or more of the following conditions –<sup>2</sup>

- waist circumference over 40 inches (men) or 35 inches (women)
- blood pressure over 130/85 mmHg
- fasting triglyceride (TG) level over 150 mg/dl,
- fasting high-density lipoprotein (HDL) cholesterol level less than 40 mg/dl (men) or 50 mg/dl (women)
- fasting blood sugar over 100 mg/dl.

All these conditions can together increase the risk for developing atherosclerotic Changes, cardiovascular disorders, insulin resistance, diabetes mellitus along with some serious vascular and neurological changes.

### **Etiology:**

Etiology for MetS is excessive weight, Physical inactivity along with unhealthy diet and genetic predisposition. The main factor which leads to the development of this syndrome is adipose tissue deposition especially visceral fat or upper body fat as it releases proinflammatory cytokines such as adiponectin, plasminogen activity inhibitor, leptin and resistin all of them together leads to tissue dysfunction and insulin resistance which further causes more complications.

### **Pathology:**

Pathological changes leading to metabolic syndrome are as follows-

An enlarged adipose tissue mass releases copious amounts of free fatty acids (FFAs). FFAs cause the liver to produce more triglycerides and glucose as well as secrete more very low-density lipoproteins (VLDLs). Reduces in high-density lipoprotein (HDL) cholesterol and a rise in low-density lipoprotein (LDL) particle number (no.) are examples of related lipid/lipoprotein disorders. FFAs also lessen muscle's sensitivity to insulin by preventing insulin from facilitating the absorption of glucose. Reduced glucose partitioning to glycogen and increased lipid buildup in triglycerides (TG) are two associated abnormalities. Hyperinsulinemia is the outcome of increased pancreatic insulin production due to elevated levels of circulating glucose and, to a lesser extent, free fatty acids. Elevated levels of FFAs in the bloodstream and hyperinsulinemia may both lead to increased sympathetic nervous system (SNS) activity and improved salt reabsorption, which in turn may exacerbate hypertension. The superimposed proinflammatory state contributes to the insulin resistance that comes from consuming too much FFAs. Adipocytes and monocyte-derived macrophages secrete more interleukin 6 (IL-6) and tumour necrosis factor a (TNF-a), which leads to increased insulin resistance and lipolysis of adipose tissue triglyceride reserves to circulation free fatty acids. In addition, the generation of VLDL by the liver, hypertension, and insulin resistance in muscle are all exacerbated by IL-6 and other cytokines. In addition to increasing adipocyte production of plasminogen activator inhibitor 1 (PAI-1) and hepatic production of fibrinogen, cytokines and FFAs also induce a prothrombotic condition. C-reactive protein (CRP) is produced by the liver in response to increased circulating cytokine levels. The metabolic syndrome is also linked to decreased adiponectin production, which is

a cytokine that reduces inflammation and increases insulin sensitivity. (Harrison

principle of internal medicine )<sup>3</sup>. Fig1 (Pathophysiology)

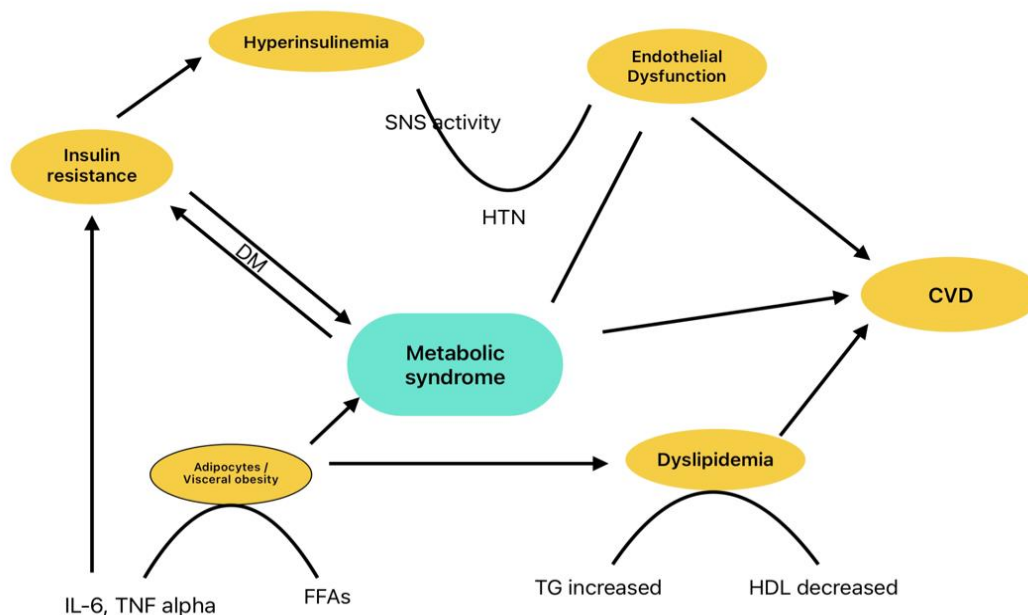


Fig. 1

### UDVARTANA:

It is a therapeutic massage done with oil for nervous disorders as well as a dry form of massage with powders for *Kapha* disorders such as rheumatoid arthritis. It is done by performing firm pressure with a consistent flow of upward strokes and this therapy is also used for dissolving excess fat.

Venimadhav Shastri Joshi in Ayurveda Mahakosha has explained the meaning of 'Udvartana' as *Gatramardnam* (dravyam kriya cha) and *Twakgharshnam*<sup>3</sup>

The acharyas treat many illnesses with *udavartana*, Acharya Charaka states that it has multiple benefits and is used to treat a variety of ailments, including body odour, heaviness, sleepiness, itching, anorexia, and excessive perspiration. According to Acharya Sushruta, it helps to get rid of the body of fats and *Vikruta kapha* as well as pacifies *Vata*. Likewise, *Udavartana's*

advantages have also been cited by other acharyas.

In obesity, it is indicated to be done with the help of dry powders and is named as *udgharshana*. Fine dry powder *Haritaki* (*Terminalia chebula*) and *Ishtika churna* (Brick Powder). As it causes *Pravilapanam*(dissolution or liquification) and *Vimplapanam*(mutilation).<sup>4</sup>

### TYPES (a/c to Acharya Sushruta)

**a. Udgarsana:** the application of dry powders made from different herbs to the body without the use of oils or other liquids.

**b. Utsadana:** This practice is comparable to *Udgarsana*; the sole distinction is that it involves the use of oil or any other type of fluid.

Benefits of *udvartana* described in different *Samhitas* are as follows: -<sup>3</sup>

Sr. No.	Benefits	Charaka	Sushruta	Vagbhata	Yogaratanakar
1	<i>Dourgandya hara</i>	+	-	-	-
2	<i>Gourava hara</i>	+	-	-	-
3	<i>Tandra hara</i>	+	-	-	-
4	<i>Kandu hara</i>	+	-	-	-
5	<i>Mala hara</i>	+	-	-	-
6	<i>Aruchi hara</i>	+	-	-	-
7	<i>Vata hara</i>	-	+	-	-
8	<i>Kapha vilayana</i>	-	+	-	-
9	<i>Meda vilayana</i>	-	+	+	-
10	<i>Anga sthirikarana</i>	-	+	+	-
11	<i>Twak prasadakara</i>	-	+	+	+
12	<i>Kapha hara</i>	-	-	+	+
13	<i>Meda hara</i>	-	-	-	+
14	<i>Shukrada</i>	-	-	-	+
15	<i>Balya</i>	-	-	-	+
16	<i>Kanthi</i>	-	-	-	+
17	<i>Twak mrudutwa</i>	-	-	-	+

As per the principle mentioned in ancient scriptures *Udvartana* can be used in various ailments which are related to lifestyle disorder.

3. For heaviness and stiffness in body.
4. In cases of extreme fatigue and lethargy.
5. When the patient is well enough to handle a dry and exhausting type of care.

**Indication of *Ruksha udvartana*:**

1. In cases of severe *Kapha* morbidity.
2. For obese patients and hypercholesterolemia.

**Indications of Various drugs for *udvartan* in conditions similar to *Metabolic Syndrome*.<sup>6</sup>**

Drugs	Indications
<i>Kulattha Churna</i>	to reduce excessive perspiration and accumulated subcutaneous fat
<i>Shailayadi churna</i>	Obesity
<i>Triphla churna</i>	In Obesity, Skin diseases
<i>Nalpamaradi churna</i>	DM associated with itching
<i>Kolkulattaadi churna</i>	Obese patients, Neurological ailments

Similarly, there are several drugs mentioned for *Udgarshana*.

**For *Siramukh Vivitaktavum* (vasodilation)**

<i>Mrittika churna</i>	To reduce oiliness in skin
wood powder, <i>Reetha</i> powder	for <i>Udgarshana</i>
<i>Ishtika churna</i>	for <i>Udgarshana, Kandu, Kotha</i>

**Duration of *Udvartana*:**

*Udvartana* is performed for atleast 30 and 45 minutes. Three to five minutes are spent massaging each body component in its

proper position and the length of treatment varies from 7 to 14 days according to the type and severity of the illness.

## DISCUSSION

### Probable mode of action of Udvartan on MetS

As explained in our literature, *Kapha-meda vilayana* is a feature of the *Udvartana* process. The effect of *medavilayana* happens if any *Ruksha* medication is utilized as *udvartana dravya*. To improve this *medavilayana* feature, the following should be chosen: *katutikta rasatmak, ushnaviryatmak laghu ruksha, tikshna gunatmak udvartana dravya*. On the basis of *Samanya Vishesh Siddhant*, we can elucidate the *medovilayana* process. Acc to this *Siddhant*, *Udvartna dravya* acts as *Gunavishesha* as well as *Kriyavishesha* whereas *Udvartna* procedure acts as *Kriyavishesha*.<sup>7</sup>

Therefore, it can be said that it functions as a *strotogami* and *medogami* because of the *dravya's ushna, tikshna, and laghu* properties and method. *Kleda* gets absorbed because of *ruksha guna* of *dravya* and *ruksha udvartana*. Hence, it clears the *avarodh* i.e., obstruction due to increased *kapha* and *meda dhatu*.

### Effect of udavartan on different attributes of Metabolic Syndrome.

- **Obesity**- Excessive accumulation of fat leads to obstruction of channels and researches have concluded that, the thicker the subcutaneous fat layer, the smaller is the blood flow per unit weight and to mobilize these fat cells, greater circulation is required which can be enhanced locally by *udvartan* through constant rubbing of *ruksha* and *kaphameda vilayan dravyas*. This also leads to beta-3 receptors stimulation in the adipose tissue of subcutaneous fat, causing the triglyceride in the subcutaneous tissue to break down into fatty acids. As per research conducted for the management of obesity vis-à-vis *Sthaulya*, significant improvement was seen in almost all the parameters like BMI and Weight reduction and hyperlipidaemia because it eliminates doshas from the body and also performs

*Samprapti Vighatana* for *Sthaulya* at cellular level.<sup>8</sup>

- **Insulin Resistance**- as it is described earlier, insulin resistance is directly associated with obesity and adipose tissue deposition. So, Practicing *Udvartan* on a regular basis can assist to reduce insulin resistance.
- **Dyslipidaemia**- in Metabolic Syndrome, low HDL levels and high Triglycerides levels are observed and Clinical research shows that *Udvartana* can help reduce both tissue fat and serum lipids.<sup>1</sup> It has demonstrated a significant reduction in serum lipids as well as an increase in HDL cholesterol and it has been seen that *Udvartan* can enhance the lipolytic enzyme activity.
- **Hypertension**- in case of Metabolic Syndrome, HTN develop as a result of the loss of insulin's vasodilatory action and increased vasoconstriction due to more FFA formation. But during the *udvartana* procedure, the medication comes into contact with the skin and due to constant rubbing dilation of the cutaneous vessels occur and the local temperature rises. This increases circulation in the internal organs as well and helps in transporting the free fatty acids to the liver.<sup>9</sup> This way it helps in countering the effect of free fatty acids.

## CONCLUSION

Metabolic Syndrome has become an epidemic over a period of time. Since, it has a complex medical diagnosis and following only the conventional treatment methods seems to be less beneficial for stopping the spread of this syndrome, we must look forward for contemporary solutions to provide aid to the diseased along with educating the people for a healthy living and diet structure. Effect of *udvartan* is not only restricted to reduce fat but if performed in an adequate manner regularly, it has a noteworthy potential to lessen the complications caused due to overweight like diabetes and cardiovascular problems by enhancing the blood circulation and



breaking down the excess fat deposition as well as lowering down the serum lipid levels. Its daily practice can provide incredible effects specially for the prevention of development of the syndrome by ruling out the root cause of it i.e., obesity.

#### **Declaration by Authors**

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