

RESEARCH ARTICLE

Concept of metabolic syndrome in Ayurveda

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ABSTRACT

Metabolic syndrome is a multi-factorial disease, frequently associated with a cluster of pathologies including obesity, hypertriglyceridemia, impaired glucose tolerance, and insulin resistance, collectively referred to as the metabolic syndrome (formerly known as syndrome X and insulin resistance syndrome). It is present in 25–50% of the United States population. There has been a heightened awareness of the metabolic syndrome and a subsequent increase in clinical attention directed towards prevention, due to its strong association with premature morbidity and mortality. In particular, these risk factors predispose the individual to greater risk for developing cardiovascular disease and Type 2 diabetes. According to Ayurved it can be understood under umbrella of *medavahasrotodusti*. Initial condition of metabolic syndrome can be compared with *medavaha srotodusti laxana*. The fully developed metabolic syndrome without complications can be compared with *Apathyanimitaja prameha* and complicated stage of metabolic syndrome can be compared with *Updrava* of *Avaran*. Ayurved treatment of metabolic syndrome depends on its various stages. The lifestyle can be modified according to do's (*Pathya*) and don't's (*Apathya*) mentioned in above cited Ayurvedic conditions.

Ayurveda, so that further prevention and curative measures of metabolic syndrome can be achieved.

INTRODUCTION

Metabolic syndrome, sometimes known by other names like insulin resistance syndrome, syndrome X, is a clustering of at least three of the five following medical conditions, i.e abdominal (central) obesity, elevated blood pressure, elevated fasting plasma glucose, high serum triglycerides and low high-density lipoprotein (HDL) levels.

Metabolic syndrome is associated with the risk of developing cardiovascular disease and type 2 diabetes.^{[1][2]} Some studies have shown the prevalence in the USA to be an estimated 34% of the adult population,^[3] and the prevalence increases with age.

The syndrome is thought to be caused by an underlying disorder of energy utilization and storage. The cause of the syndrome is an area of ongoing medical research.

There is not any effective and safe treatment for metabolic syndrome in Modern medical science. World is looking with hope for prevention and treatment of metabolic syndrome from Ayurveda. For prevention and treatment of metabolic syndrome, it is must to understand metabolic syndrome with Ayurved perceptive. So this research article has been prepared to enlighten the concept of metabolic syndrome in

MATERIAL AND METHODS:

Ayurved classics, Modern medicine text books, relevant published research article and internet source related this topic has been used for present research work.

DISCUSSION:

Modern aspect of metabolic syndrome:

Definition:

Causes:

The exact mechanisms of the complex pathways of metabolic syndrome are under investigation.

Following are the some causes of metabolic syndrome,

- Stress
- Overweight
- Sedentary lifestyle
- Aging
- Diabetes mellitus type 2
- Alcohol intake
- High calories food intake

Sign and symptoms:

The main sign of metabolic syndrome is central obesity (also known as visceral, male-pattern or apple-shaped adiposity), overweight with adipose tissue accumulation particularly around the waist and trunk.^[4]

Other signs of metabolic syndrome include high blood pressure, decreased fasting serum HDL cholesterol, elevated fasting serum triglyceride level (VLDL triglyceride), and impaired fasting glucose, insulin resistance, or prediabetes.

Diagnostic criteria:

The US National Cholesterol Education Program Adult Treatment Panel III (2001) requires at least three of the following:^[5]

- Central obesity: waist circumference \geq 102 cm or 40 inches (male), \geq 88 cm or 35 inches (female)
- Dyslipidemia: TG \geq 1.7 mmol/L (150 mg/dl)
- Dyslipidemia: HDL-C $<$ 40 mg/dL (male), $<$ 50 mg/dL (female)
- Blood pressure \geq 130/85 mmHg (or treated for hypertension)
- Fasting plasma glucose \geq 6.1 mmol/L (110 mg/dl)

Treatment:

Preventive measures:

Various strategies have been proposed to prevent the development of metabolic syndrome. These include increased physical activity (such as walking 30 minutes every day),^[6] and a healthy, reduced calorie diet.^[7] Many studies support the value of a healthy lifestyle as above. However, one study stated these potentially beneficial measures are effective in only a minority of people, primarily due to a lack of compliance with lifestyle and

diet changes.^[8] The International Obesity Taskforce states that interventions on a sociopolitical level are required to reduce development of the metabolic syndrome in populations.^[9]

Pharmacological measures:

The first line treatment is change of lifestyle (e.g., Dietary Guidelines for Americans and physical activity). However, if in three to six months of efforts at remedying risk factors prove insufficient and then drug treatment is frequently required. Generally, the individual disorders that compose the metabolic syndrome are treated separately. Diuretics and ACE inhibitors may be used to treat hypertension. Cholesterol drugs may be used to lower LDL cholesterol and triglyceride levels, if they are elevated, and to raise HDL levels if they are low. Use of drugs that decrease insulin resistance, e.g., metformin and thiazolidinediones, is controversial; this treatment is not approved by the U.S. Food and Drug Administration. Weight loss medications may result in weight loss.^[10] Restricting the overall dietary carbohydrate intake is more effective in reducing the most common symptoms of metabolic syndrome than the more commonly prescribed reduction in dietary fat intake.^[11]

Ayurved Concept of Metabolic syndrome:

Metabolic syndrome is result of improper metabolism. In Ayurveda metabolism is considered the function of Agni. Various

causes of metabolic syndromes like, sedentary lifestyle, oily, heavy food, excessive calory consumption and lack of exercise or physical exertion etc. mainly vitiate Agni especially *Medadhatvagni*. Above *Nidana* vitiate Agni, produce *aam*, *Kapha* and *Meda*. So metabolic syndrome can be said *Santarpana janya Vyadhi*. The diseases covered in metabolic syndrome like obesity, diabete mellitus type 2 and dyslipidemia are also comes under the umbrella *Santarpanottha Vyadhi*.

The main features of metabolic syndrome are obesity, dyslipidemia and diabetes. In Ayurveda above features have been mentioned as the result of *Medavaha Sroto dusti*.

So it can be said that, initial stage of metabolic syndrome can be compared with *medavaha Sroto dusti*.

In the middle stage metabolic syndrome turns in to type 2 diabetes mellitus and caoronary artery diseases. So it can be said as the condition of *sankara Vyadhi*.

In later stage of the metabolic syndrome, complication of specific diseases like acute pancreatitis, CAD due to hyper triglyceridemia, Diabetic retinopathy, neuropathy, nephropathy etc. due to diabetes mellitus and cerebral hemorrhage, hypertensive cardio-myopathy, hyper tensive retino and nephro pathy due to hypertension.

So with the gradual progress of the disease it gets worsened conditions and becomes difficult to treat.

So it is wise to treat this disease before it reaches to middle or later stage condition involving *vyadhi Shankarya* and *upadrva*.

Acharya Sushruta has mentioned *Shadvidha kriyakala* for early diagnosis of disease so that treatment can be planned as early as possible and further progress of disease can be stopeed.

Medavaha Sroto dusti is the initial stage of metabolic syndrome. So the *nidan* and *samprapti* of *medavaha srotasa dusti* can be helpful to understand Ayurved Aspect of metabolic syndrome.

For complete understanding of metabolic syndrome as per Ayurved perspective we can divide the condition of metabolic syndrome in three stages;

Stages of Metabolic syndrome	Conditions according the stage of metabolic syndrome	Ayurved correlation
Initial stage of metabolic syndrome	<ul style="list-style-type: none"> • Mild increase in waist circumferences • Pre diabetes • Pre hypertension • Mild dyslipidemia 	<p><i>Medavaha Sroto dusti:</i></p> <p><i>Atisthula Laxana</i> and <i>Prameha Purvarupa.</i></p>
Middle stage of metabolic syndrome	Obese patient having fully developed diabetes and hypertension with mild to moderate dyslipidemia	<p><i>Santrapana</i> and <i>Avaranajanya</i></p> <p><i>Madhumeha (Sthula pramehi)</i></p>
Later stage of metabolic syndrome	Obese patient having early changes of CAD and complication of diabestes and hypertention.	<p><i>Upadrava</i> of <i>Madhumeha, Sthaulya</i> and <i>Avarana.</i></p>

Initial stage of metabolic syndrome:

Patients having mild increase in waist circumferences, Prediabetes, Prehypertention and Mild dyslipidemia can be diagnosed as initial stage of metabolic syndrome.

Above condition of initial stage of metabolic syndrome can be compared with *Medavaha sroto dusti laxana.*

Hetu(Causes):

Nidana of Medavaha Sroto Dusti:

- Avyayama (Lack of exercise)
- Divasvapna (Daytime sleep)

- Medyanam Ati Bhakshanat (Excessive consumption of fatty and high calory diet)
- Varuni Ati Sevana (Excessive consumption of alcohol)

Linga (Sign and Symptoms):^[12]

Symptoms of medavaha sroto dusti include Atishula Laxana and purvarupa of Prameha.

Atisthula Laxana:^[13]

- Reduced life span and quality of life
- loss of enthusiasm
- loss of libido and difficulty in coitus
- weakness
- foul smell from body
- excessive perspiration
- excessive Appetite
- Excessive thirst

Purvarupa of Prameha:^[14]

- Curling of the hairs
- sweat tastness of mouth
- Numbness and burning in sole and palm
- Dryness of mouth, palate and throat
- excessive thirst or increased desire for water
- Laziness
- Accumulation of excretory products in body
- Numbness and burning in body parts
- Attraction of ants toward urine and body
- Turbid or vitiated urine

- foul body smell
- excessive sleep

Aushadha (Treatment protocol):^[15]

Treatment principal for *medavaha sroto dusti*:

Treatment of *medavaha sroto dusti* includes same principle of treatment of *Sthaulya*, like;

Chikitsa Sutra:

- *Kapha- medahara* and *vatanulomaka Anna pana*
- *Niruha basti* prepared with *Ruksh, Ushna* and *Tkshana Aushadha*
- *Udvardana* by *Ruksha Aushadha*

Drugs:^[16]

- Guduchi
- Bhadramusta
- Triphala
- Takrarista
- Madhu
- Vidangadi Lauha
- Yava+Amalaki pryoga
- Bilvadi Panchamula kwath with honey
- Agnimanth Svaras
- Shilajatu prayoga

Pathyapathya:

Pathya:

- Daily exercise
- Jirne Bhojana (to take food after complete digestion of previous food)

- Maximum use of Yava (Barely) and Purana Godhuma (Old Wheat) for food preparation.

Apathya:

Ahara:

- High calorie diet, like fast foods
- Fatty, heavy and oily food substances
- Excessive and daily use of meat
- Excessive use of milk/dairy products like curd, paneer, ghee, sweets
- Excessive alcohol consumption

Vihara:

- Lack of exercise
- Daytime sleep
- Adhyasana
- Vishamashana

Middle stage of metabolic syndrome:

It can be compared with *Avaranajanya madhumeha* In *Ayurveda*. Sushruta has mentioned it as *Sthula pramehi*.

Hetu(Causes):^[17]

- Excessive indulgence of Guru, Snigdha, Amla, Lavana rasa dominant diet
- Samashana
- Nava Anna and pana
- Excessive Sleep
- Excessive Seating on very comfortable seats
- Lack of exercise

- Very less mental exercise
- Lack of Samshodhana of vitiated and accumulated dosha

Linga(Sign and Symptoms):^[18]

Excessive increase of Shleshma and Pitta leads to Avaran of vata and ovstructed vata excrete Ojas with urine and so urine becomes like Madhu (Honey) in taste and colour which is called *Madhumeha*.

Patient feels *Ojas Kshaya Laxana* due to excessive secretion of ojas with urine. Patient feels either symptoms of Vata, Pitta or Kapha frequently and ultimately becomes emaciated.

Treatment:^[19]

Upakrma:

- *Langhana*
- *Rukshana*
- *Bruhana*
- *Snehana*

- In condition of excessive *dosha Samshodhana* like *vamana* and *virechana* should be given.
- If Dosha are moderately vitiated Vyayama and Pachana drugs can be used.
- Rukshana can be done with udavartana of powder of drugs having Kashaya, Ruksha and laghu properties.

After complete shodhana or samyaka langhana and Rukshana, Bruhana and Snehana should be performed.

Drugs:

- Phalatrikadi Kwath
- Nisha Amalaki
- Ayaskruti
- Shilajatu rasayan
- Khadir rasayana
- Tuvataka rasayana

Later stage of metabolic syndrome:

It can be compared with complicated case of Avarana and Madhumeha. If Madhumeha not treated timely and properly, its complication like carbuncles develops in vital parts and muscular area.

Upadrava of Avarana:

- Cardiac disease
- Abscess
- Splenomegaly
- Tumour in Maha Srotasa
- Diarrhea

Treatment:^[20]

Patient having complications due to avarana should be treated with Anabhishyandi, Snigdha, Shroto shodhaka, Vatanulomana and kapha, pitta Aviruddha drugs.

Rasyana Prayoga:

- Shilajatu with milk
- Guggulu
- Lasuna

CONCLUSION:

It can be concluded by above discussion that metabolic syndrome can be compared with *Medavaha Srotas Dusti*, *Apathyanimitaja Prameha* and *Updrava of Avarana* according to

its various stages. The treatment of metabolic syndrome and preventive measures depends upon the stage of metabolic syndrome.

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