

# Understanding Metabolic Syndrome Through the Lens of Traditional Indian Medicine

Dr Shubhangi Mishra<sup>1</sup>, Dr Sujata Rajan<sup>2</sup>

<sup>1</sup> MD Scholar, PG Department of Kriya Sharira, Ayurvedic and Unani Tibbia College and Hospital, New Delhi

<sup>2</sup> Associate Professor and HOD, PG Department of Kriya Sharira, Ayurvedic and Unani Tibbia College and Hospital, New Delhi

Corresponding Author: Dr Shubhangi Mishra

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## ABSTRACT

Each year, non-communicable diseases (NCDs) claim the lives of almost 40 million people, which accounts for around 70% of all fatalities worldwide. Since, major cause for these ailments are poor life style choices, these conditions are sometimes referred to as lifestyle disorders. One of such major life style disorder is Metabolic Syndrome, as we see the conception of syndrome, similar idea of cluster of diseases is mentioned as *vyadhisankar* by acharya Charak. *Vyadhisankara* (co-morbidity) is the term used for the co-existence phenomenon of diseases in an individual and in Metabolic Syndrome this co-existence is seen between central obesity, high plasma glucose levels, increased blood pressure and increased low density lipoproteins (LDL) and low HDL. Furthermore, for comprehending the underlying pathophysiology, the notion of *Shatkriya kala* has been taught by Acharya Sushruta. A better diagnostic strategy for metabolic syndrome can thus be devised using these ayurvedic Principles. This will provide opportunities for this disorder's conventional course of treatment and a way to prevent its spread by adhering to the ayurvedic lifestyle recommendations.

**KEYWORDS:** Metabolic Syndrome, *Vyadhisankar*, *Nidanarthak Roga*, Cardiovascular Disorders, Ayurvedic Diagnostic approach

## INTRODUCTION

Each year, non-communicable diseases (NCDs) claim the lives of almost 40 million people, which accounts for around 70% of all fatalities worldwide.<sup>1</sup> NCDs are the product of a confluence of elements, including genetics, physiology, environment, and behaviours. Since lifestyle decisions have a significant impact on NCDs such as cardiovascular diseases (CVD), stroke, diabetes, and some types of cancer, these conditions are sometimes referred to as lifestyle disorders.<sup>2</sup>

One of such major life style disorder is Metabolic Syndrome which is defined by WHO as a pathological condition

characterized by abdominal obesity, insulin resistance, hypertension, and hyperlipidaemia and its prevalence in present is approximately 25% of all adults and even more in advanced ages.<sup>3</sup>

Our ancient literature is so vast and there are wide descriptions of various diseases along with their causative factors and pathophysiology. when we dig into our texts deeply, even newly found diseases like life style disorder also show similar connection to what mentioned by our acharyas.

As Acharya Charak has stated in *trishothiyaadhyaya* of *Sutrasthana*,

न हि सर्वविकाराणां नामतोऽस्ति ध्रुवा स्थितिः।<sup>4</sup>

That means, all disorders cannot be given standard names. So, rather than focusing on the nomenclature, we must look for the similar sign and symptoms to draw a comparison between the diseases of recent times with the various *vyadhi* (diseases) mentioned by our acharyas depending upon the dosha and *dushya* involved to form the disease.

Similarly, as we see the conception of syndrome, similar idea of cluster of diseases is mentioned as *vyadhisankar* (co-morbidity) by acharya Charak. "*Vyadhisankara*" is the term used for the co-existence phenomenon of diseases in an individual<sup>5</sup> and in Metabolic Syndrome this co-existence is seen between central obesity, high plasma glucose levels, increased blood pressure and increased low density lipoproteins (LDL) and low HDL.

So, in an ayurvedic aspect pathology and manifestation of Metabolic Syndrome can be better understood through the concept of *vyadhisankar*.

### Aim and Objective

Understanding the concept of metabolic syndrome and establishing its ayurvedic counterparts.

### MATERIALS AND METHODS

References regarding *vyadhisankar* and other related terms are collected from *bruhat trayi* and *laghu trayi* and various text books. Different journals and previous research works are also referred to collect the information about Metabolic Syndrome and other relevant topics.

### LITERATURE REVIEW

#### Introduction to the Metabolic Syndrome;

The term "metabolic syndrome" (MetS) refers to a collection of symptoms that indicate excessive calorie intake, sedentary habits, and the ensuing excess adiposity.

■ According to the NCEP ATP III definition, metabolic syndrome is present if three or more of the following five criteria are met:<sup>6</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

#### Pathophysiology of metabolic syndrome

Initially, key factor to diagnose Metabolic Syndrome was Insulin Resistance because the chain of reactions which leads to multiple anomalies associated with MetS in the body starts with insulin resistance. In order to exert its anabolic effects, insulin, a peptide hormone secreted by the pancreatic beta cells in response to high blood sugar, inhibits lipolysis and hepatic gluconeogenesis while increasing glucose uptake in the liver, muscles, and adipose tissues. However, when insulin resistance develops in adipose tissue, the process of lipolysis is impaired, which in turn increases the amount of FFAs in the blood. Additionally, the synthesis of TGs, cholesterol esters, and VLDL tends to rise with an increase in FFA concentration. This cascade activates CETP (cholesterol ester transfer protein), which then catalyses the conversion of TGs into VLDL and HDL, boosting HDL clearance while lowering HDL concentration. HTN is now developing as a result of the loss of insulin's vasodilatory action and the vasoconstriction caused by FFA<sup>7</sup>, due to reactive oxygen species production of subsequent scavenging of nitric oxide.

This means not a single factor but the cumulative effect of all these occurrences results in the emergence of metabolic syndrome.<sup>8</sup>

#### Infirmities in ayurveda relating to metabolic syndrome;

Acharya Charak in *apasmara nidana adhyaya* has stated that

कश्चिद्धि रोगो रोगस्य हेतुर्भूत्वा प्रशाम्यति । न प्रशाम्यति चाप्यन्यो हेत्वर्थं कुरुतेऽपि च ॥

एवं कृच्छ्रतमा नृणां दृश्यन्ते व्याधिसङ्कराः । प्रयोगापरिशुद्धत्वात्तथा चान्योन्यसंभवात् ॥<sup>9</sup>

Which means, some diseases subside but become the cause for other diseases or deformities while some diseases persist in our body even after causing other fatal ailments.

This way, these cluster of various pathological conditions are considered as *Vyadhisankar* which is very difficult to cure due to association of multiple diseases creating a vicious cycle and also due to unavailability of proper treatment.

Chakrapani has named *Vyadhisankar* as *Vyadhimelak* i.e., a combination or group of disorders. which he regarded as *krichhatama*, or difficult to cure due to *prayoga-aparishuddhatwat* and *Anyonyasambhavaat* or *parasparakaranarootatwat*.

*prayoga-aparishuddhatwat* means improper treatment approach towards the disease. Which he explained through an example of *stambhan kriya* on *Amaatisara* which leads to the development of *shool Aanah* and *aadhman*.

*Anyonyasambhavaat* or *parasparakaranarootatwat* means having similar causative factors or serving as a cause for one another. Like, *Pratishyaya*, *Kasa* and *Rajyakshma*.

Another term which is very similar to *Vyadhisankar* is *Nidanarthak roga*.

### निदानार्थकरो रोगो रोगस्याप्युपलभ्यते ||<sup>10</sup>

i.e., Diseases can act as causative factors of other diseases as well or in other terms When one disease has potential to cause another disease if left untreated or due to low immunity of the patient it is called *nidanarthak roga*. Acharya Charak has explained *Jwara*, *Raktapitta*, *Gulma* and *Shosha* as *nidanarthak roga* also *pratishaya* is said to be a *nidanarthak vyadhi* for *kasa*.

and these *Nidanarthak roga* can be *ubhayarthak* or *ekarthak*. A primary illness is said to be *Ubhayarthakari* if it persists even after causing a secondary illness, whereas *Ekarthakari* is used to describe a primary illness which subsides following the advent of a secondary disease.

Regardless of all these conditions another term *Updrava* (Complication) is mentioned by Charak and Sushruta acharyas.

### पूर्वोत्पन्नं व्याधिं जघन्यकालजातो व्याधिरुपसृजति, स तन्मूल एवोपद्रवसञ्ज्ञः||<sup>11</sup>

i.e., an initial illness may eventually acquire a serious consequence if it is persistent. Or, उपद्रवस्तु खलु रोगोत्तरकालजो रोगाश्रयो रोग एव स्थूलोऽणुर्वा, रोगात् पश्चाज्जायत इत्युपद्रवसञ्ज्ञः |<sup>12</sup>

it means *updrava* is a complication manifesting in the later period of the disease which can be major or minor.

Acharya charak also said that since the *updrava* is rooted in the same disease it usually pacifies as soon as the main disease is cured.

Despite the fact that they all appear to have similar meanings, each of these phrases has a separate connotation in terms of the various illnesses.

### DISCUSSION

By taking a parallel look at both the ayurvedic and modern aspects, it seems cluster of diseases is very similar to the concept of *Vyadhi Sankar* because in modern medical term syndrome is a set of symptoms or conditions that occur together which suggest the presence of a particular disease or as a possible chance of developing additional morbidities. And in Ayurveda this phenomenon is known as *Vyadhisankar*.

Though it may seem similar but concept of *nidanarthak vyadhi* is still different from the concept of *Vyadhisankar* because *vyadhisankar* is the co- occurrence of two or more diseases at a single period of time whereas *nidanarthak roga* leads to the development of another disease or a complication with or without the presence of the previous ailment. In terms of MetS, all pathogenic conditions, together carry the potential to cause cardiovascular diseases in near future, if not controlled or treated. In other words, as we describe in ayurveda, we can say that Metabolic Syndrome serve as a *Nidanarthak Vyadhi* for the development of

Cardio Vascular Diseases. Since, the key factor for the development of Metabolic Syndrome is visceral obesity which overtime develops Insulin resistance that leads to the

pathogenesis of related fatal conditions further causing the risk for CVD as illustrated in the figure below.



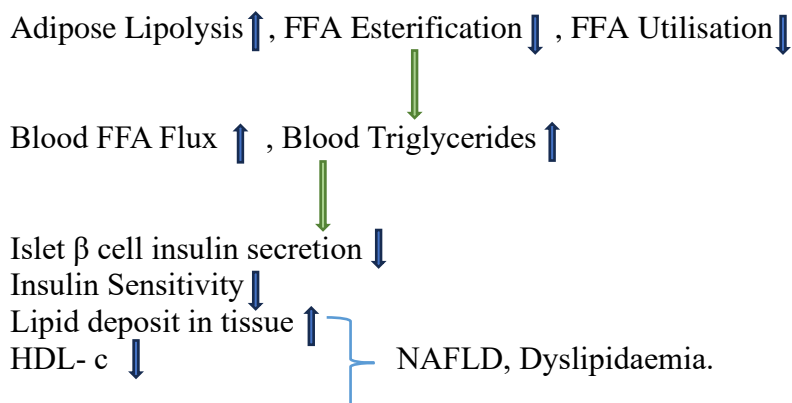
Fig. 1 explaining role of insulin resistance in causing Hyperglycemia, Hypertension and Lipolysis.

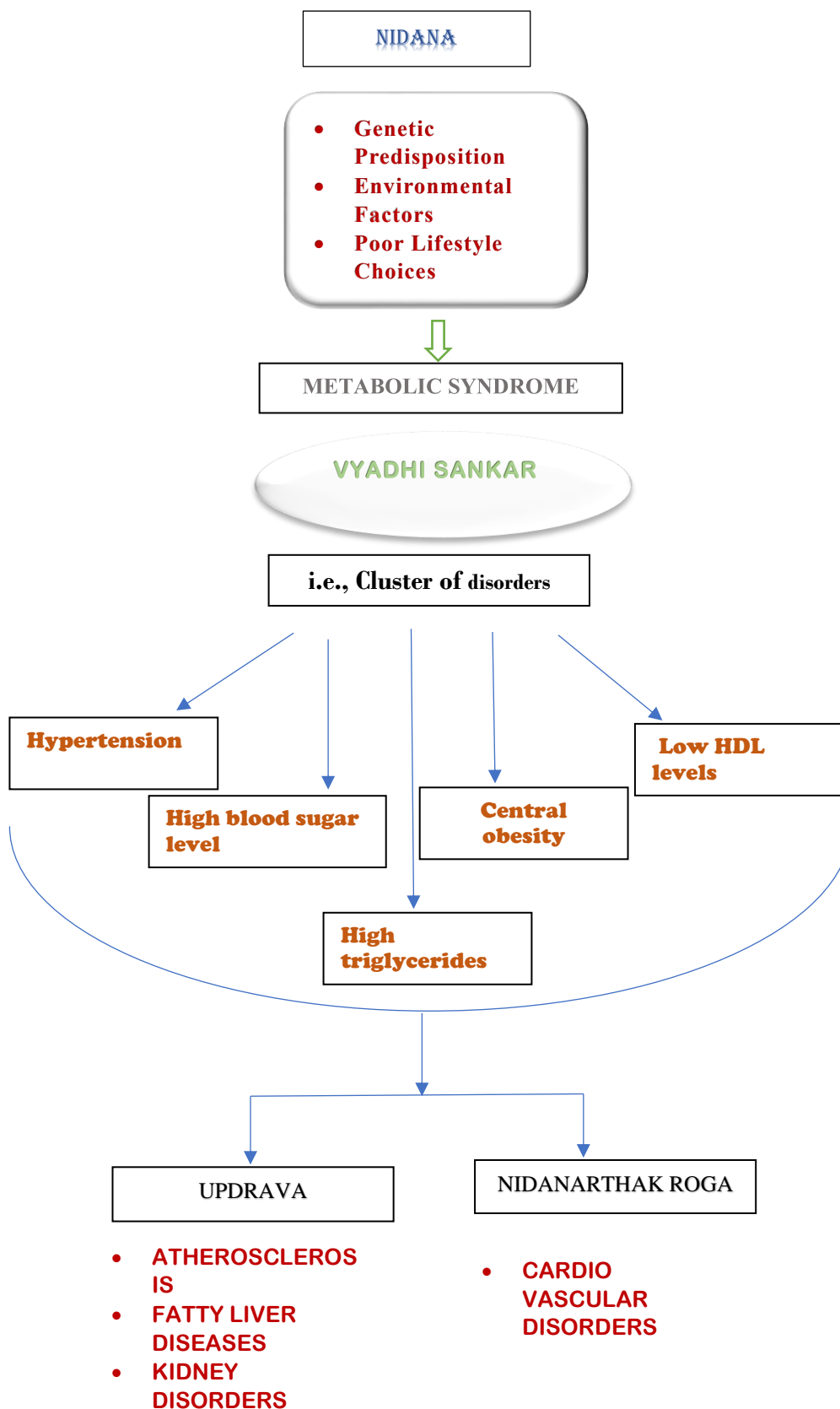
Not only metabolic syndrome but both the concepts can be well understood in terms of most of the modern diseases we are facing nowadays, especially the life style disorders because unhealthy life style & poor dietary habits, are not just the cause for a single disease but the reason for various systemic disorders co-existing in our body.

As we also discussed the term “*updrava*” which means complications. pertaining to the metabolic syndrome, it can be correlated with the Atherosclerotic changes, fatty liver disease etc. Endothelial damage and

dysfunction, LDL-Cholesterol deposition, and recruitment of monocytes in smooth muscle cells in the arterial wall are all known to have a role in the onset and development of atherosclerosis.<sup>13</sup>

although, NAFLD's pathophysiology is not well understood. but it can be linked to insulin resistance and related hyperinsulinemia, elevated inflammatory mediators, and most importantly increased FFA flux to the liver<sup>14</sup>. The probable sequence of events is explained below-





All these associations might lead to a more effective diagnostic method for the metabolic syndrome based on the ayurvedic principles

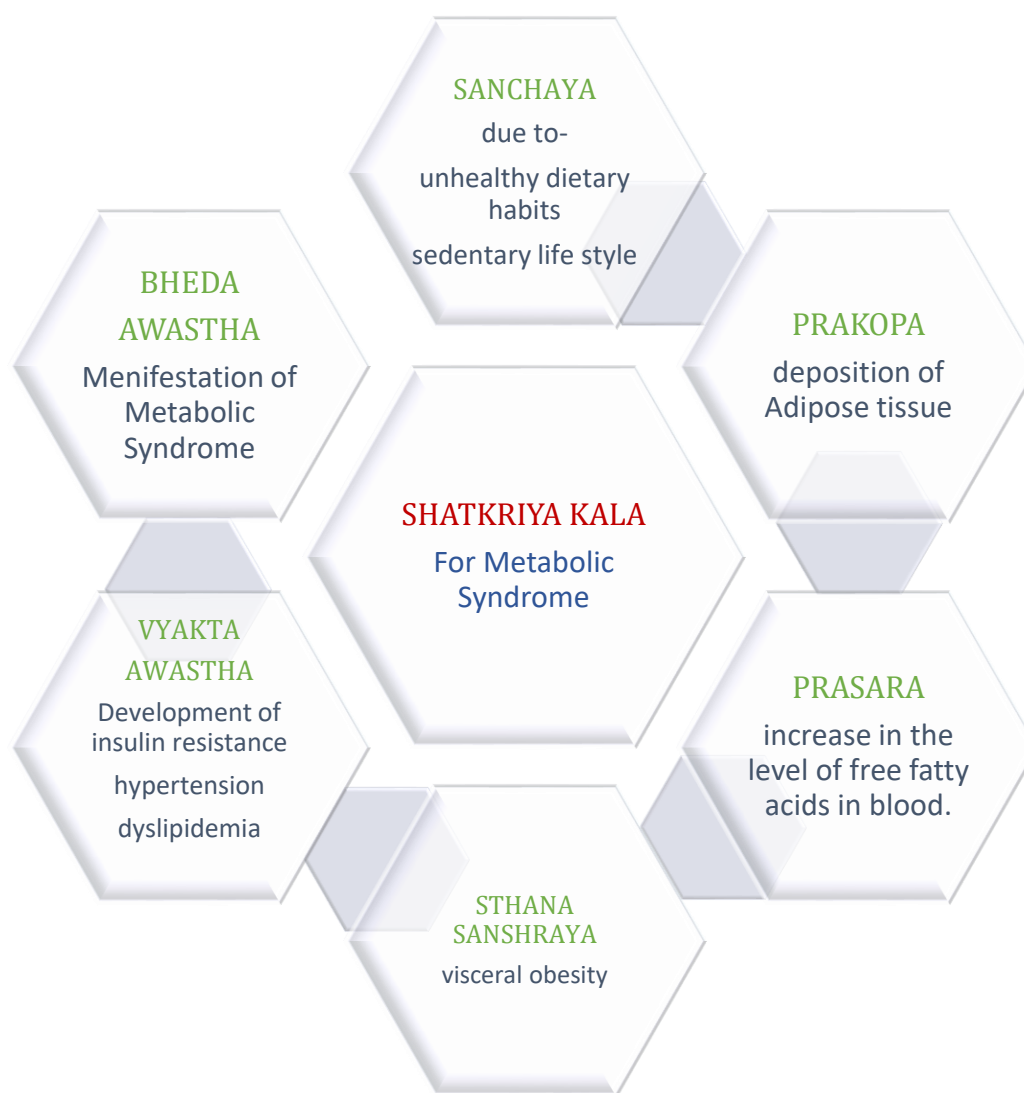
we follow. Also, for development of efficient treatment modalities, it's crucial to treat illnesses connected with metabolic syndrome

as a whole rather than concentrating on a particular condition.

Despite of being an ancient science, Ayurveda has already explained various and advanced methods to diagnose a disease by examining a patient's condition and by decoding the possible manifestation of the developed disease. This examination is known as *pareeksha*. *Dashavidha pareeksha* (*rogi parkeesha*), *Ashtasthana pareeksha*, *Shadvidha pareeksha*, *Panchvidha*

*pareeksha*, *Trividha pareeksha*, etc. are only a few of the several forms of *pareeksha* that may be found in traditional Ayurvedic books.<sup>15</sup>

Furthermore, for comprehending the underlying pathophysiology, the notion of *Shatkriya kala* has been taught by Acharya Sushruta<sup>16</sup> which covers the six phases of the disease's etiopathology, starting with its origin and ending with the emergence of complications.



due to the fact that the illness worsens over time as each stage develops, treating the illness as soon as it manifests i.e., at the stage of *sanchayawastha*, can help prevent the disease's potential consequences and if only one of the many conditions is taken into consideration for the treatment of a syndrome

it can lead to more complications due to the avoidance of other factors as Acharya Charak also explains, *Aparishuddha chikitsa* can lead to *Vyadhisankar*.

So, a comprehensive approach is thus needed to treat metabolic syndrome.

## CONCLUSION

Despite the fact that our ayurvedic scriptures do not specifically address metabolic syndrome, the term *Vyadhi Sankar* and its manifestation describe a syndrome with a similar notion. In light of this, a comparison can be made, and MetS's pathophysiology and diagnosis can be approached using an ayurvedic method of *Shatkriyakala* which not only focuses on the step-by-step development of a disease but also emphasises on the early diagnosis and treatment of the disease before it develops complications and leads to further morbidities. Since, it also serves as a *nidanarthak rog* for CVD which is a leading cause of sudden mortality in the modern era, the whole community will benefit if we research in this field to comprehend the pathophysiology and many aspects that contribute to the development of this disease and only then, by employing our conventional treatment techniques, we will be able to impart the principles of healthy living from ayurveda with more practicality and bring the incline of this disease to a halt.

### Declaration by Authors

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