

PRAMEHA, HETU AND SAMPRAPTI VICHAR: IN TODAY'S CONTEXT

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ABSTRACT

This conceptual study is to explore and interpret the *Hetus* i.e. causes of *Prameha* in today's era in comparison with *Hetus* described in *Ayurvedic* texts. To explore and interpret *Hetus* of *Prameha* in contemporary lifestyle which may be triggering pathophysiology of *Prameha* described in *Ayurvedic* texts. Explored *Brihatrayi*, for relevant references regarding concept of *Prameha* (*Hetus* - causes and *Samprapti* - pathophysiologic process). **Results:** *Viruddhashana* (eating non-compatible food), eating without judging *Agni* (digestive capacity), *Adhyashana* (consumption of food before the previous food get digested) are most profound features of today's food culture. **Discussion:** 1) Consumption of more *Madhur Rasatmak Aahar*, lacking *Tikta, Kashay rasa*. 2) *Viruddhashan* and *Adhyashana*. 3) Food consumption without judging *Agni* and *Prakruti*. 4) Consumption of genetically incompatible food. 5) Lack of core exercise, irregular sleep patterns and having more sedentary but stressful life. This leads to *Prameha* described in *Ayurved* which has '*Prabhut avil mutrata*' as main symptom which today is recognised as Diabetes Mellitus. This causes metabolic syndrome showing hyperglycaemia, insulin resistance and insulin deficiency with impaired carbohydrate, lipids and protein metabolism.

Keywords: Exploring-Interpreting *Prameha Hetu* in today's era, *Prameha samprapti*

INTRODUCTION

India is becoming a new age hub for the life style disorder Diabetes Mellitus. When we call it as life-style disorder, its roots are in our lifestyle. As the impact of globalisation, Indians are having vast exposure to western lifestyle especially food culture. Indians are leaving back their traditional food culture replacing it with convenient western food culture. As a result we are coping with new age food which might not be genetically compatible to Indians. Growing urbanisation and sedentary lifestyle further more adding risk of being susceptible to acquire Pre-Diabetic conditions which may worsen into established picture of Diabetes Mellitus.

This conceptual study is to explore and interpret the *Hetus* i.e. causes of *Prameha* in today's era in comparison with *Hetus* described in *Ayurvedic* texts.

The use of the word 'Diabetes' for a disease involve the discharge of excessive amounts of urine.

In *Ayurved* too, cardinal sign of the disease is said as '*Prabhut avil mutrata*' i.e. discharge of profuse cloudy urine^{[1],[2],[3]}.

Diabetes is the most ancient known disease of the world. In *Ayurvedic* texts like *Charak* and *Sushrut Samhita* the disease has been very well recognised, classified and causes, pathophysiology, signs, symptoms, prognosis and treatment is described in quite length and depth.

Diabetes mellitus, often simply referred to as Diabetes, is a group of metabolic disorders in which a person has high blood sugar, either because the body does not produce enough insulin or because cells do not respond to the insulin that is produced.

HYPOTHESIS

To explore and interpret *Hetus* of *Prameha* in contemporary lifestyle which may be triggering pathophysiology of *Prameha* as described in *Ayurvedic* texts.

METHODS

References from *Ayurvedic* texts and modern science were explored , analysed, compared and interpreted.

Overviewed the most significant symptoms of diabetes.

The classical symptoms of diabetes are polyuria (frequent urination), polydipsia (increased thirst) and polyphagia (increased hunger).

Symptoms may develop rapidly (in weeks or months) in type 1 diabetes while in type 2 diabetes they usually develop much more slowly and may be subtle or absent.

There are three main types of diabetes:

Type 1 diabetes: results from autoimmune destruction of insulin-producing beta cells of the pancreas and body's failure to produce insulin , which presently requires the person to inject insulin. (Also referred to as insulin-dependent diabetes mellitus, IDDM for short and juvenile diabetes.) The subsequent lack of insulin leads to increased blood and urine glucose. The classical symptoms are polyuria (frequent urination), polydipsia (increased thirst), polyphagia (increased hunger), and weight loss. Type 1 diabetes is fatal unless treated with insulin.

Type 2 diabetes: results from insulin resistance, a condition in which cells fail to use insulin properly, sometimes combined with an absolute insulin deficiency. (Formerly referred to as non-insulin-dependent diabetes mellitus, NIDDM for short, and adult-onset diabetes.)

Gestational diabetes: is when pregnant women, who have never had diabetes before, have a high blood glucose level during pregnancy. It may precede development of type 2 diabetes mellitus^{[4],[5]}.

Causes and Pathophysiology :

In any type of Diabetes, process of pathophysiology revolves around glucose intolerance, insulin resistance i.e. the defective responsiveness of body tissues to insulin involving the insulin receptor and disturbance in cell signalling because of disturbed insulin pathway.

A strong inheritable genetic connection in type 2 diabetes, environmental factors (almost certainly diet and weight), chronic obesity (about 55 % of type 2 diabetes patients are obese at diagnosis) leading to increased insulin resistance, in pregnancy in Gestational Diabetes, gestational hormones further increasing glucose intolerance and insulin resistance.

A sedentary lifestyle plays a significant role in obesity. Worldwide there has been a large shift towards less physically demanding work so world's large part of population gets insufficient exercise^[6]. This is primarily due to increasing use of mechanized transportation and a greater prevalence of labour-saving technology in the home.

In children, there appear to be declines in levels of physical activity due to less walking and physical education.

World trends in active leisure time and physical activity are less clear. The World Health Organization indicates people worldwide are taking up less active recreational pursuits.

Several rare genetic syndromes as well as some congenital or acquired conditions :hypothyroidism, Cushing's syndrome, growth hormone deficiency and the eating disorders, binge eating disorder and night eating syndrome are recently being associated with increased prevalence of obesity^{[6],[7],[8]}.

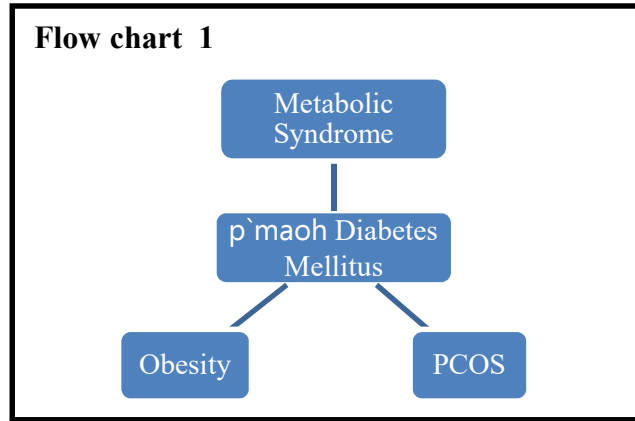
Metabolic syndrome, is a clustering of at least three of the five following medical conditions - abdominal (central) obesity, elevated blood pressure, elevated fasting plasma glucose, high serum triglycerides, low high-density lipoprotein (HDL) levels.

Nowadays Metabolic syndrome is associated with the risk of developing cardiovascular disease and type 2 Diabetes.

Insulin resistance, metabolic syndrome and prediabetes are closely related to one another and have overlapping aspects.

The syndrome is thought to be caused by an underlying disorder of energy utilization and storage. 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. Other signs of metabolic syndrome include high blood pressure, decreased fasting serum HDL cholesterol, elevated fasting serum triglyceride level (VLDL , triglyceride), impaired fasting glucose, insulin resistance or prediabetes.

Associated conditions include hyperuricemia, fatty liver, polycystic ovarian syndrome (in women), erectile dysfunction (in men), and nigrican acanthosis. Most of the patients are obese, sedentary and have a degree of insulin resistance. The most important risk factors are diet (particularly sugar-sweetened beverage consumption), genetics, sedentary behaviour or low physical activity, disrupted chronobiology / sleep. **Polycystic ovary syndrome (PCOS)** is a set of symptoms due to elevated androgens (male hormones) in women. Signs and symptoms of PCOS include irregular or no menstrual periods, heavy periods, excess body and facial hair, acne, pelvic pain, difficulty in getting pregnant, and patches of thick, darker, velvety skin. Associated conditions include type 2 diabetes, obesity, obstructive sleep apnoea, heart disease, mood disorders, and endometrial cancer. Metabolic syndrome, obesity, higher prevalence of insulin resistance seen in PCOS. Aetiology, clinical manifestation and pathophysiology of this syndrome is quite close to that of Diabetes type 2 ^{[9],[10]}.



Ayurved:

In *Ayurved*, *Prameha* is the condition caused by impairment of *Kapha Dosha* and *Jala Mahabhoot* i.e. disturbed metabolism of water compartments in the body giving laxity in body tissues especially in fat, muscle tissues giving them *Abaddha* (lax or hypotonic) and *Asamhat* (not compact or loose) consistency. *Kapha Dosha* vitiation mainly hampers fat or lipid metabolism leading to formation of *Kleda* (tissue waste products in liquid form dampening the body tissues). Excessive formation of *Kleda*, excessive evacuation of this *Kleda* in form of profuse, cloudy urine ‘*Prabhut avil mutrata*’ is cardinal symptom described. This excess *Kleda* bring *Shaithilya* in surrounding tissues like muscle, lymph, marrow, semen, fat and in advance stage putrefy them. Therefore these tissues are considered as *Dushya* or target tissues of *Prameha*. Formation *Kleda*, disturbed lipid metabolism are key points in pathophysiology of *Prameha* although all three *Dosha* are involved in the process^[11].

Tangled hair, sweetness in mouth, excess thirst, clogging of body orifices with slough, foul body smell, excessive sleep and lassitude

are prodromal symptoms described in *Ayurveda*^[11] suggesting deranged glucose metabolism, formation of excessive tissue waste, acidosis. In *Ayurved* Gestational Diabetes is called *Jatpramehi* in which person gets Diabetes because of genetic inheritance called *Beejdosha*. *Acharya Sushrut* has very distinctly classified *Prameha* in two categories, first being *Sahaja* and second being *Apathyasevanjanya* remain same even in today’s era. *Sahaja Prameha* is the one which is genetically acquired and *Apathyasevanjanya* means because of faulty diet and life style^[12].

Aetiological factors described in *Ayurved* like *Avyayam* (lack of exercise), *Swapnashayana* (over sleeping), *Pishta-snigdha annasevana*, (consumption of starchy and fatty food), *Kshir-ikshu vikar sevan* (consumption of milk and sugarcane products)^[13] are same even in the changed circumstances.

In modern age Indian population is adapting western food culture leaving behind their own and incorporating many food articles which traditionally not eaten and therefore genetically not compatible to them. Excessive use of soya bean products, cheese having much *styan* (sticky) property, butter (high con-

tent of trans fats and unsaturated fats), breads and pastas made of refined flour, cakes, pastries and chocolates with high glycaemic index along with lack of exercise and physical activity dampens *Agni* and aggravates *Kapha* and *Kleda* formation.

Because of urbanisation and fast life people are more going for convenience leading to *Adhyashana*, *Atyashana* which further dishonours *Agni* leading to vicious circle of formation of *Ama* and *Kleda*.

Once *Agni* deteriorates, metabolism lowers which results in blocking metabolic pathways, receptor desensitisation and faulty cell signalling. Causes of obesity and Diabetes Mellitus are same in modern science as well as in *Ayurved*.

Combination of excessive food - energy intake and lack of physical activity is thought to explain most cases of obesity . As societies becoming increasingly reliant on energy-dense, big-portions and fast-food meals, the association between fast-food consumption and obesity becoming more concerning.

It is generally accepted that the current food environment contributes to the development of Metabolic Syndrome, our diet is mismatched with our biochemistry.

Weight gain is associated with metabolic syndrome. Rather than total adiposity, the core clinical component of the syndrome is visceral and/or ectopic fat (i.e. fat in organs not designed for fat storage) whereas the principal metabolic abnormality is insulin resistance. The continuous provision of energy via dietary carbohydrate, lipid, and protein fuels, unmatched by physical activity/energy demand creates a backlog of the products of mitochondrial oxidation, a process associated with

progressive mitochondrial dysfunction and insulin resistance^{[14],[15]}.

The whole process of pathophysiology and causes associated with, very much resemble with the *Hetus* described in *Ayurved* and various events as consequence like *Agnivikruti*, *Medodhatudushti*, *Kledautpatti*, *KledaVa-hana* collectively recognised as *Prameha*.

PCOS is due to a combination of genetic and environmental factors. Risk factors include obesity, insufficient physical exercise and family history of someone with the condition.

Metabolic syndrome, PCOS come in the same domain of Diabetes Mellitus type 2 having similar genetic and environmental factors as triggers showing same symptomatology like obesity, insulin resistance, metabolic imbalance. Prevalence of these conditions is increasing day by day.

Results:

After rigorous investigations in *Ayurvedic* texts as well as in modern science sources it is observed that *Viruddhashana* (non-compatible food), eating without judging *Agni*, *Adhyashana* (eating food before the previous gets digested) are most profound features of today's food culture. More consumption of sugary food, carbohydrates, lack of physical activity ,in contrast to intake, sedentary lifestyle, are major players in creating pre-diabetic condition further leading to diabetic condition. Large intake of food and body's inability to use it, non-justifiable equation is created leading to obesity, blocking metabolic pathways and pushing patient into vicious circle are in short the events in the whole process of pathophysiology.

Obesity, Metabolic syndrome, pre-diabetic stage and diabetes seems the course of pathophysiology consisting overlapping features like obesity, increasing adiposity in the body, blocking metabolic pathway of lipids resulting in again increasing obesity, glucose intolerance, insulin resistance etc. Exactly same courses of pathophysiology has been postulated and described in *Ayurvedic* texts.

DISCUSSION

Ayurved believes *Kapha* is the main culprit *Dosha* in *Pramehasamprapti* (pathophysiology of Diabetes Mellitus) though *Vata* and *Pitta* can be associated *Dosha*. Excess *Kapha* and *Kleda* formation might be associated to receptor insensitivity and cellular signal failure because of its *Aavark* (blocking) property.

The glucose concentration in the blood is raised beyond its renal threshold (about 10 mmol/L), reabsorption of glucose in the proximal renal tubules is incomplete, and part of the glucose remains in the urine (glycosuria). This increases the osmotic pressure of the urine and inhibits reabsorption of water by the kidney, resulting in increased urine production (polyuria) and increased fluid loss. Lost blood volume is replaced osmotically from water held in body cells and other body compartments, causing dehydration, increased thirst and sweet taste in mouth.

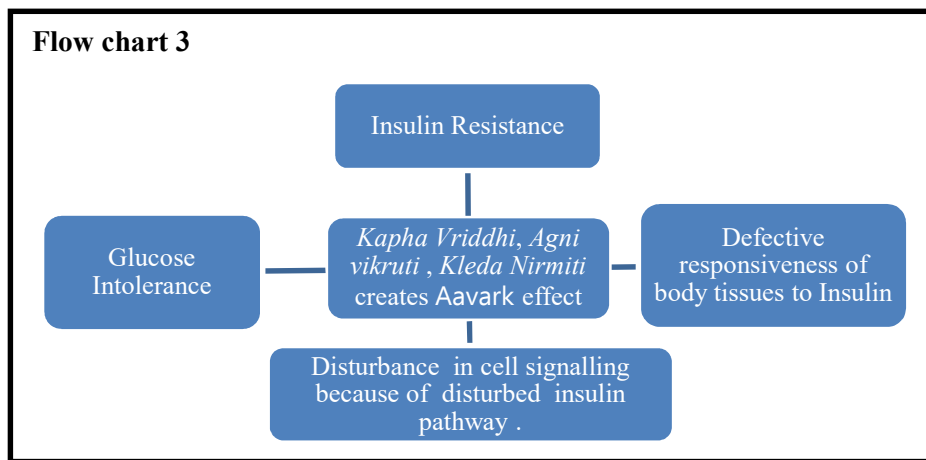
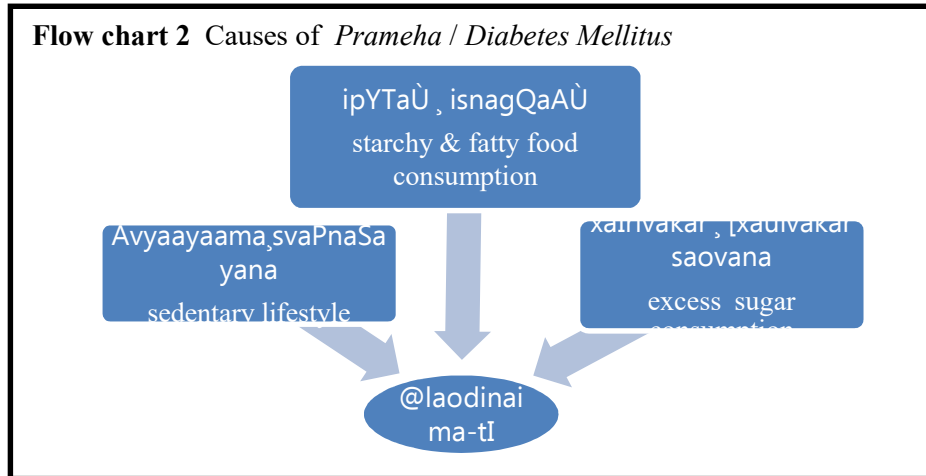
Paridah (burning peripheral body parts palms, soles etc.), *Anganam Suptata* numbness in

extreme body parts) are the symptoms described caused by peripheral neuritis. *Shatpadapiplika sharimutrabhisranam*, *Makshikopsarpana* in *Charak* and *Sushrut Samhita* respectively means high glucose concentration in body and excreted in the urine which attracts ants.

Prolonged high blood glucose causing glucose absorption, leading to changes in the shape of the lenses of the eyes, resulting in vision changes. Blurred vision, an altered states of consciousness, erectile dysfunction, number of skin rashes can occur in diabetes that are collectively known as diabetic dermatomes are suggestive of involvement of *asa*, *Rakta*, *Mansa*, *Majja* and *Shukra Dhatus* in pathophysiology which are called *Dushya*.

Type 1 and gestational diabetes is because of insulin resistance or failure of cells to recognise insulin at receptor level.

All the causes associated with pathophysiological process in developing Diabetes Mellitus and allied syndromes, very closely resemble with causes described in *Ayurveda* like *Avyayaama* (Lack of exercise), *Swapnashayan* (excess sleeping), *Pishta-snigdha ananasevana* (excess eating starchy-fatty food), *Ksheer-Ikshuvikar* (milk and sugarcane products) and consumption of any type of food which may cause water retention disturbing metabolic pathways are the causes initiating pathophysiology of Diabetes Mellitus.



CONCLUSION

Following are the key *Hetus* considered to develop Diabetes Mellitus :

1) Consumption of more *Madhur rasa Pradhan Aahar*, lacking *Tikta, Kashayrasa*. *Madhur rasa* is *Kapha Doshatmaka* and having *Jala Mahabhoot* in it. In *Prameha*, *Kapha dosha* and *Jala mahabhoot* are main factors which get vitiated giving *Abaddha* and *Asamhat* consistency. Consumption of more *Madhur rasatmaka Ahar* can be interpreted as more energy dense food.

2) *Atyashana, Adhyashana* and *Virudhashan*- Consumption of large food portion, eating disorders, binge eating and consumption of genetically incompatible food are major play-

ers in causing obesity and further leading to metabolic disorder.

3) Food Consumption without judging *Agni* and *Prakruti* – Food should be genetically compatible and relevant to energy need of the body otherwise it will lead to metabolic blockage and insensitiveness of cells.

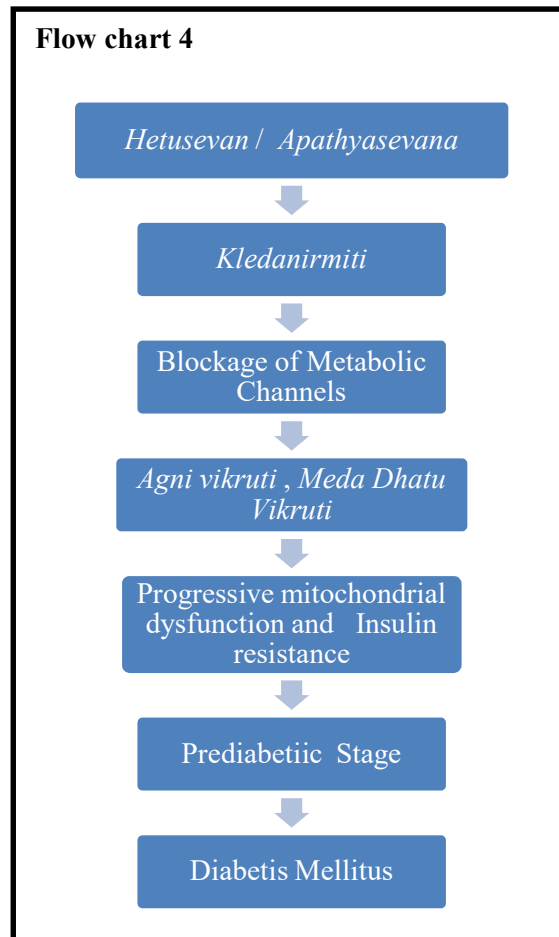
4) Inclusion of genetically incompatible food- Genetically incompatible food plays important role in pathophysiology of type 2 diabetes mellitus as such food does not get digested and assimilated causing blocking the cellular pathways.

5) More consumption of starchy and fatty food - starchy and fatty food is *Madhur rasatmaka* in *Ayurvedic* context. Over consump-

tion of *Madhura rasa* leads to derangement in carbohydrate and fat metabolism which causes glucose intolerance and insulin resistance.

6) Lack of core exercise, irregular sleep patterns & having more sedentary but stressful life- these factors become responsible for unjustified equation between energy intake and energy consumption which ultimately leads to

PATHOPHYSIOLOGY SUMMARISED AS FOLLOW :



obesity, glucose intolerance and insulin resistance.

This leads to *Prameha* described in *Ayurved* which has '*PrabhutAvilMutrata*' as main symptom which today is recognised as Diabetes Mellitus .

The domain of Diabetes Mellitus consists metabolic syndrome showing Hyperglycaemia, Insulin resistance and Insulin deficiency with impaired carbohydrate, lipids and protein metabolism.

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