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A CONCEPTUAL STUDY OF *MADHUMEHA* WITH SPECIAL REFERENCE TO TYPE 2 DIABETES MELLITUS

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ABSTRACT

Background *Madhumeha* is a chronic metabolic disorder described under *Prameha* and characterized by excessive passage of sweet, turbid urine along with disturbances in carbohydrate, fat, muscle, and fluid metabolism. Its development is mainly associated with excessive intake of heavy, unctuous and sweet food, physical inactivity, daytime sleep, obesity and genetic susceptibility. Type 2 diabetes mellitus is similarly a chronic metabolic disease characterized by persistent hyperglycaemia resulting from insulin resistance and progressive impairment of insulin secretion. The similarities in causative factors, clinical presentation, chronicity and complications provide a rational basis for a comparative conceptual study. **Aim and Objectives** To critically study the Ayurvedic concept of *Madhumeha* and examine its conceptual relationship with type 2 diabetes mellitus. The study also aims to analyze its causes, pathogenesis, clinical features, complications and fundamental management principles. **Materials and Methods** A narrative review was conducted using the *Brihatrayi*, *Madhava Nidana*, *Bhavaprakasha* and other standard Ayurvedic texts. Contemporary information was collected from diabetes guidelines, textbooks and relevant scientific literature. The available material was analyzed descriptively and interpreted through an Ayurveda-modern correlation.

Results The review showed important similarities between *Madhumeha* and type 2 diabetes mellitus in relation to sedentary behaviour, excessive nutrition, obesity, genetic susceptibility, polyuria, polydipsia, fatigue and progressive metabolic dysfunction. *Kapha*, *Meda*, *Kleda*, *Mamsa*, *Rasa*, *Ojas* and *Basti* are major components of *Madhumeha Samprapti*. Insulin resistance, beta-cell dysfunction, hyperglycaemia and altered lipid metabolism represent the principal modern mechanisms. **Discussion** *Madhumeha* is not an exact textual equivalent of every case of type 2 diabetes mellitus, but substantial clinical and pathogenic similarities exist between the two conditions. Ayurvedic principles emphasize correction of diet, physical inactivity, obesity and impaired metabolism, which remain important components of modern diabetes management. **Conclusion** *Madhumeha* may be conceptually studied in relation to type 2 diabetes mellitus while maintaining the independent diagnostic frameworks of both systems. Integrated lifestyle modification, metabolic correction, regular monitoring and individualized treatment may support comprehensive patient care.

Keywords: *Madhumeha*; *Prameha*; Type 2 diabetes mellitus; *Meda*; Insulin resistance; Hyperglycaemia

Introduction

Diabetes mellitus is a chronic metabolic disease characterized by persistent hyperglycaemia resulting from defects in insulin secretion, insulin action or both. Type 2 diabetes mellitus is its most common form and develops through a complex interaction of genetic susceptibility, excess adiposity, insulin resistance, progressive pancreatic beta-cell dysfunction and environmental factors. The International Diabetes Federation estimated that approximately 589 million adults aged 20–79 years were living with diabetes globally in 2024, demonstrating its enormous and continuing public-health burden.¹

Ayurveda describes a broad group of urinary and metabolic disorders under the term *Prameha*. Twenty varieties are classified according to the predominant *Dosha*, including ten *Kaphaja Prameha*, six *Pittaja Prameha* and four *Vataja Prameha*. *Madhumeha* is principally described as a *Vataja Prameha* in which urine becomes sweet and resembles honey in its characteristics. The condition may arise directly through aggravation of *Vata* or may represent the advanced stage of inadequately treated *Kaphaja* and *Pittaja Prameha*.²

A conceptual comparison between *Madhumeha* and type 2 diabetes mellitus is useful because both conditions involve dietary excess, physical inactivity, adiposity, frequent urination, excessive thirst, weakness and progressive systemic complications. However, the two should not be treated as completely identical entities. *Madhumeha* is understood through *Dosha*, *Dushya*,

Agni, Srotas, Kleda, Ojas and individual constitution, whereas type 2 diabetes is defined through biochemical diagnostic criteria and modern pathophysiology. A balanced comparison can identify areas of similarity without forcing direct equivalence between two different medical systems.³

Aim and Objectives

Aim

To conduct a conceptual study of *Madhumeha* with special reference to type 2 diabetes mellitus.

Objectives

1. To review the Ayurvedic concept of *Madhumeha* in relation to *Nidana, Purvarupa, Rupa, Samprapti, Upadrava* and management principles.
2. To review the causative factors, pathophysiology, clinical manifestations, diagnosis and complications of type 2 diabetes mellitus.
3. To identify similarities and differences between *Madhumeha* and type 2 diabetes mellitus.
4. To understand the preventive and therapeutic importance of diet, exercise and metabolic correction.

Materials and Methods

This narrative conceptual review was based on information collected from the *Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Madhava Nidana, Bhavaprakasha* and relevant Ayurvedic commentaries. Contemporary information regarding type 2 diabetes mellitus was obtained from standard medical textbooks, the International Diabetes Federation Diabetes Atlas and the American Diabetes Association Standards of Care. The collected material was arranged under etiological, pathogenic, clinical, diagnostic and therapeutic headings and was critically analyzed to identify areas of conceptual similarity and difference.

Ayurvedic Review

Madhumeha

The term *Madhumeha* is formed from two words, *Madhu*, meaning honey or sweetness, and *Meha*, derived from the root indicating excessive flow or urination. It describes a condition in which the patient passes urine that is excessive in quantity, sweet in nature and comparable to honey in colour or taste. Classical descriptions indicate that the disorder is not limited to the

urinary system. It is a systemic metabolic condition involving multiple *Dosha*, tissues, metabolic waste products and body channels.⁴

Classification of *Prameha*

Prameha is broadly classified according to *Dosha* predominance. The greater number of *Kaphaja* varieties reflects the major role of *Kapha* during the initial stage. Continued exposure to causative factors and failure to initiate proper management may result in the involvement of *Pitta* and eventually *Vata*. This progression represents increasing tissue impairment and worsening prognosis.

Predominant <i>Dosha</i>	Number of varieties	General characteristics	Prognosis
<i>Kapha</i>	10	Excessive, turbid, slimy, pale or dense urine	Generally <i>Sadhya</i>
<i>Pitta</i>	6	Yellow, blue, blackish, hot, salty or foul-smelling urine	Generally <i>Yapya</i>
<i>Vata</i>	4	Sweet, fatty, marrow-like or honey-like urine	Generally <i>Asadhya</i> or difficult to treat
Total	20	Different urinary appearances with systemic metabolic disturbance	Depends upon chronicity, constitution and tissue damage

Types of *Madhumeha*

Classical interpretation recognizes two major pathogenic presentations of *Madhumeha*:

1. **Avaranajanya *Madhumeha*:** It commonly occurs in an obese or strongly built person. Aggravated *Kapha*, *Meda* and other tissues obstruct the normal movement of *Vata*. The obstructed *Vata* becomes aggravated and carries *Ojas* towards the urinary system.
2. **Dhatukshayajanya *Madhumeha*:** It occurs following progressive depletion of body tissues. Aggravated *Vata* dominates the clinical picture, producing weakness, emaciation and loss of vital body components through urine.

These presentations are clinically important because the therapeutic approach for an obese, overnourished patient differs from that required for a lean, weak and tissue-depleted patient.

Nidana of *Madhumeha*

The causes of *Madhumeha* mainly include dietary excess, physical inactivity and behavioural practices that increase *Kapha*, *Meda* and *Kleda*. Classical texts describe repeated consumption of

newly harvested grains, excessive dairy products, sugarcane preparations, sweet and fatty foods, meat of aquatic or marshy animals, curd and heavy meals. Daytime sleep, avoidance of physical activity, prolonged sitting, excessive comfort and lack of mental or physical exertion further promote the disease process. Genetic or familial susceptibility is recognized through the concept of *Sahaja Prameha*.⁵

Category	Important causative factors
Dietary causes	Excessive <i>Madhura, Guru, Snigdha, Picchila</i> and <i>Abhishyandi Ahara</i>
Food substances	New grains, milk products, curd, sugarcane preparations and excessive fatty food
Behavioural causes	<i>Avyayama, Divasvapna</i> , prolonged sitting and excessive comfort
Constitutional factors	<i>Kapha Prakriti</i> , tendency towards <i>Sthaulya</i> and excessive <i>Meda</i>
Hereditary factors	<i>Sahaja</i> or familial susceptibility
Disease-related factors	Long-standing untreated <i>Prameha</i> and progressive tissue disturbance

Purvarupa

The premonitory manifestations of *Prameha* appear before the fully developed disease. These include excessive accumulation of dirt over the teeth, palate and body; stickiness of the skin; burning sensation of the hands and feet; excessive thirst; sweetness in the mouth; excessive sleep; lethargy; foul body odour; rapid growth of hair and nails; attraction of ants or insects towards urine; and turbidity or abnormality of urine. Early recognition of these features provides an opportunity to initiate preventive intervention before advanced metabolic disturbance develops.⁶

Rupa or Clinical Features

The cardinal feature of *Madhumeha* is the frequent passage of excessive urine having characteristics similar to honey. The urine may be sweet, astringent, pale or honey-coloured and may attract ants. Other manifestations may include excessive thirst, excessive hunger, fatigue, heaviness, lethargy, dryness, burning sensation, numbness of the hands and feet, excessive sweating, delayed wound healing and progressive weakness.

Ayurvedic manifestation	Clinical interpretation
<i>Prabhuta Mutrata</i>	Increased quantity or frequency of urination

<i>Avila Mutrata</i>	Turbid urine
<i>Madhura Mutrata</i>	Glucose or sweetness in urine
<i>Pipasa Adhikya</i>	Excessive thirst
<i>Kshudha Adhikya</i>	Increased hunger
<i>Kara-Pada Daha</i>	Burning sensation in hands and feet
<i>Kara-Pada Suptata</i>	Numbness of the extremities
<i>Daurbalya</i>	General weakness or fatigue
<i>Atisveda</i>	Excessive sweating
<i>Vrana Chirasadhyata</i>	Delayed wound healing
<i>Sthaulya</i>	Obesity or excessive adiposity
<i>Karshya</i>	Emaciation in advanced disease

Dosha and Dushya Involvement

Although *Madhumeha* is classified under *Vataja Prameha*, the disease process commonly begins with the aggravation of *Kapha*. The major *Dushya* include *Meda*, *Mamsa*, *Kleda*, *Shukra*, *Shonita*, *Vasa*, *Majja*, *Lasika*, *Rasa* and *Ojas*. *Meda* and *Kleda* are particularly important in the early stage because their increased quantity and abnormal quality contribute to obstruction, excessive moisture and urinary abnormalities. Long-standing disease leads to progressive loss of *Ojas* and depletion of tissues.⁷

Agni and Ama

Impairment of *Agni* is central to the metabolic interpretation of *Madhumeha*. Excessive consumption of heavy, unctuous and incompatible foods, together with physical inactivity, weakens normal digestion and tissue metabolism. Improperly processed nutrients promote *Ama*, abnormal tissue nourishment and excessive formation of *Kapha*, *Meda* and *Kleda*. Disturbance of *Medodhatvagni* may encourage abnormal accumulation of adipose tissue while simultaneously reducing the proper nourishment of subsequent tissues. Thus, the patient may appear overnourished externally but remain metabolically impaired internally.

Role of Meda

Meda is one of the principal tissues involved in *Prameha*. Excessive and abnormal *Meda* increases heaviness, softness, unctuousness and obstruction of body channels. It has a reciprocal

relationship with aggravated *Kapha* and *Kleda*. Increased *Meda* obstructs the normal movement of *Vata*, reduces physical activity and worsens metabolic dysfunction. This description shares conceptual similarities with central adiposity, ectopic fat accumulation and insulin resistance, although *Meda* should not be considered exactly identical to adipose tissue.

Role of *Kleda*

Kleda represents the physiological moisture required for normal tissue function. When its amount or movement becomes abnormal, it produces excessive fluidity, stickiness and turbidity. The kidneys and urinary system contribute to the regulation and elimination of this fluid component. In *Prameha*, abnormal *Kleda* enters the urinary channels and contributes to excessive and turbid urination. Frequent urine output subsequently causes thirst, dryness and gradual depletion.

Role of *Ojas*

Ojas is considered the essence of all body tissues and supports strength, stability, immunity and vitality. In *Madhumeha*, aggravated *Vata* carries *Ojas* towards the urinary system, resulting in its loss through urine. This explains the honey-like character of urine and the development of weakness, reduced vitality and susceptibility to complications. The classical description highlights that advanced *Madhumeha* is not merely a state of excess glucose but also a condition of progressive loss of essential body components.⁸

Srotas Involvement

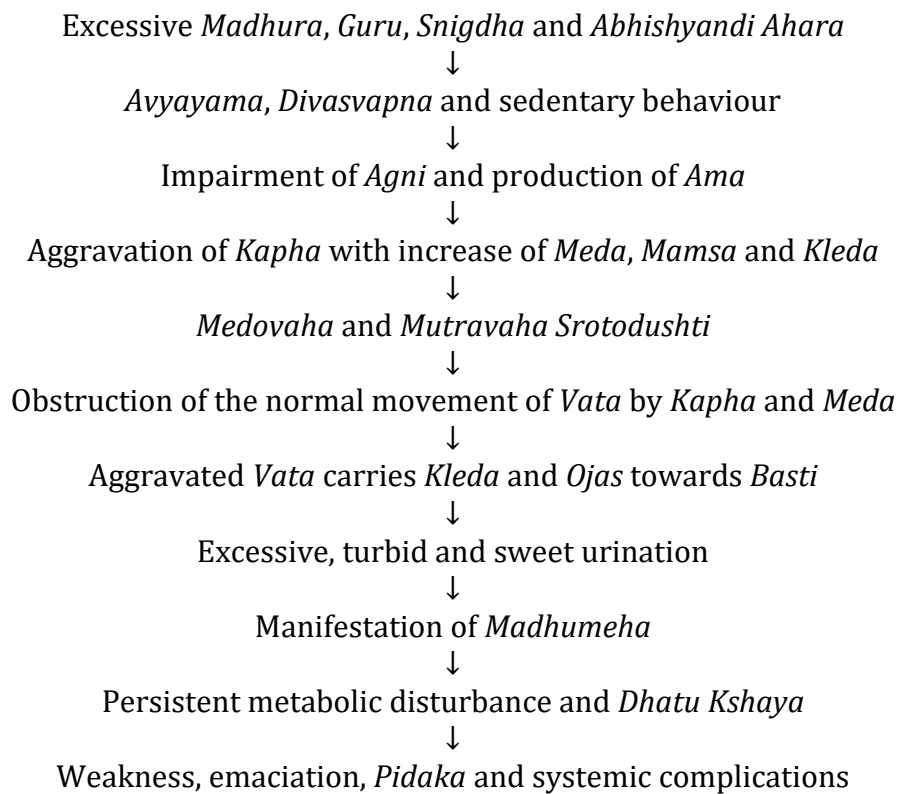
The principal channel affected is *Mutravaha Srotas*, but the pathogenesis also involves *Medovaha*, *Udakavaha*, *Annavaha* and *Rasavaha Srotas*. The functional origin of *Prameha* is associated with the gastrointestinal and metabolic region, while the urinary bladder acts as an important site of manifestation. Obstruction, excessive flow, abnormal tissue transport and improper metabolic transformation may coexist during different stages of the disease.

Samprapti Ghataka

Component	Involvement in <i>Madhumeha</i>
<i>Dosha</i>	Predominantly <i>Kapha</i> initially; <i>Pitta</i> and <i>Vata</i> later
<i>Dushya</i>	<i>Meda</i> , <i>Mamsa</i> , <i>Kleda</i> , <i>Rasa</i> , <i>Rakta</i> , <i>Vasa</i> , <i>Majja</i> , <i>Lasika</i> , <i>Shukra</i> and <i>Ojas</i>
<i>Agni</i>	<i>Jatharagni</i> and <i>Dhatvagni</i> <i>Mandya</i> , particularly <i>Medodhatvagni</i> disturbance

<i>Ama</i>	Metabolic by-products produced due to improper digestion and tissue transformation
<i>Srotas</i>	<i>Mutravaha, Medovaha, Udakavaha, Annavaha and Rasavaha Srotas</i>
<i>Srotodushti</i>	<i>Sanga and Atipravritti</i>
<i>Udbhava Sthana</i>	<i>Amashaya</i> and metabolic system
<i>Adhisthana</i>	Whole body with prominent involvement of <i>Basti</i>
<i>Vyaktasthana</i>	Urinary system and systemic tissues
<i>Rogamarga</i>	<i>Bahya and Abhyantara Rogamarga</i>
Nature	Chronic and progressive metabolic disorder

Samprapti of Madhumeha:



Upadrava of Madhumeha

Complications of *Prameha* include excessive thirst, loss of appetite, indigestion, fever, burning sensation, weakness, diarrhoea, muscular pain, excessive sleep, cough and respiratory discomfort. Advanced cases may develop *Prameha Pidaka*, which includes different varieties of

inflammatory swellings, abscesses, ulcers and difficult-to-heal lesions. These complications indicate impaired tissue nutrition, reduced resistance to infection and poor wound healing.⁹

Prameha Pidaka

Prameha Pidaka may develop when aggravated *Dosha* affects *Mamsa*, *Meda* and other tissues. They are commonly described over fatty or muscular regions and may progress into painful, deep and difficult-to-heal lesions. Their clinical significance may be compared cautiously with recurrent skin infections, diabetic ulcers, abscesses and diabetic foot lesions. Such complications require early detection because infection, neuropathy and impaired circulation can rapidly worsen the outcome.

Prognosis

Kaphaja Prameha is generally considered curable when detected early because the *Dosha* and affected tissues possess similar qualities and can respond to opposite dietary and therapeutic measures. *Pittaja Prameha* is regarded as manageable but difficult to cure completely. *Vataja Prameha*, including advanced *Madhumeha*, is generally considered difficult to treat because it is associated with chronicity, multiple tissue involvement and depletion of vital components. Hereditary disease, severe tissue loss and extensive complications further worsen the prognosis.

Ayurvedic Principles of Management

Nidana Parivarjana

Avoidance of causative factors is the first and most important principle. The patient should avoid excessive sweet, heavy, oily and processed foods; overeating; daytime sleep; prolonged sitting and physical inactivity. Treatment cannot produce sustained benefit if these factors continue. Dietary correction must be realistic, individualized and maintained over the long term.

Treatment According to Body Constitution

The patient's strength, body composition and stage of disease guide management. An obese and strong patient with predominance of *Kapha*, *Meda* and *Kleda* may require *Langhana*, *Rukshana*, controlled diet, exercise and appropriately selected purification procedures. A lean, weak or tissue-depleted patient requires careful nourishment, stabilization and milder treatment. Excessive depletion therapy in a weak patient may aggravate *Vata* and worsen the condition.¹⁰

Ahara

Foods having light, dry, scraping and *Kapha-Medohara* properties are traditionally preferred according to digestive capacity and clinical condition. Classical dietary choices include old grains,

barley, selected millets, green gram, bitter vegetables and appropriately prepared legumes. The dietary plan should control excessive caloric intake while maintaining adequate protein, fibre, micronutrients and hydration.

Vihara

Regular physical activity is strongly emphasized. Walking, structured exercise, physical work and reduced sedentary time help counteract *Kapha* and *Meda*. The intensity should be selected according to age, cardiovascular status, complications and exercise tolerance. Foot care and medical assessment are important before prescribing strenuous activity to patients with neuropathy, ulcers or vascular disease.

Shodhana and Shamana

Strong patients with excessive *Kapha* and *Meda* may be considered for carefully selected *Shodhana* procedures under expert supervision. *Vamana* or *Virechana* may be chosen according to *Dosha*, season and patient strength. *Shamana* treatment includes medicines with *Deepana*, *Pachana*, *Kledahara*, *Medohara*, *Lekhana* and *Pramehaghna* actions. These interventions should not replace essential glucose monitoring or prescribed antidiabetic medication.

Commonly Described Ayurvedic Drugs

Drug	Botanical name	Traditionally described action
<i>Guduchi</i>	<i>Tinospora cordifolia</i>	<i>Deepana</i> , <i>Rasayana</i> , <i>Medhya</i> and metabolic support
<i>Amalaki</i>	<i>Phyllanthus emblica</i>	<i>Rasayana</i> , antioxidant and tissue-supportive
<i>Haridra</i>	<i>Curcuma longa</i>	<i>Kaphahara</i> , <i>Kledahara</i> and anti-inflammatory
<i>Daruharidra</i>	<i>Berberis aristata</i>	<i>Kledahara</i> and <i>Pramehaghna</i>
<i>Jambu Bija</i>	<i>Syzygium cumini</i>	Traditionally used in <i>Prameha</i>
<i>Meshashringi</i>	<i>Gymnema sylvestre</i>	Traditionally used for excessive sweetness and urination
<i>Vijayasara</i>	<i>Pterocarpus marsupium</i>	<i>Kapha-Pittahara</i> and <i>Pramehaghna</i>
<i>Karavellaka</i>	<i>Momordica charantia</i>	Bitter, <i>Kapha-Medohara</i> and metabolic support
<i>Methika</i>	<i>Trigonella foenum-graecum</i>	Digestive and metabolic support
<i>Shilajatu</i>	Purified mineral exudate	<i>Rasayana</i> and <i>Pramehaghna</i> under supervision

Clinical caution: Selection, dose, duration and safety assessment must be individualized. Concurrent use with insulin or oral glucose-lowering medicines can increase the risk of hypoglycaemia and therefore requires professional supervision.

Modern Review of Type 2 Diabetes Mellitus

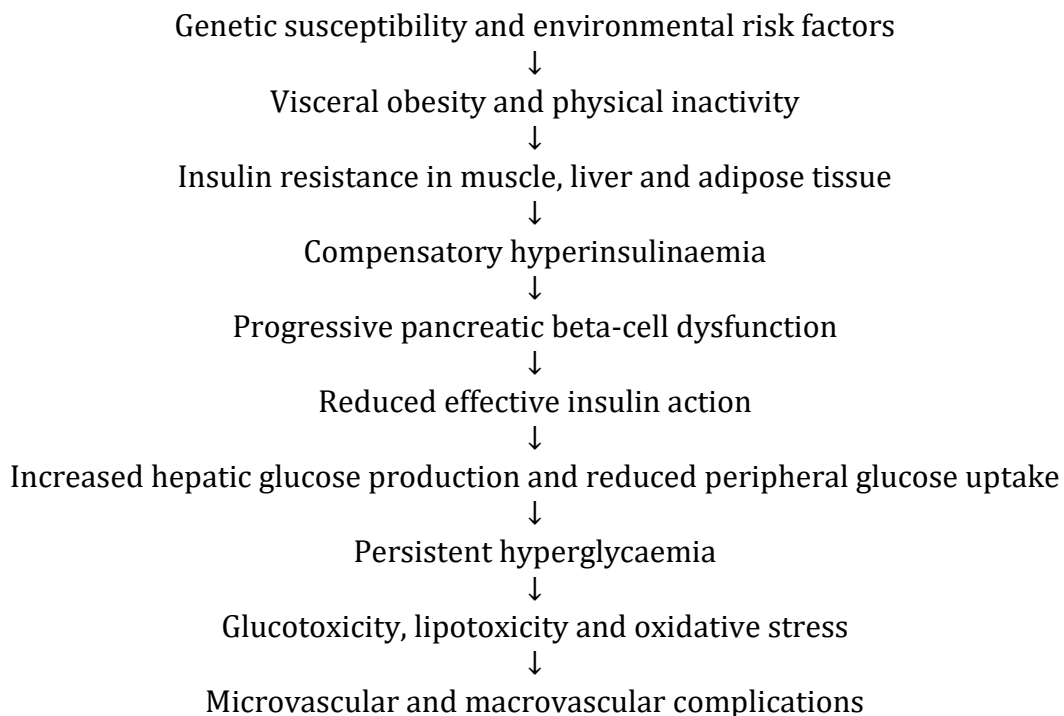
Definition

Type 2 diabetes mellitus is a heterogeneous metabolic disorder characterized by chronic hyperglycaemia resulting from insulin resistance and progressive loss of adequate insulin secretion. It commonly develops in adults but is increasingly diagnosed in younger individuals. Obesity, physical inactivity, unhealthy diet, ageing, family history, previous gestational diabetes, polycystic ovary syndrome and certain ethnic backgrounds increase the risk.¹¹

Pathophysiology

Insulin resistance develops when skeletal muscle, adipose tissue and the liver do not respond adequately to circulating insulin. The pancreas initially compensates by increasing insulin secretion. Over time, pancreatic beta cells lose their ability to meet the increased demand, causing persistent hyperglycaemia. Increased hepatic glucose production, impaired incretin response, abnormal glucagon secretion, increased renal glucose reabsorption and altered adipose tissue metabolism further contribute to disease progression.

Pathogenesis Flow Chart



Clinical Features

Type 2 diabetes may remain asymptomatic for several years. Symptomatic patients may present with polyuria, polydipsia, polyphagia, fatigue, blurred vision, recurrent infections, delayed wound healing, unexplained weight loss, numbness or burning of the feet and sexual dysfunction. Some patients are diagnosed only after developing retinopathy, neuropathy, kidney disease, cardiovascular disease or a serious infection.

Diagnostic Criteria

According to current standards, diabetes may be diagnosed by any one of the following criteria. In the absence of unequivocal hyperglycaemia or a hyperglycaemic crisis, an abnormal result should generally be confirmed by repeat testing.¹²

Test	Diagnostic value for diabetes
Fasting plasma glucose	≥126 mg/dL (7.0 mmol/L)
Two-hour plasma glucose during 75-g oral glucose tolerance test	≥200 mg/dL (11.1 mmol/L)
HbA1c	≥6.5%
Random plasma glucose with classic symptoms or hyperglycaemic crisis	≥200 mg/dL (11.1 mmol/L)

Complications

Chronic hyperglycaemia damages blood vessels and nerves. Microvascular complications include diabetic retinopathy, nephropathy and peripheral or autonomic neuropathy. Macrovascular complications include coronary artery disease, cerebrovascular disease and peripheral arterial disease. Patients also have an increased risk of infections, diabetic foot ulcers, non-alcoholic fatty liver disease, cognitive decline, periodontal disease and sexual dysfunction.

Principles of Modern Management

Management includes structured education, individualized nutritional therapy, regular physical activity, weight management, smoking cessation, adequate sleep, psychosocial support and pharmacological treatment. Metformin, sodium-glucose cotransporter-2 inhibitors, glucagon-like peptide-1 receptor agonists, dipeptidyl peptidase-4 inhibitors, sulfonylureas, thiazolidinediones and insulin are selected according to glycaemic status, comorbidities,

affordability and risk of adverse effects. Cardiovascular and kidney protection, rather than glucose reduction alone, is now a major part of treatment planning.¹³

Conceptual Correlation between *Madhumeha* and Type 2 Diabetes Mellitus

Ayurvedic concept	Possible correlation modern	Interpretive limitation
<i>Prabhuta Mutrata</i>	Polyuria	Polyuria has several possible causes
<i>Avila Mutrata</i>	Abnormal urinary constituents	Not a specific biochemical diagnosis
<i>Madhura Mutrata</i>	Glycosuria	Glycosuria depends on the renal threshold
<i>Avyayama</i>	Physical inactivity	Comparable behavioural risk factor
<i>Sthaulya</i> and increased <i>Meda</i>	Obesity and visceral adiposity	<i>Meda</i> has a broader Ayurvedic meaning
<i>Agni Mandya</i>	Impaired metabolic regulation	<i>Agni</i> is not equivalent to a single enzyme or hormone
<i>Kleda Vriddhi</i>	Fluid and metabolic imbalance	No exact biomedical equivalent
<i>Srotorodha</i>	Impaired transport and insulin resistance	Conceptual rather than literal correlation
<i>Avarana</i> of <i>Vata</i>	Functional obstruction due to excess tissue	Not identical to receptor-level insulin resistance
<i>Ojas Kshaya</i>	Reduced vitality and tissue vulnerability	<i>Ojas</i> has no direct laboratory marker
<i>Kara-Pada Suptata</i>	Peripheral neuropathic symptoms	Requires neurological evaluation
<i>Prameha Pidaka</i>	Recurrent infections or diabetic ulcers	Not every skin lesion is diabetes-related
<i>Sahaja Prameha</i>	Genetic and familial susceptibility	Genetic inheritance is more specifically defined biomedically
<i>Pathya Ahara</i> and <i>Vyayama</i>	Medical nutrition therapy and exercise	Both require individualization

Results and Findings

- *Madhumeha* is a chronic systemic metabolic disorder and not merely a urinary disease.

- *Kapha* predominance, increased *Meda*, abnormal *Kleda* and impaired *Agni* commonly initiate the disease process.
- Advanced disease involves aggravation of *Vata*, loss of *Ojas* and progressive *Dhatu Kshaya*.
- The two major presentations, *Avaranajanya* and *Dhatukshayajanya Madhumeha*, indicate that obese and lean patients require different therapeutic approaches.
- Excessive sweet and fatty food, sedentary behaviour, daytime sleep and obesity are important Ayurvedic causes that resemble recognized risk factors for type 2 diabetes mellitus.
- *Prabhuta Mutrata*, excessive thirst, hunger, weakness, burning sensation, numbness and delayed wound healing show clinical similarity to manifestations of diabetes.
- The Ayurvedic concept of *Sahaja Prameha* recognizes hereditary susceptibility, which is relevant to the familial tendency of type 2 diabetes.
- The progression from excessive nourishment and tissue accumulation to weakness and tissue depletion resembles the transition from insulin resistance to progressive beta-cell failure and catabolic manifestations.
- *Prameha Pidaka* may be conceptually related to recurrent infections, abscesses and diabetic ulcers, but direct equivalence should not be assumed.
- Both systems emphasize early diagnosis, dietary correction, regular physical activity, weight management and prevention of complications.
- Ayurvedic assessment is individualized through *Prakriti*, *Dosha*, *Dushya*, *Agni*, *Bala*, *Srotas* and disease stage.
- Modern diagnosis requires objective biochemical confirmation by plasma glucose or HbA1c testing.
- *Madhumeha* and type 2 diabetes mellitus overlap substantially but cannot be considered completely identical disease entities.
- Ayurvedic therapy should complement appropriate diabetes monitoring and evidence-based medical care rather than replace essential treatment.

Discussion

The present review indicates that classical descriptions of *Madhumeha* provide a broad account of metabolic dysfunction involving diet, behaviour, body composition, tissue metabolism and

urinary changes. The sequence beginning with excessive *Kapha*, *Meda* and *Kleda*, followed by obstruction of *Vata* and eventual tissue depletion, demonstrates a progressive model of disease. This framework is particularly useful because it distinguishes an overnourished, obese presentation from a lean and depleted presentation. Such differentiation supports individualized decisions regarding *Langhana*, *Shodhana*, exercise, nourishment and restorative treatment.¹⁴

Type 2 diabetes mellitus is similarly heterogeneous. Some patients have severe insulin resistance with central obesity, while others develop marked beta-cell failure despite having a lower body mass index. The conceptual similarity between *Avaranajanya Madhumeha* and an insulin-resistant obese phenotype is notable, while *Dhatukshayajanya Madhumeha* may resemble advanced disease with weight loss and diminished metabolic reserve. These comparisons remain interpretive because *Avarana*, *Agni*, *Meda*, *Kleda* and *Ojas* are complete Ayurvedic concepts and should not be reduced to insulin resistance, adipose tissue, body fluid or immunity alone.¹⁵

The strongest common ground between Ayurveda and modern diabetes care is prevention and lifestyle management. Regulation of food quantity and quality, regular exercise, reduction of sedentary behaviour, appropriate weight management and early identification of complications are fundamental in both approaches. Ayurveda adds individualized assessment of *Prakriti*, *Agni*, *Dosha*, tissue condition and patient strength, while modern medicine contributes standardized biochemical diagnosis, glucose monitoring and evidence-based cardiovascular and kidney protection. A coordinated approach may be clinically valuable when treatments are supervised, herb-drug interactions are considered and necessary glucose-lowering therapy is not delayed.¹⁶

Conclusion

Madhumeha is a chronic and progressive metabolic disorder involving *Dosha*, *Dushya*, *Agni*, *Srotas*, *Kleda*, *Meda* and *Ojas*. It shares several etiological, clinical and pathogenic characteristics with type 2 diabetes mellitus, particularly sedentary behaviour, excessive nutrition, obesity, polyuria, thirst, weakness and long-term systemic complications. Nevertheless, the two conditions belong to different diagnostic frameworks and should not be regarded as exact equivalents. Early identification, *Nidana Parivarjana*, individualized diet, regular physical activity, weight control, metabolic correction, biochemical monitoring and prevention of complications form a rational basis for comprehensive management.

Conflict of Interest -Nil.

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