MADHUMEH IN CONVENTIONAL PARLANCE

1 Kundu Suman, 2Tripathi Joydip
1Assistant Professor,Dept. of Kayachikitsa,Raghunath Ayurved Mahavidyalaya & Hospital,Contai, Purba Medinipur, West Bengal, India
2Assistant Professor,Dept. of Kaumarbhrittya,Raghunath Ayurved Mahavidyalaya & Hospital,Contai, Purba Medinipur, West Bengal, India

ABSTRACT

Ayurveda is one of the very popular and most ancient system of medicine in India as well as all over the world. Literally the meaning of the word Ayurveda is the science of life. Ayurved system of medicine not only deals with diseases but also equivalently deals with preventive aspect of health. Madhumeha is a disease known to mankind since vedic period. In ancient text compiled by Acharya Charaka, Acharya Sushruta, Acharya Vagbhata and many others, we get detailed description about this disease under the heading of Premeha. The major clinical features of Madhumeha correlates with the earlier notion of Diabetes Mellitus. In upcoming days, Diabetes Mellitus are going to be a burden for human kind. A vigorous searching is going on all over the world to get a potential solution. Hence a comprehensive understanding of Madhumeha in conventional parlance may explore the potential field to find out a solution for Diabetes Mellitus from Ayurveda.

Keywords: Madhumeha, Diabetes Mellitus

INTRODUCTION: Madhumeha is a disease known to mankind since vedic period. According to Indian mythology, Lord Gajanana was suffering from this disease because of his dietary and working habits. After the attack of the disease, he started to consume Kapittha, Jambu Phala and Shiva Gutika, on the advice of his father Lord Shiva. In ancient text compiled by Acharya Charaka, Acharya Sushruta, Acharya Vagbhata and many others, we get detailed description about this disease. Madhumeha has been described in ayurvedic compendia either separately or under the heading of Premeha. Premeha is a disease associated with altered urine synthesis mechanism and is characterized in terms of avila-prabhuva-mutra (excessive and contaminated urination). Among 20 types of Premeha, Madhumeha is concern with ojo kshaya.

A similar disease was recognized as early as 1500 B.C by Egyptian physicians, who described a disease associated with “the passage of much urine”. The word diabetes, was first used for such type of disease by Arteues of Cappadocia in the 2nd century AD. Artaeus noticed that patients with diabetes had a disease that caused the siphoning of the structural components of the body into the urine. A British Surgeon-General named John Rollo in 1798 coined the term mellitus – a Greek word for honey. It was known for centuries that the urine of patients with diabetes mellitus was sweet.

AIM AND OBJECTIVE : A numbers of drastic efforts are being performed for last few decades to find out a suitable remedy for Diabetes Mellitus (DM) with Ayurvedic drugs. In Ayurveda, samprapti or pathogenesis of a disease plays a key role behind the selection of any drug. Hence before such an evaluation of a drug it is essential to explore the concern disease along with its samprapti in conventional parlance or vice-versa. This review aims at providing the conventional scientific rationale behind the concept of Madhumeha.

The objective of this study are -
- To evaluate the concept of Madhumeha in Ayurvedic literatures
- To explore the concept of Madhumeha with conventional parlance

MATERIALS AND METHODS:

Data obtained from various medical text book, classical Ayurvedic compendia, published scientific papers has been collected, analyzed and presented in
regard to concern topic. PubMed, Scopus and Google Scholar databases were searched for studies.

CRITICAL ANALYSIS

Vyutpatti (Etymology)

Madhumeha is composed of two words i.e madhu and meha.

- Madhu – refers to honey, sweet, delicious
- Meha – refers to excessive flow of urine

The vyutpatti gets concised and specific, that the disease in which the excretion is having quality concordant with madhu is called Madhumeha.

Clinical Presentation

According to Acharya Vagbhata “Madhumehi madhu sama jayate”.

The urine of a Madhumeha patients has a resemble with honey.

Madhumeha have been characterized in term of both urinary as well as systemic features by Acharya Yogaratnakar:

1. Madhuram taccha mehashu (Sweetness of urine)
2. Madhur -yaccha tanorata (Sweetness of whole body)

Classification of Madhumeha in Samhita

The etio-pathologically Prameha has been classified by susruth into two distinct types

a) Sahaja (Hereditary) – Sahaja prameha occurs as a result of beeja dosha i.e. genetic origin
b) Apathyanimittaja (Acquired)- Apthyanimittaja type itself suggests its etiology. It occurs due to both Ahitahara-vihara.

So analyzing this classification of Prameha, Madhumeha also may be classified into above two group based on etiopathogenesis. Although there is no such direct classification of Madhumeha in Ayurvedic classics, Acharya Charaka has mentioned two entity of Madhumeha in Charak Samhita

1) Asadhya Madhumeha - Sahaja Madhumeha are asadhya or incurable in nature.
2) Kriccha Madhumeha – Madhumeha associated with acquired etiologies of kapka-pitta prokapa are kricchasadhya or difficult to cure.

Nidana (Etiologies)

Nidana of Madhumeha can be categorized into:

- Bija dosha (Hereditary)
- Apaththa nimittaja (Due to improper diet and physical activity)

Acharya Charak only explains specific acquired etiologies for Kricchasadhya Madhumeha. They are:

- Aharaja (Dietary): Excessive intake of guru, snigdha, amla, lavan dravya.
- Vihara (Physical activity) : Nidra & asya sukha (Sedentary lifestyle).

Asadhya Madhumeha associated with acquired etiologies that result in vataprokapa, such as –

- Aharara (Dietary) : Excessive indulgence to kasaya-katu-tikta-ruksha-laghu-sita dravy, anashana (least fed state)
- Vihara (Physical activity) : Vyayam (Excessive physical work), vyavaya (Coitus), jagaran (Sleep deprivation) etc

Samprapti (Pathogenesis)

The samprapti of madhumeha includes two important pathological phenomena

- Dhatukshaya
- Avarana

In Mahumeha, dhatuksha initially refers to ojo kshaya. Ojo kshaya is the characteristic pathological phenomenon in Madhumeha. Ojo has been defined as the ultimate product of dhatuposhana which is associated with param teja or energy.

The general function of ojo are

- Vartayanti – It helps to carry out various functions which are essential to continue life
- Prinitwa – It helps to synthesis the essential physiological components
**Ojokshaya** may occurs in **Madhumeha** either directly due to vataprokapa or via obstruction in the gati of vayu. Increased kshaya and ruksha guna of vayu caused by vata provocative ahara-vihara may leads to excretion of ojo through urine. This type of pathological phenomenon is considered as incurable by Acharya Charaka.\(^{17}\)

**Avarana** is another factor, which may results in excretion of ojo through urine. Guru snigdhadi ahara, avayamadi vihara etc, leads to vitiation of kapha - pitta dosha and involves meda and mamsa dhatu. All these factors obstruct the gati of vata leading to altered physiological state of vata. Vitiated vata thereafter withdraws oja from the body and takes it towards basti and leads to Madhumeha, which is krichrasadya for treatment. The vata, pitta and kapha doshas start manifesting their symptoms intermittently depending on their extent of dushti.\(^{18}\)

**DISCUSSION:**

**Concept of Madhumeha vis-à-vis Diabetes Mellitus**

**Madhumeha** is the diseases mentioned in ancient Indian medical literature based on an unique character of urine that is honey like urine. In western medical history first the word “Diabetes” was introduced to describe a diseases associated with copious urine. The term “mellitus” (Latin, sweet like honey’) was coined by the British Surgeon-General, John Rollo in 1798 to specify a type of diabetes from others in which the urine was tasteless (e.g. diabetes insipidus). In 1921, Banting, Best and Collip established that the deficiency of insulin was the cause of diabetes mellitus. When screening programs for diabetes mellitus commenced in the 20th century, it became apparent that there were many people who could be classified as having diabetes mellitus but who were in general “asymptomatic”.

Presently Diabetes Mellitus is defined as a group of metabolic diseases characterized by chronic elevation of blood glucose (hyperglycemia) that results from defect in insulin secretion, insulin action or both.\(^{18}\)

When fully expressed diabetes is characterized by fasting hyperglycemia.\(^{19}\)

**Concept of Ojokshaya in Madhumeha vis-à-vis Altered Cellular Fuel Metabolism in Diabetes Mellitus**

In Ayurveda, ojo is considered as param teja or energy. Ojo is the ultimate product of dhatuposhana. It is required to carry out various functions and synthesis. The concept of ojo synthesis have a fundamental similarity with effective cellular fuel metabolism. In this respect, ojokshaya may be consider as altered energy homeostasis.

Various fuels like glucose, fatty acid and glycerol, fatty acid are oxidized in cell via different catabolic pathways to generate adenosine triphosphate (ATP) which are energy-rich compounds and are able to supply energy for biochemical processes. Most of the energy required by cell is generated from lipids and carbohydrates. All metabolic processes in which gaseous oxygen is used to oxidize organic matter to carbon dioxide, water, and energy is known as cellular respiration. The Insulin is the pivotal hormone regulating cellular energy supply and macronutrient balance, directing anabolic processes of the fed state. Insulin is essential for the intra-cellular transport of glucose into insulin-dependent tissues such as muscle and adipose tissue. In muscle cells, glucose entry provide immediately available energy source for muscle contraction, glycogen to be synthesized and stored, inhibits fatty acids or amino acids to be utilized as the immediately available energy source. Insulin therefore promotes glycogen and lipid synthesis in muscle cells, while suppressing lipolysis and gluconeogenesis from muscle amino acids. In the presence of an adequate supply of amino acids, insulin is anabolic in muscle.\(^{20}\)

A defect in insulin secretion, insulin action or both therefore affects the energy homeostasis. The resultant metabolic derangement is accompanied by
abnormalities in carbohydrate, protein, and fat metabolism.\textsuperscript{21}

**Classification and Pathophysiology of Madhumeha vis-vis Diabetes Mellitus**

The *Sahaja Madhumeha* strongly corresponds to Type 1 Diabetes Mellitus (T1DM). The pathophysiologic mechanisms in T1DM involve loss of islet beta cell secretory function caused by selective killing of these cells primarily by aggressive autoimmune responses involving both cellular and humoral immune pathways. The complex etiology of T1DM involves a strong genetic predisposition, mainly human leukocyte antigen class II genes, and several putative environmental factors, which are thought to trigger autoimmunity or progression to clinical T1DM.\textsuperscript{22}

The concept of *Apthyanimittaja Madhumeha* may be correlated with Type 2 Diabetes Mellitus (T2DM). T2DM develops because of a coupling of two events\textsuperscript{23}

- Acquired insulin resistance
- Progressive deterioration in $\beta$ - cell function

They are responsible for defect in insulin action and secretion respectively. T2DM may ranging from predominantly insulin resistance with relative insulin deficiency to predominantly an insulin secretory defect with insulin resistance.\textsuperscript{24} Most patients with this form of diabetes are obese, and obesity itself causes some degree of insulin resistance although T2DM can affect non obese individual also. Insulin resistance may improve with weight reduction. Metformin is the 'drug-of-first-choice' in obese patients with type 2 diabetes mellitus. In non-obese patients with T2DM, insulin secretagogues are empirically used as first choice.

Lean T2DM variant has been introduced recently associated with non obese individuals as well as earlier and more prevalent use of insulin. In the obese individual, the diabetes develops once the beta cell cannot compensate with the insulin resistance conferred by the growing obesity. In the lean T2DM variant, the early failure of the beta cells results in development of diabetes at much lower insulin resistance. Studies in developing countries have shown that these patients have history of childhood malnutrition, poor socioeconomic status.\textsuperscript{25}

T2DM in obese subject have a fundamental similarity with *avarana jannyo madhumeha* in which vitiation of *meda* plays a key role, whereas lean T2DM variant is close to *Madhumeha* caused by *vata prokapaka ahar vihar*.

**CONCLUSION**

The disease *Madhumeda* bear a resemblance to Diabetes Mellitus in
respect to clinical presentation, etiological and patho-physiological aspects. Prognosis of Madhumeha has been well described in Ayurvedic literatures. Madhumeha associated with sedentary lifestyle and obesogenic diet have a similar appearance to T2DM having predominantly insulin resistance. Such type of Madhumeha is considered as treatable but difficult to cure. Incurable types of Madhumeha, conventionally correlates with Diabetes Mellitus associated with insulin secretory defect predominantly.

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Corresponding Author:
Dr. Suman Kundu, Assistant Professor,Dept. of Kayachikitsa, Raghunath Ayurved Mahavidyalaya & Hospital, Contai, Purba Medinipur, West Bengal, India
Email: drsumankundu1@gmail.com

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