

Madhumeha W.S.R To Type 2 Diabetes Mellitus

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Abstract

India is the capital of Diabetes Mellitus accounting for 1 in 6 (17%) of all cases of diabetes worldwide. Now-a-days, lack of sufficient physical activity and sedentary lifestyles are the main risk factors for Diabetes Mellitus. Diabetes Mellitus is a metabolic disorder characterized by the persistence of hyperglycemia due to defects in insulin secretion and abnormal insulin function. Prameha, a disease described in Ayurveda in the letter stage develops into Madhumeha and may be correlated with Diabetes Mellitus. **Material and Methods:** In order to focus on the disease status, the etiological factors, clinical features, Pathophysiology, Pathogenesis, Diagnosis of disease, and preventive measures described in various contexts and the views of researchers are taken into consideration as methods of the review. **Discussion and conclusion:** Ayurveda strongly believes in the importance of preventive, promotive, and curative aspects to maintain health status. Preventive health can be achieved by the principles of Dinacharya, Ritucharya, Sadvritta and Achara Rasayan, Hita ahara, and Virudha ahara mentioned in Ayurveda, Health promotion enables individuals, families, populations, and communities to adopt lifestyles that promote and improve health. But now a days people follow sedentary lifestyles rather than this. Due to lack of sufficient physical activity several lifestyle disorders arise, Madhumeha is one of them. It is a subtype of Prameha Characterized by passing of urine like Madhu (Honey). It may be co-related with type 2 Diabetes Mellitus. Polyurea, Polydipsia & Polyphagia are the symptoms of DM. There are a lot of complications of the disease from acute metabolic complications to Systemic. But it can be prevented & managed by following the Principles of Ayurveda.

Keywords

Ayurveda, Diabetes Mellitus, Madhumeha

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1. Introduction

Madhumeha: There are 20 types of *Prameha* described in *Ayurveda*, if left untreated it leads to *Madhumeha* ^[1]. It is a type of *Prameha*, in this disease the patient void urine similar to honey either in its color, taste, smell or appearance ^[2]. It is of two types, one due to *dhatukhaya*, another one is due to *avarana*. In both types, *Vata* gets aggravated.

Diabetes Mellitus is a group of metabolic disorders sharing the common features of chronic hyperglycemia with disturbances of carbohydrate, fat, and protein metabolism. ^[3] Hyperglycemia in diabetes results from defects in insulin secretion and abnormal insulin function or most commonly both.

Two types of DM are an Autoimmune disease characterized by pancreatic B cell destruction and absolute deficiency of insulin is known as Type I and is a combination of peripheral resistance to insulin action and inadequate secretory response by the pancreatic B cells. (Relative insulin deficiency) is known as Type II.

Other different forms of diabetes are Genetic malfunctions in beta cell activity, Insulin action deficiency caused by genetics, Pancreatic exocrine diseases, Endocrinopathies, Due to infectious diseases, extremely rare immunological diseases, and the genetic syndrome linked to diabetes.

2. History of Diabetes Mellitus

Diabetes mellitus is derived from the Latin term mellitus, which means honeyed or sweet, and the Greek word diabetes, which means syphon - to pass through. Probably around 250 BC, Apollonius of Memphis coined the name "diabetes." The term "diabetes" first appears in an English medical text published about 1452. In order to describe urine that was sweet, Thomas Willis coined the term "mellitus" to describe diabetes in 1675. The first people to notice that a patient's urine and blood tasted sweet when they had *Madhumeha* compared with DM were our *Ayurveda* Acharyas ^[4].

3. Prevalance in India

After China, India is the country with the second highest prevalence of diabetes, estimated to impact 77 million people (1 in 11 Indians). In addition, 700,000 Indians passed away in 2020 from diabetes-related complications such as hyperglycemia, kidney disease, or other conditions. India accounts for 1 in 6 (17%) of all cases of diabetes worldwide (As of October 2018, India's population accounted for around 17.5% of the world's population). The International Diabetes Federation predicts that by 2045, there will be 134 million people worldwide suffer from Diabetes ^[5].

4. Nidana (Etiology)

Indulgence in a sedentary lifestyle by avoiding physical activity, excess intake of sleep, curd, meat, milk products, and all other *Kapha Vardhaka Ahara* and *Vihara*. ^[6]

Causes of Type II Diabetes

Type II diabetes is caused by a combination of factors, including insulin resistance, a condition in which the body's muscle, fat, and liver cells do not use insulin effectively. It develops most often in middle-aged and older people who are also overweight and obese children and adolescents. Symptoms of type II diabetes may develop gradually and may remain undiagnosed for years [7].

- a) **Genetic Susceptibility:** Studies have shown that variants of the TCF7L2 gene increase susceptibility to type 2 diabetes. Also, genes can increase the risk of diabetes by increasing a person's tendency to become overweight or obese and tendency to store energy.
 - i. There is approximately 80% chance of developing diabetes in the other identical twin if one twin has the disease.
 - ii. A person with one parent having type 2 DM is at an increased risk of getting diabetes, but if both parents have type 2 DM the risk in the offspring rises to 40%.
- b) **Environmental Factors:** Central obesity, less physical activity in which a person has excess abdominal fat, is a major risk factor for insulin resistance.
- c) **Insulin Resistance:** Muscle, fat and liver cells stop responding properly to insulin, forcing the pancreas to compensate by producing extra insulin.
- d) **Abnormal Glucose Production by the Liver:** High glucagon levels for unknown reasons in diabetics cause the liver to produce excess glucose.

5. Pathophysiology

The main mechanism for hyperglycemia in type II diabetes mellitus – Insulin resistance and impaired insulin secretion. Which increases hepatic glucose synthesis and results in hyperglycemia. Chronic hyperglycemia leads to diabetes mellitus.

5.1 Problem In Cell Signaling and Regulation

The molecular signals that enable the cells to take glucose from the blood and use it for energy are triggered by interactions between circulating insulin and its receptor molecules on the cell surface. A signaling issue can start a domino effect that eventually results in diabetes. Researchers have mapped interactions between insulin and bodily tissues and have discovered the proteins and pathways that convey insulin. It was also shown that important signals originate from fat cells, which secrete inflammatory and insulin-resistant molecules. The research holds the key to battling diabetes and insulin resistance.

5.2 Beta Cell Dysfunction

Insulin release patterns that are insufficient or abnormal can result from beta cell dysfunction. Additionally, high blood glucose levels can harm beta cells, a phenomenon known as glucotoxicity. Beta cell dysfunction is increasingly believed to be a major cause of type 2 diabetes, the most common cause is beta cell malfunction. Theoretical hypothesis: genetic flaw, A subsequent tendency to diabetes may also be caused by the metabolic environment of the developing fetus.

6. Samprati

6.1 Dhatukhaya Janya

Vayu gets aggravated due to *DhatuKshaya*, *Vayu* carries the *Ojas* to *Basti*, lodgement of dosha in *Basti*, excretion of excess urine & manifest of *Madhumeha*. *Vata* Provocation is caused by the *Kshaya* of *Gambhira* and *Sarabhuta Dhatus* like *Vasa*, *Majja*, *Oja*, and *Lasika*. When *Sarabhuta Dhatus* are excreted through the urine, it happens in such a large quantity that this *Kshaya* again serves as *Nidana* for *Vata* Prakopa. The vicious cycle continues, but because of *Vata's* *Ashukaritva* quality, all of the phases of *Samprati* progress so quickly that the disease quickly reaches the *Asadhya* stage. ^[8]

6.2 Avarrana Janya

In this, *Vayu* gets aggravated due to obstruction of passage By *Kapha* & *Meda*. Other *Dhatus* also vitiated *Mamsa* & *Meda* dhatu, all Dhatu get shaithailya then aggravated *Vata* dosha pulls out *Ojas* from all the *Dhatus* and carries to *Basti* & manifest *Madhumeha*.

According to Acharya Charak excess intake of *Guru* (heavy), *Snigdha* (oily), *Amla* (Acidic), *Lavana* (Salty) Substances, *Naba Anna* (newly Harvested foods), *Naba jala*, excess sleep, comfortable resting for hours without doing any work and less physical activity and not doing internal purification of our body by *Vamana* and *Virechana*, these all can aggravate *Kapha*, *Pitta* which vitiates *Meda* and *Mamsa* dhatu then obstructs the route of *Vayu*. Then *Vayu* gets aggravated and takes *Ojas* to the *Mutrashaya*. Patients void urine resembles honey. Manifest *Madhumeha*. ^[9]

6.3 Samprativishishta Anilatmaka Madhumeha

This form of *Samprati* of *Vataja Prameha* happens in those who have *Tatwavidha Sharira*, a specific bodily tendency for *Prameha* onset.

These people possess the distinctive *Abadhhatva Meda Bahulyata*. It could result from a *Prakriti* manifestation, a hereditary tendency, or inactive lifestyle choices. *Vata* becomes vitiated in these people as a result of their over indulgence in *Aharaj* and *Viharaj* nidana bhavas. Further accusations are made against this tainted *Vata* by *Meda*. Consequently, either *Vasa*, *Majja*, *Lasika*, or *Oja* are transferred into the *Basti*, as a result of this disturbed *Vata-Meda* complex spreading throughout the body. When *Oja*, under the influence of *Vata*, transforms into *Kashaya* and *Ruksha* Guna and is eliminated through the urinary tract, the condition is referred to as *Madhumeha*. ^[10]

Sahaja Prameha is correlated with *Tatwavidha Sharira* (genetic predisposition). According to the Acharya Sushruta^[11], *Sahaja Prameha* precipitates as a result of a *Beeja Dosha* (defect). As a result of the *Beeja* (sperm/ovum) *Dosha* (defect), Charaka claims that *Sahaja Madhumeha* is a *Kulaja Vikara* ^[12].

6.4 Kala Prabhavaja Madhumeha

Sushruta and Vagbhata mention this kind of *Madhumeha*.^[13] Although the actual etiology is not specified, it is claimed that all forms of *Prameha* can turn into *Madhumeha* when they are disregarded or improperly treated. We may claim that this is the final stage, the point at which *Kaphaja* and *Pittaja Prameha* become more complicated, or the end of the disease's progression.^[14]

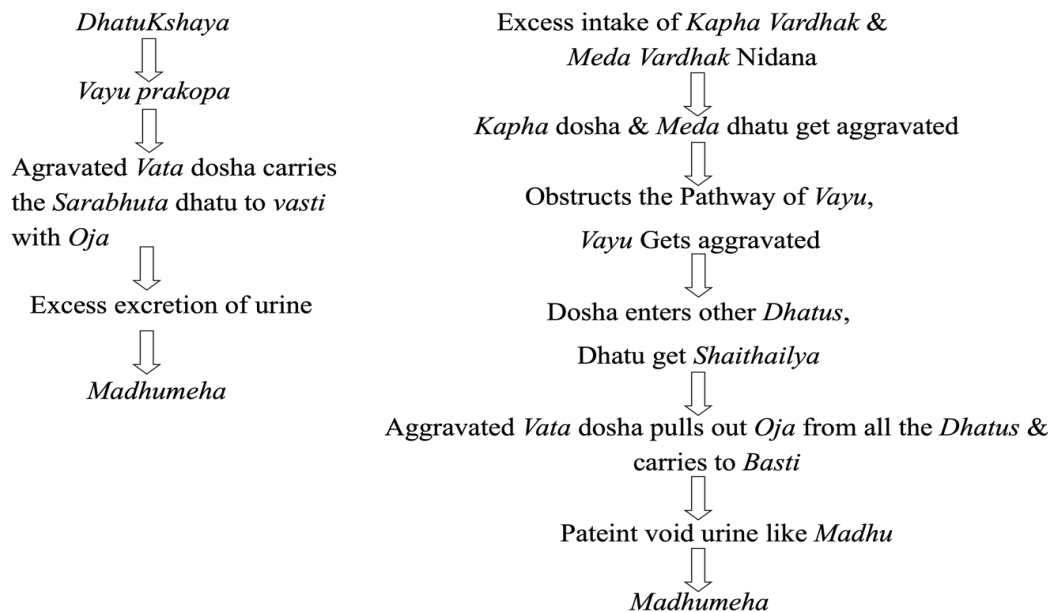


Figure 1. Etiological Factors of Madhumeha

7. Samprati Ghataka

DOSHA: Vata Pradhana Tridosha

DUSHYA: Tridosha, Rasa, Rakta, Mamsa, Meda, Majja, Shukra, Vasa, Lasika, Oja, Kleda.

SROTAS: Meda Vaha, Mutra Vaha

SROTADUSTI: Sanga, Atti Pravriti

ADHISTHANA: Vasti

AGNI: Mandya

VYADHISWAVABA: Chirakari

SADHYA-ASADHYA: Asadhya

8. Purvarupa (Prodromal Symptoms)

Hair becomes curly, Sweetness of mouth & body, Numbness & Burning sensation of limbs, excessive thirst, fatigue, heaviness of body, bad smell from body, mouth & urine, excessive growth hair & nail.^[15]

9. Roopa (Clinical Features)

Patients void urine similar to Honey either by taste, smell, or appearance.^[16]

*In *Madhumeha*, the Patient becomes lethargic, if you ask the patient to walk, he will stand, if you ask the patient to stand, he will sit, if you ask the patient to sit he will sleep^[17].

10. Symptoms of Diabetes Melitus

Polyurea, Polydipsia, Polyphagia, Burning feet, Weakness, Lethargy, Weight loss^[18].

11. Risk Factors

- First-degree relatives with type 2 DM
- Obesity

- Less physical activity
- History of gestational DM or delivery of baby heavier than 4kg
- Hypertension
- with PCOS [19]
- Dyslipidemia
- History of Cardiovascular disease
- Women

Less Physical activity, excess obesity, and excess intake of carbohydrate foods are more prone to *Madhumeha* [20].

12. Diagnosis

According to America Diabetes Association (ADA) & WHO, Diagnostic criteria for diabetes include [21]:

- A Fasting Plasma Glucose ≥ 126 mg/dl.
- A random Plasma Glucose ≥ 200 mg/dl.
- Post Prandial Plasma Glucose ≥ 200 mg/dl during an Oral Glucose Tolerance Test with a Loading dose of 75 gm.
- HbA1C – Glycated hemoglobin level $\geq 6.5\%$

13. Upadrava

Prameha Pidaka, Daha (burning sensation), *Trishna* (Thirst), *Atisara* (Loose motion), weakness, *Arochaka* (Anorexia), *Ajirna* (Indigestion), *Krishna* (emaciation), etc. [22].

14. Complication of Dm

- Acute metabolic complication: Diabetic ketoacidosis, hyperosmolar nonketotic coma & hypoglycemia.
- Late Systemic complications: Atherosclerosis, diabetic microangiopathy, diabetic nephropathy, diabetic neuropathy, diabetic retinopathy, and infections [23].

15. Prevention

Nidanaparivarjana avoiding of causative factors, regular exercise, proper dietary habits, avoid unhealthy junk foods, avoid smoking & Alcohol [24]. Initially, we can advise people to do some changes in lifestyle, weight losing exercises, Pranayam, Asana, Yoga and explain the benefit of *Dinacharya, Rutucharya, sadvritta, Astavidha Ahara Visheshayatan & Dwadasa Asana Vichara* which they can add to their life to prevent the lifestyle diseases like *Madhumeha* and for a good prognosis.

16. Discussion

Diabetes is a lifestyle disorder prevailing disease in the world wide due to our own creation can be prevented. *Ayurveda* strongly gives importance to the preventive and promotive aspect of health also Curative as well. So in this Paper, we have discussed about the History, Etiology with all the factor responsible for the disease mainly *Kapha & Meda Vardhak Ahara Vihara* plays an important role in nidana of the disease, detail *Samprati* (Pathogenesis), how the disease manifests from *dhatukhaya* and *Ava-rana*, Prevalence in India because India is the Capital of Diabetes, Symptoms, Risk factors like Obesity & sedentary lifestyle, Diagnosis, all the Complications from acute metabolic to systemic complications of *Madhumeha* vs type II Diabetes Mellitus. How we can prevent and manage *Madhumeha* by following *Ayurveda* Principles also discussed.

17. Conclusion

The subtype of *Prameha* known as *Madhumeha* falls under the category of *Vataja*, is characterized by additional symptoms as well as the passage of urine that resembles *Madhu* (honey). Similar to the symptoms of diabetes Mellitus. As a result of our



inability to resist the urge to party, live in a sedentary environment, have irregular sleeping patterns, consume junk food, and engage in little physical activity, we have created metabolic illnesses that are tied to our way of life. The only cure is to learn to manage our senses and live in peace with nature by abstaining from the toxic foods and lifestyles that are the root of the problem. By adopting *Pathya Ahara vihara*, and *sadvritta Palana* we can prevent diabetes and its complications.

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