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## CRITICAL ANALYSIS OF AYURVEDIC TREATMENT MODALITIES IN THE MANAGEMENT OF DIABETES MELLITUS (MADHUMEHA)

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### ABSTRACT

Diabetes is one of the foremost common non-communicable diseases globally. The prevalence of the disease is increasing more rapidly across the world due to unhealthy diets and lifestyle habits as well as inadequate health care services. Since people with diabetes often use complementary and alternative medications including Ayurvedic medications along with modern medicine to maintain a healthy and happy socio-psychological well-being and hence it is important and necessary to draw on the knowledge of all medical systems available globally. So, the present article is attempted to highlight the medical measures described in Ayurveda in the prevention and management of Diabetes mellitus (Madhumeha).

**Keywords: Diabetes mellitus, Prameha, Madhumeha, Ayurveda, Management**

### INTRODUCTION:

Diabetes mellitus, commonly known as diabetes, is one of the most common non-communicable diseases (NCDs) globally. Its prevalence is predicted to double globally from 171 million in 2000 to 366 million in 2030 with a maximum increase in India to an extent that by 2030. Diabetes mellitus may afflict

up to 79.4 million individuals in India [1]. Currently, the prevalence of the disease is increasing more rapidly with age across the globe due to unhealthy diets and lifestyle habits as well as inadequate health care services. Recent research into treatments for diabetes has resulted in several FDA-approved molecules that target diabetes. Since diabetes is a polygenic condition, researchers are attempting to develop genome-based treatments, based on the particular genetic composition of an individual with diabetes rather than treatments designed for most persons with diabetes, regardless of their genetic makeup. Clinicians are also researching changes in diet and lifestyle activities that could help to maintain blood pressure and healthy blood sugar levels in persons with diabetes as well as to reduce their symptoms of diabetes [2]. Hence, it has become a global public health problem that requires regular medication along with lifestyle modification to achieve adequate control.

People with diabetes often use complementary and alternative medications (CAM) including Ayurvedic medications [3, 4] to maintain a healthy and happy socio-psychological well-being. The use of CAM for patients with diabetes was reported to be common in almost all parts of the world [5, 6]. China had a long

tradition of the use of herbal medicine for diabetes. The findings of a systematic review reported that Chinese herbal medicines were reported to be more effective for diabetes compared with lifestyle modification alone [7].

A few studies reported CAM use in different parts of India. One such study from the state of Uttar Pradesh reported a prevalence of 68% CAM use among diabetes patients [8]. CAM use for selected chronic diseases (HIV, epilepsy, rheumatoid arthritis and diabetes) in India was reported to be 35% with the highest use of CAM among diabetes patients (63.2%) in Maharashtra [9]. India has a rich tradition of use of Ayurvedic medicines. It has a Government department for CAM which is named 'AYUSH' (Ayurveda, Yoga, Naturopathy, Unani, Siddha and Homeopathy).

Hence it is important and necessary to draw on the knowledge of all medical systems available globally. New medications with different mechanisms of action or with novel approaches to therapy are needed to improve patient outcomes and reduce the clinical burden of this condition. So, the present article is attempted to highlight the medical measures described in Ayurveda in the prevention and management of Diabetes mellitus (*Madhumeha*).

**OBJECTIVES:**

The specific objective of the present literary study is to highlight the medical measures described in Ayurveda to manage Diabetes mellitus (*Madhumeha*).

**METHODOLOGY:**

The classical textbooks of Ayurveda such as *Charaka Samhitā*, *Sushruta Samhitā*, *Ashtānga Hridaya* etc., concern commentaries and the information on Diabetes mellitus (*Prameha/Madhumeha*) from the available sources have been referred thoroughly. The findings related to the objectives of the study have been collected, compiled and arranged as a review article.

**DIABETES MELLITUS IN AYURVEDA:**

In Ayurveda, the syndrome of diabetes mellitus is largely covered under the broad heading of *Madhumeha*, a subtype of *Vātaja Prameha*. The term *Prameha* consists of two words. *Pra* (*upsarga*-prefix) means abundant and *Meha* is derived from the root *Miha Sechane* meaning watering and is applied to mean the passing of urine. Therefore the word *Prameha* means passing of urine abundantly both in quantity and frequency. In all *Prameha* the *Tridoshas* (three humours viz., *Vāta*, *Pitta* and *Kapha*) are invariably involved, hence while explaining *Sankhyā Samprāpti* of *Prameha* it is said that there are twenty types of *Prameha*

diseases are produced out of which ten are *Kaphaja*, six are *Pittaja* and four are *Vātaja Prameha* which cause abnormalities in urine. The cardinal symptoms of *Prameha* are described as “*Prabhutāvila Mutratā* (excessive and turbid urine) [10-12]. *Prameha* (Diabetes) is also considered a *Maharoga* (major disease) because it affects most of the body parts and every cell of the human physiology [13]. All types of *Prameha*, if not properly treated or neglected for the long term may ultimately get converted into *Madhumeha* and the disease *Prameha* with *Pidaka* should be termed as *Madhumeha* which is the terminal stage of urinary disorders [14].

The term *Madhumeha* has two parts. *Madhu* means honeyed or sweet and *Meha* means the passing urine. *Madhumeha* reflects the sweet smell and taste of the urine. Hence *Madhumeha* and Diabetes mellitus are analogous and refer to sugar in the urine i.e., excess sugar is found in the blood as well as the urine. The clinical conditions described in diabetes mellitus have much in common with that described for *Madhumeha* in which the patient passes excessive amounts of (voids) *Kashāya* (astringent taste), *Madhura* (sweet taste), *Pāndu* (pale colour) *Ruksha* (dry texture) urine having concordance with *Madhu* (honey) and thus body attains sweetness [15, 16]. *Ojomeha* [17], *Kshaudrameha*

[18] and *Paushpameha* are mentioned few synonyms for *Madhumeha*.

Ayurvedic science described the symptoms that are suggesting the prodromal stage of *Prameha* that can be taken as an early warning sign of diabetes. They are – *Swedoanga gandha* (more sweating and bad smell of the body), *Galatālusosha* (dryness in throat and palate), *Mādhuryamāsyasya* (sweetness in mouth), *Karapādādāha* (burning sensation of the palms and soles) and so on. The Specific *Lakshana* of *Madhumeha* has been described as “*Mutre abhidhāvanti pipilikāshcha* [19] (glycosuria may be detected by the swarming of ants towards urine). The level of sugar in the blood rises above the normal levels and sugar may also be detected in urine. In comparison to modern medicine, Diabetes Mellitus is a leading disease, which shows abnormalities in the urine (*Prameha*) and causes renal damage if not properly treated or neglected.

Vagbhata has mentioned *Madhumeha* arises in two ways viz, *Dhātukshyajanya* (depletion of *Dhatus* or tissues in the body ) and *Āvaranjanya* (blockage of paths or channels in the body). *Dhātukshyajanya* pathology occurs due to the depletion of *Dhātus* (tissues) by *Vāta* while *Āvaranjanya* pathology occurs due to obstruction of its path by the doshas covering it [20].

***Pramehi Nivrutti Laksana:*** When the urine of a diabetic patient (*Pramehi*) becomes *Apicchilam* (non-slimy), *Anavilam* (non-turbid), *Vishadam* (viscid), *Tiktakatukam* (bitter or pungent in taste), then the patient is considered as healthy (cured by diabetes) [21].

#### AYURVEDIC MANAGEMENT OF DIABETES MELLITUS:

Ayurveda aims to keep the structural and physiological entities in a state of equilibrium, which signifies good health. It treats diseases with a multi-pronged approach, by restoring the equilibrium through various regimens, Panchkarma procedures, diet and medicines.

***Chikitsā Sutra*** (Principles of treatment):

In all types of *Pramehas*, *Kapha* gets vitiated, but in *Madhumeha* comparatively, *Vāta* is often aggravated as well. Therefore, therapies will be directed at both *Kapha* and *Vāta* simultaneously. Charaka states that one should adopt *Brihmana Chikitsā* (Nourishing therapy) for *Krishna Pramehi* (Lean Diabetic) while *Samsodhana Chikitsā* (bio-purification therapy) for *Sthula Pramehi* (Obese Diabetic) based on the *dosha* dominance [22]. After *Shodhana Chikitsā*, *Shamana Chikitsā* is to be followed. Acharya Sushruta also says that *Sahaja Meha Rogi* will be *Krishna Pramehi* and should be

treated with *Santarpana* measures (tissue rejuvenation) processed diet and drink, while *Apathyanimitaja Rogi* will be *Sthula Pramehi* and should be treated with *Apatarpana* measures such as *Langhana* (*Vyāyāma*/ exercise) and *Shodhana* (bio-purification therapy) [23]. Vagbhata further opines that *Krishna Pramehi* should be given nourishing drugs and diet [24]. The disease is also controlled by wholesome diets and lifestyle habits. This is the general principle of treatment in *Prameha* and the same principle applies to *Madhumeha*.

Although *Madhumeha* is described as incurable it can be managed through a holistic and comprehensive approach. Its treatment can be discussed under the following headings:

1. *Nidāna Parivarjana* (avoid the cause)
2. *Shodhana* (bio-purification therapy)
3. *Shamana* (palliative therapy)
4. *Rasāyana* (rejuvenation treatment)
5. *Pathya* (diet therapy)
6. Yogic therapy

#### 1. NIDĀNA PARIVARJANA

(Avoidance of etiological factors): Avoidance of etiological factors has been given prime importance behind the success of many treatments in Āyurveda. The basic principle “Prevention is better than cure” is the first step in the management of Diabetes mellitus. Avoid the below-

listed aetiological factors of *Prameha/Madhumeha* [25].

1. Addiction to the pleasure of sedentary habits, lack of physical activity or exercise (*Āsya sukham*), and excessive sleeping (*Swapna sukham*).
  2. Excessive intake of curd (*Dadhi*), soup of the meat of domesticated arid aquatic animals and animals inhabiting marshy land (*Grāmyaidakānupa rasah*), milk and dairy products (*Payah*), carbohydrate-rich diet especially newly harvested e.g. rice, maida etc. (*Navānna*), freshly prepared alcoholic drinks (*Navapānam*), preparations of jaggery such as sugar, sweets (*Guda vaikrit*) and all *Kapha* aggravating factors.
  3. Excessive or regular intake of foods which are *Sheeta* (cold), *Snigdha* (oily), *Guru* (heavy) and *Abhishyandi* (blocks body channels) category.
  4. Psychological factors like fear, grief, anger etc.
  5. *Santarpana* (overnutrition or obese)
- #### 2. SHODHANA (Bio-purification Therapy):
- It is a therapeutic detoxifying treatment in Ayurvedic science for preventive, curative and promotive actions for various diseases and

rejuvenation to restore balance and well-being. *Shodhana* is a well-known procedure for its excellency to cure the disease of the root cause [24]. It includes five treatment modalities viz., *Vamana* (therapeutic emesis), *Virechana* (therapeutic purgation), *Niruha basti* (decoction enema), *Nasya* (instillation of medicine through nostrils), *Anuvāsana basti* (oil enema) [26]. These treatment modalities probably may be responsible for the alleviation of the pathological process of the disease. However, the administration at the appropriate stage of the disease is left to the discretion of the treating physician. The primary importance in the *Prameha* (DM) *Chikitsā* is the management of *Keldā* (wetness/body fluid). As per Ayurvedic guidelines, *Shodhana* therapies are significant in the management of *Prameha* as it is a *Bahudoshaja vyādhi* (quantitatively the *Doshic* imbalance is high and qualitatively the combination of *Kapha* & *Medas* (fats) is very difficult to disintegrate due to their similar nature). After *Shodhana*, *Shamana Chikitsā* is to be followed. *Deepana* and *Pāchana*, *Snehana* (oleation) and *Swedana* (sudation) are important *Purvakarmas* (preoperative

procedure) while giving any *Shodhana* therapy.

**Deepana & Pāchana** (Appetizer & Digestives): Ayurveda speaks *Agnimāndya* is the main cause of the disease and can lead to the production of *Āma* (a toxic material) that initiates and promotes disease processes. *Deepana* and *Pāchana* [27] play an important role in bringing the *Sāma dosha* (*doshas* associated with *āma*) to *Nirāma* (*doshas* without *āma*) state, as they mobilize the *doshas* from *Shākhā* (tissues) to *Koshtha* (visceral organs) and thus helps in easy expelling of *doshas* from the body. Hence, *Deepana* and *Pāchana* drugs like *Pippali*, *Maricha*, *Nāgara*, *Gajapippali* etc. are best for *Agnimāndya*. Classical formulations like *Hingvāshtaka churna*, *Avipattikara churna*, *Vaisvanāra churna*, *Mahāsudarshana churna*, *Ajamodādi churna*, *Triphalā churna*, *Chitrakādi vati*, *Agnitudi vati* can be advisable as per the case and condition.

**Snehana:** Different types of medicated *Taila* (oils), *Ghrīta* (ghee), *Kashāya* (decoction) are used in the *Snehana Karma*. *Abhyantara Snehapāna* (internal oleation) is contraindicated in *Prameha*. As *Prameha*, *Medas* and *Kapha* will be in *uthklishtha Avasthā*, *Ati Snehana* is contraindicated [28]. *Shodhananga Snehapāna* has to be administered after *Virukshana* [29]. For *Snehana*,

*Trikantakādya taila* [30], *Taila* or *Ghrita* processed with *Priyangvādi* drugs, *Dhanwantara gritha*, *Nikumbādi taila* [31], *Dhanwantara gritha*, *Simhāmrutha gritha*, *Arjunādya taila* [32].

**Swedana:** Generally, the *Swedana* is contraindicated in *Prameha* / *Madhumeha* [33]. But it has clearly mentioned that *Swedana* does *Utklehsana* and *Vilayana* of *doshas* which adhered to the *dushyas* [34]. In diseases like *Prameha*, the *doshas* are in *uthklishhta Avasthā*, so there is no need of *Swedana*. *Prameha* is characterized by *Dhātu shithilathā*, due to involvement of excessive vitiated *Kapha-meda* and *udaka*, and if *Swedana* is done it causes depletion of *Dhātus* and makes the person weak. But it is necessary to give *Swedana* in *Vamanādi karma* as *Purva karma* depending on the severity of *Āma*, *Swedana* could be done by giving *Nādi sweda* or *Snāna/seka*.

**Treatment according to Doshha predominance:**

**1) KAPHAJA PRAMEHA:**

**Shodhana Chikitsa:** *Vamana Karma* followed by *Virechana Karma* and then *Asthāpana Basti* should be given [35, 36].

**Vamana Karma:** It is the ideal treatment for *Kaphaja Prameha* [35] and it should be done with due consideration of the strength of the

patient [37, 38]. *Vamana yogas* in *Prameha* are *Madanaphala*, *Ikshuvaka* [39]. Dalhana commented that we cannot go for *Vamana karma* in *Ruksha* (dryness) patients. By adopting proper *Shodhana* at the appropriate time *Kaphaja Prameha* can be curable.

**Virechana Karma:** Dalhana further commented that after *Vamana*, *Virechana* is essential to alleviate the *Prameha* and also to reduce the *Kleda* vitiation.

**Basti Karma:** Arundatta specially commented that after completion of *Vamana* and *Virechana*, if the patient has strength then *Asthāpana Basti* should be administered [38].

*Prameha* disappears quickly by the use of para-procedures (*Upakramas*) such as *Rukshana* (*Udavartana*), *Snana* & *Jalavaseka* (bathing & pouring herbal water), *Vilepana* (external application of herbs), *Vyayama* (exercise) [40]. *Lekhana* and *Apatarpana Chikitsa* are also effective.

**Rukshana:** It is one among those *Shadvidha Upakramas* and can be performed either *Bāhya* (external) or through *Abhyantara* (internal). *Virukshana* (dehydrating therapy) is considered a treatment modality in the management of *Prameha* as it is *Bhuridosa Pradhāna vyādhi* or *Kelda*

*Pradhāna vyādhi* [41]. *Udavartana* (powder massage) is a modality by which *Bāhya Rukshana* is achieved [42]. *Abhyantara Rukshana* can be achieved by administering *Takrapāna*. *Kashāyapāna*. Decoction (*Kwātha*) is prepared with roots of *Krusha* plant and *Amalaki*. *Shyāmaka* (a kind of rice grain) is added to it and boiled. This *Yavāgu* acts as *Rukshana* [43].

**Udavartana:** It is a procedure of invigorating full body massage done in a rhythmic motion by using herbal powder or paste of *Ruksha*, *Tikshna*, *Ushna* and *Tikta* drugs. It helps to reduce the excess of *Kapha* and *Meda* through its *Shoshana* and *Lekhana* properties [44]. Charaka has mentioned that *Prameha* disappears quickly by the use of *Pragādha Udavartana* [40] (hard powder massage) as the *samprāpti* of *Prameha Bahu drava shlesma & Abaddha meda* are important among the *Dosha & Dushyas*, indicating excessive *Aap dhātu* in the body. *Aragvadhādi churna*, *Triphalādi churna*, *Kolakulathādi churna*, *Shyleyādi churna* used for *Udwaratana*.

**Snana and Jalavaseka:** The decoctions of various herbs can be used for the *Snāna* and *Avaseka*, i.e. pouring of medicated water all over the

body or body should be kept in contact with medicated water for some time. These will help to eliminate the waste products by absorption from the skin and are also effective in excessive sweating and bad smell. They will also help to regain strength [40].

**Vilepana:** Various herbs can be used for external application all over the body. These will help to eliminate the waste products by absorption from the skin and are also effective in excessive sweating and bad smelling. They will also help to regain strength [40].

**Vyayam:** Exercise is very much necessary in *Madhumeha* because it helps to reduce excessive *Meda* and *Kapha* [40] by burning extra calories. Exercise reduces the *Meda*, helps to increase the digestive power and maintains the compactness in the body tissues. It also helps to increase the potency to do work. These functions are very necessary to combat the *Shaithilya* and excess *Meda*.

**Lekhana:** Charaka mentioned that the treatment principle of *Lekhana* can be applied through purification. External application of Para-procedures and internal use of *Ruksha*, *Tikshna*, *Ushna Dravya* along with the *Langhana*, reduces excessive *Kapha*, *Meda*, *Kleda*, etc. [40].

**Langhana** (Fasting therapy): Quantity to be taken depends on the individuals Agni (Appetite). It may vary depending upon time and season even in the same person. So one must assess it & eat accordingly. Ayurveda advocates *Langhana* [40] in *Kaphaja* disorders. It means either fasting or reducing the quantity of food intake so that there is *Kapha Kshaya*. The individual should eat an optimum quantity at a proper time. One should eat cautiously and avoid overeating.

**Apatarpana Chikitsa:** Charaka has mentioned that the treatment principles which are described for *Santarpanajanya Vyādhi* like in *Medoroga* can be applied here [45].

**Shamana Chikitsa:** There are lots of herbs and decoctions mentioned in the classics for *Shamana Chikitsa* for *Kaphaja Pramehi*.

## 2) PITTAJA PRAMEHA:

### **Shodhana Chikitsa:**

**Virechana Karma:** It is the ideal treatment for *Pittaja Prameha* [39] after consideration of the strength of the patient. *Pragādha Virechana* is mentioned as a treatment modality [37] as *Abhada medas* is difficult to remove out of the body so because of the elimination of *uthklishtha Doshā*, *Tikshna Virechana* has been advised.

Example: *Jayapala beeja*, *Arka ksheera*, *Snuhi ksheera*, *Katuki*. Along with *Snāna*, *Jalāvaseka* and *Vilepāna* with the help of herbs mentioned in the classics.

**Shamana Chikitsa:** Charaka has mentioned 10 *Kashāya Yogas* [33] Sushruta has described 6 specific *Kwātha Yogas* [34] for the specific type of *Pittaja Prameha*.

## 3) VATAJA PRAMEHA:

In the case of *Vātajā Prameha* following points should be carefully noted.

- (1) Type of *Madhumeha* i.e. either *Kevala Vātajā* or *Āvaranjanya*.
- (2) Strength of the patient according to *Doshabala*, *Agnibala* and *Vyadhibala*.
- (3) Involvement of genetic predisposition.

After observing the patient care following treatment modalities can be administered.

**Shodhana Chikitsa:** *Vamana* and *Virechana* can be performed according to the strength of the patient. In *Madhumeha*, *Vāta dosha* is dominant so *Basti* therapy is the ideal treatment for it [35]. *Anuvāsana Basti* is contraindicated. Considering the above fact *Madhumeha* patients should be given usually *Tikshana Virechana*.

**Shamana Chikitsa:** Various *Kashāyas* and some *Arishta* have been mentioned

for the treatment. If there is nexus of *Kapha* with *Vāta*, then medicated oil prepared by *Kaphahara* drugs should be given. If there is nexus of *Pitta* with *Vāta*, then medicated *Ghrita* prepared by *Pittahara* drugs should be given. If more or less equal vitiation of all *Doshas* occurs, then *Yamaka Sneha* i.e. oil and *Ghrita* together prepared with respective herbs should be advised. *Samshaman Chikitsā* includes mainly *Deepana*, *Pāchana*, *Kshut* (Hunger maintenance), *Trit* (Maintenance of thirst), *Vyāyāma* (Exercise), *Ātapa* (Having exposed to sunlight) & *Māruta Sevana* (Exposing oneself to wind). According to the conditions of vitiated *Doshas* & *Dushyas*, the physician has to suggest proper *Shaman Chikitsa* to the patient. It is due to the less strength of the patient, Acharyas have mentioned different *Tarpana Upakramas* in *Vātika Prameha*.

3. **SHAMANA (Palliative Therapy):** If the *Prameha* patient is not eligible for *Samshodana* therapy, *Samshamana* therapies should be given [36]. It includes

**A) Drug therapy** - In Ayurveda, most of the drugs are indicated for Type 2 diabetes mellitus. It is hypothesized that most of these drugs may act on beta-

cell of the pancreas thus improving insulin production/ increase insulin sensitivity. These drugs may be used as an adjuvant to conventional insulin therapy in case of type-I diabetics and also to improve glycemic control and overall quality of life and to prevent long-term complications. The following are some of the classical drugs mentioned in the context of *Prameha/Madhumeha*.

1. **Vati** (tablets): *Chandraprabhā vati*, *Suddha Shilājī*, *Shilājītwādi lauha*, *Vasanta Kusumākar Ras*, *Saptāmrita lauha*, *Gokhurādi guggulu*, *Vyoshādi guggulu*
2. **Churna** (powder): *Nishāmalakādi Churna*, *Triphalādi churna*,
3. **Kwātha** (decoction): *Nishā Katakādi kashāyam*, *Phal trikādi kwātha*, *Vidangādi Yoga (kwātha)*, *Āmalaki Swarasa*, *Asanādi Kashāya*, *Nishākhadirādi Kashāya*, *Kathakakhadirādi Kashāya*, *Triphalā Kashāya*, *Mahāmanjishtādi Kashāya*
4. **Āsavārishta** (fermented liquids): *Ayaskrity*, *Lodhrāsava*, *Jambwāsava*, *Deodārvārishta*

**Note:** Out of the drugs mentioned above any one of the drugs or in the combination may be

prescribed by the physician. The duration of the treatment may vary from patient to patient. The physician should decide the dosage (per dose) and duration of the therapy based on the clinical findings and response to therapy.

**B) Single drugs used** - *Haridrā* (*Curcuma longa* Linn.), *Āmalaki* (*Phyllanthus emblica* Gartn.), *Jambu* (*Syzygium cumini* Linn.), *Udumbara* (*Ficus glomerata* Roxb.), *Haritaki* (*Terminalia chebula* Retz), *Meshashringi* (*Gymnema sylvestre* R.Br.), *Lodhra* (*Symplocos racemosa* Roxb.), *Asana* (*Saraca indica* Linn.), *Methi* (*Trigonella foenum-graecum* Linn.), *Vijayasāra* (*Pterocarpus marsupium* Roxb.), *Kāravellaka* (*Memorandia charantia* Linn.), *Saptachakra* (*salacia chinensis* Linn.), *Bimbi* (*Coccinia indica* W&A.), *Kumari* (*Aloe vera*), *Nimba* (*Azadirachtha indica*), *Guduchi* (*Tinospora cordifolia*), *Bilva* (*Aegle marmelos*), *Tejapata* (*Cinnamomum tamala*), *Tvak* (*Cinnamomum zeylanicum*), *Methi* (*Trigonella foenum graecum*), *Shuddha Shilajit* etc.

**4. RASĀYANA THERAPY** (Rejuvenation therapy): *Rasāyana* is a speciality of Ayurveda which deals with

measures for rejuvenation. Rejuvenation means to return to youthful conditions or normal from the diseased state. *Rasāyana* therapy comprises *Āchāra Rasāyana* (special health-promoting conduct and behaviour) *Āhāra* (dietary regimen) and *Aushadha* (medicine) that have properties to enhance growth, retard ageing, induce tissue regeneration and stimulate immunity. It enhances immunity (innate) or prevents diseases. Enhancing the body's natural defence system (immunity) plays an important role in maintaining optimum health and is a cornerstone of Ayurvedic practice.

**(A) Āchāra Rasāyana:** It is based on good conduct and behaviour and lifestyle principles, which would ensure freedom from disease (*Ārogya*) and victory over the senses faculties (*indriya vijaya*) [46]. These principles do not embody only good values and moral principles but incorporate several other concerns, such as practical measures for preventing health hazards, social customs and conventions, good habits, relations within and outside the family, protecting people in affliction, observing celibacy and much more [47]. They help to increase a person's mental and physical health status and help to reduce disorders very

effectively. These modifications help in the better management of stress. Stress has long been suspected of having important effects on the development of diabetes. More than 400 years ago, the famous English physician Thomas Willis noted that diabetes often appeared among persons who had experienced significant life stresses, sadness, or long sorrow [48]. Besides, Ayurveda also advises *Charyātrayees* i.e., *Dinacharya* (daily regimens), *Rātricharya* (night regimens) and *Rutucharya* (seasonal regimens) and much more for keeping the person healthy and disease-free. All people and patients must follow such healthy practices in all situations regularly to prevent diseases and promote health.

**(A) Āhāra Rasāyana:** It is based on the usage of healthy food substances (diet and nutrition) regularly to provide all the essential nutrients to the body. The nutrient deficit diet is a risk for disease and it affects overall health. Regular intake of healthy food makes the body fit and helps to develop a strong immune system to fight the onslaught of various diseases. So, it is necessary to advise healthy food substances both in healthy and diseased conditions for prevention, promotion and curative.

The following specific healthy food preparations *Kritanna (Āhāra)* are beneficial to the body when taken at an appropriate time with proper proportions. This helps to correct the morbid condition of the diseases.

1. *Nitya Sevaneeya dravyas* such as *Shashtikasāli* (rice), *Godhuma* (wheat), *Yava* (barley), *Mudga* (green gram), *Godugdha* (cow's milk), *Goghrita* (cow's ghee), *Godhuma* (wheat), *Madhu* (honey) etc. [49].
2. The use of spices like *Haldi* (turmeric), *Jeerā* (cumin), *Dhaniyā* (coriander), *Dālchini* (cinnamon), *Ela* (cardamom), *Lahsuna* (garlic) and *Shunthi* (ginger), *Pippali* (long pepper), *Maricha* (black pepper) etc., are known to contain immune-boosting antioxidants and builds immunity system which is the utmost necessary in the prevention and control of the disease

**(B) Aushadha Rasāyana:** It is based on the usage of drugs and herbs regularly to boost immunity. They can be used as mass prophylaxis and in the management of the disease. They enhance the cure rate and prevent disease recurrence. *Kāmya Rasāyana* (used to serve a special purpose in life) and

*Naimittika Rasāyana* (to promote the health of the particular system or tissues of the body and to prevent their bad effects) are used in the prevention and control of the disease. The Ayurvedic texts describe *Shuddha Shilājatu* as a *Naimittika Rasāyana* for *Prameha* and hence it is advisable to use in prediabetics or diabetic management as adjuvant therapy for promotive and preventive measure. Classically *Shilājatu* is well known for its *Naimittika Rasāyana* effect, *Ojovardhaka* and *Pramehaghna* property. Dalhana's commentary on Sushruta considered *Shilājatu* as the best *Naimittika Rasāyana* (Adjuvant therapy) for *Prameha* [50]. *Nishā Āmalaki prayoga* is highly beneficial for diabetics [51].

(C) The *Samshodhana Chikitsa* (Bio-cleansing therapy) of Ayurveda, which includes *Panchakarma* treatment, basically intends to eliminate the toxic elements from the body and thereby enhances the immunity of the bod

## 5. PATHYAPATHYA:

### Pathya: (Do's)

1. *Nitya Sevaneeya dravyas* such as *Shashtikasāli* (rice), *Godhuma* (wheat), *Yava* (barley), *Mudga*

(green gram), *Godugdha* (cow's milk), *Goghrita* (ghee), *Godhuma* (wheat), *Madhu* (honey) etc.,

▪ **Cereals:** *Purāna shāli* (old rice), *Shastic Shāli* (rice which crops within 60 days), *Yava* (barley - *Hordeum vulgare*), *Godhum* (wheat), *Kodrava* (grain variety - *Paspolum scrobiculatum*), *Trinadhānya* (millets).

▪ **Pulses:** *Ādhaki* (red gram - *Cajamus cajan*), *Kulattha* (horse gram) and *Mudga* (green gram) should be taken with bitter and astringent leafy vegetables.

▪ **Vegetables:** *Navapatola* (young *Tricosanthus dioica*), raw banana, *Tanduleyaka* (*Amaranthus spinosus*), *Vastukam* (Bathuva - *Chenopodium album*), *Matsyakhshi* (*Alternanthera sessilis*) all bitter vegetables (*Tiktashākam*) like *Methi* (Fenugreek leaves), *Kāravellaka* (bitter gourd), *Patola* (snake gourd), Pumpkin, Cucumber, *Maricha* (*Piper nigrum*), *Saindava lavana* (rock salt), *Tejapata* (*Cinnamomum tamala*), *Tvak* (*Cinnamomum zeylanicum*), *Bimbi* (*Coccinia indica*)

▪ **Fruits:** Orange, *Kalingaka* (watermelon), Apple, Guava,

- Pomegranate, *Jambu* (*Syzygium cumini*) *Kapitha* (*Feronia limonia*), *Āmalaki* (*Phyllanthus embilica*). *Kharjura*, (dates) etc fruits.
- **Spices:** Pepper, fennel seeds, asafoetida, Ginger, Garlic, Turmeric etc.
  - **Meat:** *Harina* (deer), *Shashāka* (rabbit) *Kapota* (pigeon), *Titira* (grey francolin) etc. forest animals and birds (antidiuretic properties - *Badha mutrata*).
  - **Oils:** *Nikumba* (*Danti-Baliospernum montanum*), *Ingudi* (*Balanitis egyptica*), *Atasi* (*Linum usitatisimum*), *Sarsapa* (mustard).
2. Following **Charyātrayees** i.e., *Dinacharya* (daily regimens), *Rātricharya* (night regimens) and *Rutucharya* (seasonal regimens) and much more
  3. **Exercise:** Sushruta has described that in the advanced stage of *Prameha*, one should practice regular physical exercise, wrestling, actual sports, riding on a horse, or an elephant, long walks, pedestrian journeys, practising archery, casting of javelins etc. [53]. Yoga, brisk walking, swimming, cycling, etc. calorie consuming activities.
1. Excessive consumption of *Kapha dosha* exaggerating factors.
  2. Excessive or regular intake of foods which are *Sheeta* (cold), *Snigdha* (oily/fatty), *Guru* (heavy) and *Abhishyandi* (blocks body channels) category.
  3. Excess use of new grains (*Navānna*), *Pishtānna* (foods rich in carbohydrates), *Kandamula* (root/rhizome), *Guda vaikrit* (preparations of jaggery such as sugar, sweets), *Kānjikā / Shukta* (sour gruel), *Madya* (alcohol), *Dadhi* (curds), the meat of domesticated arid aquatic animals and animals inhabiting marshy land (*Grāmyaidakānuparasah*), milk and its preparations (*Payah*),.
  4. Fruits with high simple sugars like banana, chikku (sapodilla), grapes, mango etc.
  5. Excess use of the water of rivers and tanks during rains and floods.
  6. Lack of exercise, excessive sleep during the day (*Divāswapna*) & night time, laziness (*Āsyasukham*) etc.

#### Apathya: (Don'ts) [54]

7. Psychological factors like fear, grief, anger etc.

8. *Dhumapana*, *Swedana*,  
*Mutravegadharana*, Prolonged  
fasting.

## 6. YOGIC THERAPY:

Yoga advocates prevention is better than cure, but in case the illness has progressed effective management is also possible through it. Generally, poor mental health conditions, including stress and depression, are known to increase the risk of disease. Several research studies have endorsed that Regular Yoga practices are found to be useful in the management of Type 2 Diabetes mellitus. The main aim of Yogic treatment in the management of diabetes is to stimulate the pancreatic cells to produce an adequate amount of insulin and to reduce insulin resistance. So, the following Yogic practices are beneficial for the prevention and post-recovery management of diabetes mellitus. However, these should be performed only under the guidance of qualified Yogic experts.

1. *Yogāsana* (postures):  
*Suryanamaskāra*, *Tādāsana*,  
*Katichakrāsana*, *Sarvāngāsana*,  
*Hālāsana*, *Matsyāsana*,  
*Ushtrāsana*, *Gomukhāsana*,  
*Ardhamatsyendrāsana*,

*Mandukāsana*, *Mayurāsana*,  
*Paschimottānāsana*,  
*Pawanamuktāsana*,  
*Bhujangāsana*, *Shalabhāsana*,  
*Vakrāsana*, *Dhanurāsana*,  
*Vajrāsana*, *Ushtrāsana*,  
*Shavāsana*.

2. *Prānāyāma* (breathing techniques): *Nadishodhana*,  
*Suryabhedhi*, *Bhastrika*,  
*Bhrāmari*.

3. *Yogic Kriyas* (cleansing measures): *Kunjala*, *Agnisāra*,  
*Shankhakra prakshālana*,  
*Vastra dhauti*, *Kapālabhāti*

4. *Bandhas*: *Uddiyāna Bandha*

5. *Dhyāna*: Breath awareness  
Meditation

## CONCLUSION:

The clinical conditions described in Diabetes mellitus have much in common with that described in Ayurvedic science for *Madhumeha*, a subtype of *Vātaja Prameha*. If all types of *Prameha* are not properly treated or left untreated for the long term they may ultimately get converted into *Madhumeha*. It can be concluded that the terms ‘*Prameha*’ and ‘*Diabetes*’ are synonymous. While the terms ‘*Madhumeha*’ and *Diabetes Mellitus*’ have a similar meaning. The general principle of treatment in *Prameha* applies to *Madhumeha*. However, in general, the

management of diabetes needs a holistic and comprehensive approach. The contribution of Ayurveda in the management of Diabetes has greater potential through its wider concepts and treatment modalities. Integrating the best medical practices from the treasure trove of Ayurveda along with the clinical excellence of Allopathic Medicine as prophylaxis and adjuvant therapy might be effective in reducing the risk of Diabetes successfully. Let's integrate the best of Allopathy and Ayurveda to fight Diabetes.

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