ABSTRACT

Diabetes mellitus has emerged as a global health hazard having tremendous socio-economic impact to the individual as well as whole. The prevalence of diabetes in adults globally was estimated to be 150 million and this figure is expected to double by 2025. India has being estimated fastest growing population of diabetes mellitus. It has mentioned in Ayurvedic literature Madhumeha as mahagada, and madhumeha i.e. honey like sweet urine and excessive flow respectively. Types of Prameha vataja, pittaja, kaphaja can be correlate with different stages of diabetes mellitus. Vataja prmeha is because of insulin deficiency due to autoimmune or idiopathic destruction of beta cell. Pittaja is due to over functioning of adrenal, thyroid. Kaphaja is due to malfunctioning of pancreas result improper insulin secretion. Madhumeha is type of vataj prameha. Pathogenesis of madhumeha is involvement of ama (oxidative free redicals),Agni(digestive fire), Meda(adipose tissue) recent year have Shown Ojas (immunity) which play in vital role in development & progression of madhumeha & its complication. Increasing incidence has become challenge for Ayurvedists to search for an additional effective treatment so focused on drug Morinda citrifolia, Naimittika rasayana (Shilajatu) and Yoga ,Surya namaskar, Pranayama, follow pathya-aphtha rule (herb & dietary supplement like amalaki, haritaki, yava,mudga tikta shaka, jambu, kapitha, reflexology massage, acupressure, surya mudra,vyayama) have excellent result in Management of diabetes mellitus.

Keywords: madhumeha, naimettika rasayana, Morinda citrifolia,yoga, pranayama, diabetes mellitus, Ayurvedic herb

INTRODUCTION: Diabetes mellitus is an endocrinological or metabolic disorder with an increasing global prevalence and incidence\(^1\). High blood glucose levels are symptomatic of diabetes mellitus as a consequence of inadequate pancreatic insulin secretion or poor insulin-directed mobilization of glucose by target cells. We live in 21 century where weird quality of day to day physical and mental activities leads an obsessive and erratic lifestyle. One among those topmost lifestyle disorder is prameha(diabetes mellitus). The prevalence of diabetes in adults globally was estimated to be 150 million and this figure is expected to double by 2025. Diabetes mellitus is a syndrome characterized by chronic hyperglycemia and disturbance of carbohydrate, fat & protein metabolism associated with absolute and relative deficiencies in insulin secretion . Classification of diabetes mellitus is based on its aetiology and clinical presentation. As such, there are four types or classes of diabetes mellitus viz; type 1 diabetes, type 2 diabetes, gestational diabetes\(^2\), and other specific types diabetic neuropathy is an important complication of diabetes mellitus resulting in a great deal of morbidity. In Ayurvedic literature Aacharya Charaka\(^3\), Aacharya Sushruta\(^4\), Aacharya
Vagbhatta⁵, Aacharya Madhava⁶ elaborate Madhumeha(diabetes mellitus). Aacharya Charka consider madhumeha as a mahagad⁷. The main causes of madhumeha are lack of exercise and improper food habits in excess food intake which falls in the category of ushna, snigdha and guru are the primal cause of this disease. Madhumeha (diabetes mellitus) inherently carry the risk of impaired Agni (digestive fire) & depleted ojas (immunity) status, that is hypometabolic & immunocompromised status. In our literature it’s clearly defined that health and diseases both as product of food & life style. Treatment of madhumeha is based on Shodhana (purification) & Shamana chikitsa⁸, Naimettika rasayna⁹, many drugs like Morinda citrifolia, Curcuma longa, Salacia chinensis, Yoga Asana with pathya aahara vihara able to treat Madhumeha (diabetes mellitus).

MATERIAL AND METHODS: The data was collected from scientific journals, electronic media, modern medical books & authentic Ayurvedic text. The data thoroughly analysis to understand the precise pathogenesis of dengue & disintegration as per Ayurvedic classics.

AETIOLOGY:¹⁰

Aaharaj nidan: shooka dhanya,yavaka, pistaanna, immature curd, katu tiktakasaya rasa based dravya etc.

Viharaj nidan: excessive physical exercise, indulgence in sex, irregular posture of body, exposure to sun.

PATHOGENESIS:¹⁵

Etiological factor (aasya sukha, swapna sukha, gramyodaka) ↓

Kapha increase and reach various dusya (rasa, rakta, mamsa) ↓

Shaithelyata (looseness of body) ↓

Mansik nidan: anger, anxiety, grief

Genetic factors: type 1 diabetes mellitus

Life style factors: obesity

TYPE: Prameha is classified aetiological in to-¹¹

- Sahaja due to mattraja pitruja beej dosha (Chromosomal defect from parents i.e. hereditary)
- Apathya nimittaja (Unwholesome things – food and exercise etc.)

According to physical management:¹²

- Apatharpana uthaja prameha describing the lean diabetic
- Santharpana uthaja prameha relating the obese diabetic

According to the doshic causes, these pramehas are classified as twenty types:¹³

- Vataja prameha: There are totally four vataja pramehas. Insulin deficiency due to autoimmune or idiopathic destruction of beta cell.
- Pittaja prameha: There are totally six pittaja pramehas. Over functioning of adrenal, thyroid.
- Kaphaja prameha: There are totally ten kaphaja prameha. malfunctioning of pancreas result improper insulin secretion

In modern view-¹⁴

1) Type 1- hereditry, beta cell destruction usually leading to absolute insulin deficiency.
2) Type 2- characterized by variable degree of insulin resistance, impaired insulin secretion, increase glucose production.
Fluid predominant and spread all over body
↓
While spreading it gets mixed with meda, mamsa
↓
Body fluid which vitiated drain to bladder
↓

Prameha
↓
Honey like Sweet urine
↓

Madhumeha

- **Dosha** – vata, pitta, kapha
- **Dushya** – meda, mamsa, kleda, rakta, vasa, majja, lasika, rasa and ojas
- **Srotas (channel)** – mootravaha  
  - **Srotodusti** – atipravrutti
- **Agni** – dhatvagni  
  - **Udhhavasthana** – kosta
- **Vyaktasthana** – mootravaha srotas (urinary tract)

**MODERN VIEW:**

**GENETIC PREDISPOSITION**

**LIFE STYLE FACTORS (OBESITY)**

**RELATED INSULIN DEFICIENCY (INSULIN RESISTENCE)**

**COMPESATORY BETA CELL HYPERPLASIA**

**IMPAIRED GLUCOSE TOLERANCE**

**BETA CELL FAILURE (EARLY)**

**BETA CELL FAILURE (LATE)**

**DIABETES MELLITUS**

**CLINICAL FEATURE**

- **Hasta pada daha** (Burning sensation of hands and feet)
- **Deha chikkanata** (Excess glossy/oily skin)
- **Trishna** (Excessive thirst)
- **Madhuryamasya** (Feeling sweetness in mouth)
- **Prabhuta mutrata** (Excessive urination)
- **Avila mutrata** (Turbid urination)
- **Madhu samana varna** (Urine having colour of honey)
- **Sweda** (Excess perspiration)
MODERN VIEW:
1. Polydypsia
2. Giddiness
3. Polyphagia
4. Polyuria
5. Tiredness
6. Bodyache
7. Polyneuritis
8. Visual disturbance

COMPLICATION:
- Macro-vascular complication (coronary artery disease, peripheral arterial disease, and stroke)
- Micro-vascular complications (diabetic nephropathy, neuropathy, and retinopathy)

MANAGEMENT: Life style management is apparently the cornerstone of management of diabetes mellitus. It is recognized as being an essential part of diabetes. Several drugs available in modern science for diabetes mellitus but having lots of side effect like hypoglycemia, weight gain & increase economic cost so patient prefer safe and non toxic Ayurvedic medicine and therapies. In ayurveda many treatment modalities for diabetes like Shodhan chikitsa (purification), Saman chikitsa (conservative treatment), Rasayan- chikitsa (immune modulator therapy), Yoga, Pranayama, Surya namaskar, Reflexology

RASAYANA CHIKITSA (TREATMENT MODALITIES FOR REJUVENATION):
Prameha is anusangi vyadhi and in its vatika types there is a condition of dhatukshya so Aacharya Sushruta & Aacharya Vagbhatta has described rasayana therapy for prameha. For this purpose Silajit are indicated in the text.

SILAJIT: Botanical name - Asphaltum punjabium. It acts as a powerful immune system booster. Reduce stress, physical, mental fatigue. Maintain heart health & control blood pressure, useful in the treatment of urinary disease, remove toxic from body. Ojo-vardhaka (immune-booster), Prameghana (decrease symptom of diabetes mellitus) property also having in silajit rasayana. Dose - 500 mg twice a day with water after meal.

<table>
<thead>
<tr>
<th>S.N</th>
<th>Drug</th>
<th>Botanical Name</th>
<th>Karma</th>
<th>Probable Mode Of Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AAMALKI</td>
<td>Emblica officinalis</td>
<td>Medhya, Balya for nadisamsthan(nervous system) Prameghna (decrease symptom of diabetes mellitus)</td>
<td>23 Hypoglycemic effect, anti-oxidant, anti-depressant, anti-inflammatory, tissue rejuvenating property</td>
</tr>
<tr>
<td>2</td>
<td>HARITAKI</td>
<td>Terminalia chebula</td>
<td>Kusthaghna (decrease skin disorder), Kaphghna, Balmedhya (mental)</td>
<td>24 Antidiabetic activity, antioxidant, hypoglycemic effect is</td>
</tr>
<tr>
<td>No.</td>
<td>Plant Name</td>
<td>Common Names</td>
<td>Properties</td>
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<tr>
<td>4</td>
<td>KARVELLKA</td>
<td>Mormordica charantia</td>
<td><em>Dhatuvardha</em>, <em>Tridoshhara</em>, <em>Chakshu</em> (best for eyes), 28 Balancing cholesterol &amp; blood pressure, antibacterial, tissue rejuvenating.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>SAPTARANGI</td>
<td>Salacia chinensis</td>
<td><em>Mutrasangrahani</em>, <em>madhumehahar</em>, <em>Shothahar</em> (subside oedema), <em>raktashodhaka</em> (blood purifier), 32 Antidibetic effect, decrease in serum creatinine level and body weight.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>NONI PLANT</td>
<td>Morinda citrifolia</td>
<td><em>Pramehara</em>, <em>vraranopaka</em> (wound healing), <em>manhaprasadaka</em> (happiness), 34 Decrease tri-glyceride level, reduce insulin resistance, antioxidant, anti-dyslipidemic, anti-inflammatory, glucose homeostasis, adipokinine production.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>HARIDRA</td>
<td>Curcuma longa</td>
<td><em>Shothhara</em> (subside oedema), <em>vraranopaka</em> (healing of wound), <em>raktashodhaka</em> (blood purifier), 36 Antioxidant, blood purifier, hypoglycemic, antibacterial, reducing glycaemia &amp; hyperlipidemia.</td>
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<tr>
<td>8</td>
<td>DARUHARIDA</td>
<td>Berberis aristata</td>
<td><em>Kaphghna</em>, <em>Swedjanana</em>, <em>yakritauttejaka</em> 38 Improve health &amp; functioning of pancreas naturally.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>VIJAYASARA</td>
<td>Pterocarpus marsupium</td>
<td><em>Raktpittshamaka</em>, <em>Mutrsanghrani</em>, <em>Madhumehahara</em> 39 Rich in flavonoids, strengthens the cells and maintain normal glucose level.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>METHIKA</td>
<td>Trigonella foenum-graecum</td>
<td><em>Vedanahra</em> (analgesic), <em>Shothnashna</em> (subside oedema), <em>Balya</em> (energy) 41 Best source of micronutrients. Nourish &amp; tone the vital organs.</td>
<td></td>
</tr>
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<td></td>
<td>GILOYA&lt;sup&gt;43&lt;/sup&gt;</td>
<td>Tinospora cardifolia</td>
<td>Rasayana (immunomodulator), Dahprashmana (reduce burning sensation), Kaphaghna, Premhahar (subside diabetes mellitus).</td>
<td>Reduction of blood glucose level, hypoglycemic effect, immunomodulator, diuretic effect.</td>
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<tr>
<td>11</td>
<td></td>
<td></td>
<td>lower cholesterol &amp; triglyceroids</td>
<td></td>
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</table>

FOLLOWING TYPES OF YOGA, PRANAYAMA, AASANA HELP TO TREAT DIABETES MELLITUS: AASANA:<sup>49</sup>
- **Mandukasana**: It’s an ideal asana for people with diabetes. It gently massages intestinal organs, specifically pancreas and liver, thus betterment the digestion and excretory system. This asana help heals diabetes, high cholesterol and its complications.
- **Sarvangasana**: It’s the queen of all asana; it stimulates thyroid and parathyroid glands, which are responsible for protein, fat, and carbohydrate metabolism. it stimulates pituitary and pineal glands, which controls the brain, nervous system, and all bodily sensory functions. It rejuvenates nervous system helps stop or repair nerve damage in diabetes.
- **Ardha Matsyendrasan**: The sitting half spinal twist massages the abdominal organs, increases the oxygen supply to lungs and makes the spinal supply. It also helps calm the mind and improves blood flow to spine.
- **Shavasna**: The final resting yoga pose, corpse pose, takes the body into a deep meditative state, letting it relax and rejuvenate.

**GILOYA**: GILOYA studies on *Tinospora cardifolia* (Rasayana, immunomodulator), Dahprashmana (reduce burning sensation), Kaphaghna, Premhahar (subside diabetes mellitus) with lower cholesterol & triglyceroids.

**GUDMARA**: GUDMARA studies on *Gymnema sylvestre* (Prameghna, subside diabetes mellitus), kaphvatshamka with maintaining post-prandial blood glucose level by delaying glucose absorption, antioxidant.

**YOGA**: Yoga has been the cure for various diseases since ages. Yoga has been an ancient and effective cure for numerous health related problems. The practice of yoga dates back to more than 5,000 years ago. The practice of yoga includes meditation, breathing exercises, Pranayam, Asanas and most important of all – attaining eternal peace improves all sorts of metabolism in the body. So diabetics should perform different types of yoga. Yoga now-a-days has attracted the attention of Western people.
- It improves digestion, circulation, and immunity<sup>47</sup>
- *Yoga* enhances function of neurological and endocrine organs
- It can prevents and provides relief from chronic illnesses
- Overall the body feels healthier, more energetic
- **Pranayama** controls the motion of inhalation, exhalation and the refection of vital energy.
- **Pranayama** can cure diabetes by reducing blood sugar levels.
- It also reduces the blood pressure, weight the rate of progression to the complications and the severity of the complications as well.
• **Paschimottasana:** The two-legged forward bend massages and tones the abdominal and pelvic organs, and helps people suffering from diabetes. This yoga posture helps balance the *prana* in the body and also calms the mind.
• **Dhanurasana:** The Bow pose strengthens regulates the pancreas and is highly recommended for people with diabetes. This yoga pose also strengthens the abdominal muscles and is a good stress and fatigue buster.

**PRANAYAMA:**
• **Kapalbhati:** The Skull shining breathing technique helps energize the nervous system and rejuvenates brain cells. It is very helpful for patients suffering from diabetes, as it stimulates abdominal organs. This *pranayama* also improves the blood circulation and uplifts the mind.
• **Anulom-viloma:** Improves the circulatory system, without which the processes of digestion and elimination would suffer. *Pranayama* makes the most for diabetes in controlling their blood-glucose level and A1C by boosting digestion and metabolism. Additionally, it stops diabetes complications by increasing blood circulation and calming down the mind.
• **Bhastrika:** This *pranayama* brings about a proper balance of the three *Doshas* i.e. *Vata, Pitta,* and *Kapha,* and maintains their balance. Blood is purified and the body gets rid of foreign objects and toxins. Stabilizes *prana* and calms mind, and helps the upward journey

**REFLXOLOGY:** Diabetes Causes of high blood-glucose may be due to defect in carbohydrate or glucose metabolism. This defect may be due to stomach, intestine, liver, pancreas, or muscle cells. These problems can be resolved by stimulating the respective reflex points of the organs. Massaging endocrine glands (all the seven glands); which controls the entire metabolic system.  

**SURYANAMSKAR:** The Sun is venerated because it is the central source of energy in our solar system. Salutation to the Sun is a sequence of 12 *Asanas* draw peace, harmony and strength to the body.
• Acts as detoxifying agent
• Normalizes the activity of the endocrine glands
• Makes the spine and waist flexible.
• Produces health, strength, efficiency and longevity.

**PATHYA:** The role of *aahara* (diet) is equally important in diabetes to control blood glucose level and prevent complication.  
1. **Cereals:** *Yava* (Hordeum vulgare), *Wheat* (Godooma) , *Purana shali.*
2. **Pulses:** *Mudga* (Vignaradiata greengram), *Chanaka* (*Cicer arietinum*), *Kulattha* (*Dolichos biflorus*) , *Adhaki* (*Cajanu cajan *)
3. **Vegetables:** *Tikta shaka Karela* (*Momordica charantia* - Bitter gourd), *Methi* (*Trigonella foenum-graecum* - Fenugreek), *Patola* (*Vietnamese luffa*), *Rasona* (*Allium sativum*), *Udumbara* (*Ficus racemosa*)
4. **Fruits:** *Jambu* (*Syzygium cuini*), *Amalaki* (*Phyllanthus emblica*), *Kapitta* (*Limonia acidissima*), *Talaphala* (*Borassus flabellifer* ), *Kharjura* (*Phoenix sylvestris*)
5. **Seeds:** *Kamala, Utpala*
6. **Flesh:** *Harina mamsa* (Deer flesh), *Shashaka mamsa* (Rabbit), birds like *Kapotha, Titira*
7. **Liquor:** *Old sura*
8. **Oils:** Mustard oil (*Sarshapa taila*)
DISCUSSION: The Ayurveda inspired holistic approach seems to have unique response promoting agni (digestive fire) and ojas (immunity) status leading good health & wealth. In nutshell, all Ayurvedic therapies were found to be significantly effective & clinically safe as no adverse event of adverse drug reaction. All therapies & Drugs have following probable mode of action to help reduce diabetes mellitus-

SILAJITA- Ojovardhaka (immune-modulator), Pramehaginha property
MORINDA CITRIFOLIA- Decrease triglycerides level, reduce insulin resistance, antioxidant, anti-dyslipidemia
SAPTARANGI - Antidiabetic effect, decrease in serum creatinine level and body weight.
AAMLA- Hypoglycemic effect,
HARITAKI- Antidiabetic activity,anti-oxidant
VIBHITAKI- Balancing cholesterol & blood pressure, antibacterial, tissue rejuvenating
METHIKA- Nourish & tone the vital organs lower cholesterol & tri-glycerides
HARIDRA- Anti-oxidant,blood-purifier, hypo-glycemic,antibacterial
DARUHARIDRA- Improve health & functioning of pancreas naturally
GILOYA- hypoglycemic effect, immune-modulator, diuretic effect.
KARVELLAKA- Antidiabetic, charatine act like insulin peptide shown hypoglycemic activity
GUDMARA- Maintain post-prandial blood glucose level
VIJYASARA- Rich in flavonoids, strengths the cells and maintain normal glucose level.
YOGA- Improves all sorts of metabolism in the body.

CONCLUSION: Diabetes mellitus has become a global problem in spite of advance in modern science. Ayurveda consider diabetes mellitus as kaphaj diseases in which medas (adipose factory) &ojas (bio strength) have been described as main factor. Agni & Ama also play major role in diabetes mellitus. Diabetes is one of the life style disorders so life style management in most important. Yoga, Pranayam ,Asana and different verities of Drug & Pathya aahara have excellent result with non toxic, safer quality to manage diabetes mellitus.

REFERENCES:
1. Diabetes mellitus – a devastating metabolic disorder By M.N.Piero, Published in Asian journal of Biomedical and pharmaceutical science. ISSN:2249-6228.
5. Astanga Hridya: Vag-bhata with commentaries of Dr. Bramhanand Tripathi, Reprint 2011,Chaoukhambha Sanskrita pratisthana, Delhi, Nidanasthana 10/1, p- 494.


23. Database on Medicinal plants used in Ayurveda, Published in Central Council for Research in Ayurveda and Siddha, Department of ISM&H, Ministry of Health & Family welfare, Govt. of India, Volume 3, p - 11.


25. Database on Medicinal plants used in Ayurveda, Published in Central Council for Research in Ayurveda and Siddha, Department of ISM&H, Ministry of Health & Family welfare, Govt. of India, Volume 3, p - 282.


27. Database on Medicinal plants used in Ayurveda, Published in Central Council for Research in Ayurveda and Siddha, Department of ISM&H, Ministry of Health & Family welfare, Govt. of India, Volume 3, p - 158.


29. Database on Medicinal plants used in Ayurveda, Published in Central Council for Research in Ayurveda and Siddha, Department of ISM&H, Ministry of Health & Family welfare, Govt. of India, Volume 4, p - 288.


32. Salacia sps- a potent source of herbal drug for ant diabetic and ant obesity ailments: a detailed treatise, by Ramkrishna D, published international journal of pharmacognosy and phyto-chemical research, volume 7, issue 2, ISSN: 0975-4873.


35. Database on Medicinal plants used in Ayurveda, Published in Central Council for Research in Ayurveda and Siddha, Department of ISM&H, Ministry of Health & Family welfare, Govt. of India, Volume 1, p - 152.

37. Database on Medicinal plants used in Ayurveda, Published in Central Council for Research in Ayurveda and Siddha, Department of ISM&H, Ministry of Health & Family welfare, Govt. of India, Volume 1, p -120.
39. Database on Medicinal plants used in Ayurveda, Published in Central Council for Research in Ayurveda and Siddha, Department of ISM&H, Ministry of Health & Family welfare, Govt. of India, Volume 1, p -32.
40. Antidiabetic activity of aqueous and alcoholic extracts of Ayurvedic medicinal plants; critical review on animal studies, by dr.yuvraj kale, published in international journal of innovative pharmaceutical science and research,3(12),2015,1705-1718.
41. Database on Medicinal plants used in Ayurveda, Published in Central Council for Research in Ayurveda and Siddha, Department of ISM&H, Ministry of Health & Family welfare, Govt. of India, Volume 4, p -404.
42. Traditional Indian spices useful in diabetes mellitus – an upload review, by S.V.Upasani, published in journal of pharmaceutical and biosciences, ISSN 2321-0125.
43. Database on Medicinal plants used in Ayurveda, Published in Central Council for Research in Ayurveda and Siddha, Department of ISM&H, Ministry of Health & Family welfare, Govt. of India, Volume 2, p -256.
45. Database on Medicinal plants used in Ayurveda, Published in Central Council for Research in Ayurveda and Siddha, Department of ISM&H, Ministry of Health & Family welfare, Govt. of India, Volume 7, p -265.
48. Diabetes and yoga: available at:www.diabetes.co.uk, date of assessment -10/01/2017
49. Importance of yoga in diabetes mellitus ,available at: www.artofliving.org date of assessment -10/01/2017
51. Diabetes reflexology foot massage , at: www.relexology%20massage%20for%20Diabetes%20management.html date of assessment -10/01/2017
53. Diabetes mellitus (madhumeha)-An Ayurvedic review by P.Srinivas, published in International Journal of Pharmacy& Pharmaceutical Science, volume 6, ISSN 0975-1491

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