



**IJAPC**

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**Vol. 13 Iss. 1**

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***E ISSN***  
***2350 0204***

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**WWW.IJAPC.COM**

**GGP**



## Role of *Pathya* in *Madhumeha*- A Paradise Regained

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### ABSTRACT

Diabetes mellitus is a leading cause of morbidity and mortality world over. It is estimated that approximately 1% of population suffers from Diabetes mellitus. The incidence is rising in the developed countries at the rate of about 10% per year, especially of type2 Diabetes mellitus, due to rising incidence of obesity and reduced activity levels. *Madhumeha* is caused due to *Apathyaahara* and *viharasevana*.

While enumerating the *chikitsa* for *Madhumeha* all scholars have focused on the management of *Madhumeha* with a greater importance on *Pathya*. *Ahara* is said to be *Mahabhaisajya*, where one is not able to sustain life without diet even of endowed with medicine that is why the diet is said to be the great medicament by physician. In Ayurveda, pool of information is available in scattered form. In present day scenario, there is need to collect the scattered matter and it is to be reproduced with a scientific data base in front of the modern world.

### KEYWORDS

*Madhumeha, Pathyaahara, Pathya vihara, Diabetes mellitus, Vargas*



**Greentree Group Publishers**

Received 19/05/20 Accepted 21/06/2020 Published 10/07/2020



## INTRODUCTION

Diabetes mellitus is a syndrome characterized by altered and abnormal metabolism along with inappropriate hyperglycemia due to either a deficiency of insulin secretion or to a combination of insulin resistance and inadequate insulin secretion to compensate<sup>1</sup>. This clinical condition is similar to *Madhumeha a sankledjanya vyadhi* described under the heading of *Prameha*. *Madhumeha* is one among the four varieties of *vataja pramehas*. Modern science says that “once a diabetic is ever diabetic” and *Charaka* has supported this view by saying that “*prameha anushanginam*”. The management of *Madhumeha* revolves round the triad of medication, diet and exercise. The gravity of the complications makes the patients vulnerable and in turn makes its treatment challenging and interesting. Even after so much progress in medical technology there is no curative therapy for diabetes and the only available method is palliative management. Presently there are different methods of treatment of Diabetes<sup>2</sup> viz., diet, diet and hypoglycemic drugs or Insulin. Apart from the *oushadha prayoga* few *aharaja* and *viharaja pathya* are also mentioned in the management of *Madhumeha*. Hence an attempt is made to analyze the role of *Pathya* in the management of *Madhumeha*.

## NIDANA

As it is mentioned in the classics that all the *pramehas* if not treated properly will lead to *Madhumeha*, so the knowledge of *prameha nidanas* are also important. The factors which are *Medasanjanana*, *Mootrasanjanana* and *Shleshmasanjanana* can initiate the pathogenesis of *prameha*. The *Rasas* and *Gunas* which cause *prameha* are like *Madhura*, *Amla*, *Lavana rasas*, *guru*, *picchita*, *sheeta* and *snigdha gunas*. The principle oriented classification of *nidhana* includes presence of *sheshma*, *meda* and *mutrasanjanana nidana* to complete the *prameha samprapti*. The only *Mutrajanaka*, *medojanaka* or *kaphakaraka nidana* may not end up in *Prameha*. Others like all *shleshma*, *meda* and *mutrajanaka* are also *nidanavisheshas* of *prameha*. The *nidana* has been classified based on the *doshas* also<sup>3</sup>. An interesting thing is that *pittaja* and *vataja prameha nidana* has never comprised of any particular combination of *dravyas*. While discussing *kaphaja prameha nidana* maximum combinations of *dravyas* are mentioned, which produce *prameha*. In the context of *vataja* and *pittaja prameha nidana*, *Charaka* mentioned that all these *nidanas* will produce respective *pramehas* in susceptible persons<sup>3</sup> (*Tathavidhashareerasyeva*). Hence susceptibility in the body is created by the



specific *nidanas* which are mentioned in the *kaphaja prameha* nidana. Hence the combinations of *dravyas* mentioned in *kaphaja meha nidana* can be considered as causative factors for all *pramehas* including *madhumeha*.

### Pathya:

Pathya is the one which is hita to *patha/srotas* and also to *manas*. It includes *ahara, vihara, oushadha*. It is very well quoted that

*Pathye sati gadarthasya kimaoushadha nishevanam*

*Pathyaasati gadarthasya kimoushadha nishevanam*<sup>4</sup>

As *Madhumeha* is one of the varieties of *prameha*, the *pathy* as mentioned in *prameha* should be considered henceforth in management of *Madhumeha* too<sup>5</sup>. Carakasamhita emphasizes that, the ideal diet is that which maintains the equilibrium of the body constituents. Irrational diet acts otherwise, producing disease. *Pathya* is being considered as the ideal *Ahara* (dietic regimen) which suits for the different conditions of the body, to maintain the normal state of *Dosha - Dhatus* and to bring back the imbalanced *Dosha-Dhatus* of body<sup>6</sup>. One who takes the diet appropriate to the power of digest on being aware of the wholesomeness of food and drinks, who follows it enjoys the blessing without any disease during the present as

well as in future lives. A self-controlled person, blessed by nobleman lives for 100 years free from diseases due to intake of *Hita ahara (Pathya)*<sup>6</sup>.

“Food is a substance which, when taken in the body, is able to build up or repair tissue, protect against ill health (disease) and supply material for the production of health and energy”.

The *pathya* mentioned in classics in the context of *madhumeha* can be summarized as below.

**Table1** List of *Pathya aharas* in *Madhumeha*<sup>2,5,6</sup>.

<b>A.Dhanyavarga (Cereals &amp; Millets)</b>	<b>B.Shimbhivarga(Pulses)</b>
1. Yava	1. Chanaka
2. Godhuma	2. Adaki
3. ShastikaShali	3. Kulattha
4. Kangu	4. Mudga
5. Shyamaka	5. Masura
6. Kodrava	
7. Joorna	
8. Madhulika	
<b>C.Shakavarga (Vegetables)</b>	<b>D. Haritavarga (Leafy)</b>
1. Kushmanda	1. Katillaka
2. Karavellaka	2. Shigru patra
3. Patola	3. Lonika
4. Shobhanjana	4. Dronapushpipatra
5. Brihati/ Vartaki	5. Guduchi patra
6. Bimbi	6. Kakamachi patra
7. Indravaruni	7. Vastuka
8. Karkotaka	
9. Palandu	
10. Rasona	
11. Katutumbi	
12. Koshataki	
13. Kadali kaccha phala	
<b>E.Phalavarga(Fruits)</b>	<b>F.Tailavarga(Oils)</b>
1. Karjura	1. Sarshapa
2. Aruka	2. Tila
3. Kapittha	
4. Jambu	
5. Kalinga	



A) **Aaharaja Pathya** : A properly adjusted diet is the best oral hypoglycemic therapy.

The understanding behind the planning of diet is not only to keep the blood sugar in control but also the attainment and maintenance of the sense of vigor and vitality.

### 1) **Tikta Shakha**

“Tikta rasaha trishna prashamana twak mamsa yo stirikarana... kleda medo vasa majja lasika puya sweda mutra pureesha pitta shleshma uapashoshano”...<sup>2</sup>

It does *stirikarana of twak mamsa, upashoshana of kleda, medas, rasa* etc., It is *trishna prashamana*. Since in *madhumeha* it is the *shaitilyata of deha* which provokes the *samprapti*. *Tikta shakha* does *stirikarana of twacha and mamsa*. It also does *shoshana of the dushyas* in *madhumeha*. Eg. *Mandukaparni, Vartaka, Patola, Nimba, Parpata, Karavellaka, Haridra, Kiratatikta, Must, Chandana, Jeevanti etc*

**Haridra**: The main constituents are curcumin, de-methoxycurcumin, which has PPAR (Peroxide proliferators activated receptor) stimulant and gamma ligand binding activity. This indicates that Turmeric is the main ingredient of functional food for the prevention and control of type 2 diabetes.

### 2) **Dhanya, Shashtika shali, yava**

They have the properties like *lekhana, vatahara, medhagni vardhana, bahu malakara, mutra shoshana, balya* etc., It is understood in *madhumeha* that *bahu and abaddha medas* is one of the major factor contributing for *samprapti*. Hence the *dravya* which cause *medhagni vriddhi* will surely help in overcoming *bahu and abaddha medas*. These actions can be understood in modern terms as .

Rice starch is different from other grain starches as it contains 100% amylopectin and germinated rice contains much more fibre than conventional rice, along with also 3 times the amount of essential amino acid lysine and 10 times the amount of Gama-Aminobutyric Acid (GABA). WHO recommends food stuffs which are rich in fibre, as it improves glycaemic control and reduces insulin requirements and also cholesterol particularly component of LDL. The high concentration of fibre and indigestible and refined carbohydrate in many whole grain foods may be fermented by colonised bacteria in the large intestine, producing short chain fatty acids which enter the portal circulation. The liver cells when exposed to an increase in short chain fatty acids, increase glucose oxidation, fatty acid release and promotes insulin clearance, which causes enhanced insulin sensitivity.



To summarise, high fibre diet<sup>7</sup> causes Delayed gastric emptying

- a. Stimulates liver cells.
- b. Delays absorption because of its increase viscosity
- c. Decreases appetite and weight
- d. Relieves and alleviates constipation

#### Action of Dietic Fibre<sup>8</sup>

Colonic flora

Fibre → Short chain fatty acids → Portal circulation Hepatocytes



Increased glucose oxidation

Fatty acid release

Increases insulin clearance

Example: *Yava, methika, shastika shali, shakha, amalaki, godhuma, mudga.*

**YAVA:** Properties of *Yava* according to Ayurveda

*Guna* - *Rooksha, sheeta, guru, lekhana, mrudu*

*Rasa* - *Kashaya madhura*

*Veerya* - *Sheeta*

*Vipaka* - *Katu*

The *kashaya rasa, rooksha guna* of *yava* decreases the excess *kleda* from the body by its *shoshana* effect. As the patient feels more hungry in *prameha*, *yava* reduces the increased appetite due to its *guruguna*. So that patients intake will be reduced. *Lekhana guna* of *yava* makes *medo dhatu vilayana* which helps in decreasing *medodusti* and hence obesity

also. *Yava* is *pureeshavardhaka* which acts in proper *doshanulomana*. In case of *prameha* all the *dhatu*s will be in *shithilavastha*, *yava* decreases the *dhatushaithilaya*. Because of *shukrakshya* in *prameha*, *vrashya* effect of *yava* is beneficial. As *yava* is processed with *triphala kashaya* the properties of *triphala* gets enhanced with effect of *yava*. As *triphala* by itself is a good *meha hara* and *rasayana* it further adds to the action of *yava*.

Recent updates for the dietary management of Diabetes mellitus states that diet needs to be personalized so that there is good glucose and lipid control in the patients. In majority of individuals with Diabetes, a diet that is low in fat and high in carbohydrate of cereal origin is preferred. Most of the cereal products however tend to have high glycemic index but few cereals like barley, oat etc., are exception for this. Compared to other cereals barley contains more dietary fibre component that too the soluble fibre beta-glucon. When this soluble fibre is mixed and taken with a meal, it increases the viscosity of the meal bolus and once it has reached the small intestine, the absorption of nutrients occur. This high viscosity delays the intestinal absorption. Due to delay in the absorption there will be no sudden fluctuations and control as of blood sugar is achieved. Some researchers



have shown that the postprandial plasma glucose levels may be well controlled by barley. Beta glucon and the propionic acid present in the barley reduce the cholesterol by binding to bile acids and hence removing them from the body by excretion. The barley which is presently available is 6 times processed by milling which removes the outer hull and its important fibre rich bran layers<sup>9</sup>.

**3) Madhu:** It is widely used in the *chikitsa of madhumeha*. It possess *kashayanursa, ruksha guna, lekhana, sangrahi karma*. It is used in *sthoola* and frequently in *sukumara*. Honey, is an important form of carbohydrate, but fructose transport does not occur by the sodium co-transport mechanism as in glucose. In fact fructose is transported by facilitated diffusion all through the intestinal epithelium without binding with sodium transport. Over this much of the fructose is converted into glucose through the epithelial cells. So overall rate of transport is roughly about one half that of glucose transport. It is a natural sugar substance that is an effective sweetener which induces only mild increase in plasma glucose level<sup>10</sup>.

**4) Shakas:** The shakas are mainly having *gunas like laghu, ruksha, tikta Kashaya madhura rasas, ushnavirya, katuvipaka, vatakaphanashaka, agnidipaka, hrudya, netrya, shothagna, medohara,*

*trushnanigraha* etc are antagonistic to the *doshas and dushyas of Madhumeha*. These also contain highest amount of dietary fibres, rich sources of minerals and vitamins, low caloric energy level, essential amino acids and some amino acids are also having hypoglycemic effect which in turn helps to bring back the impaired metabolic activity. Most of the vegetables from Cucurbitaceae family are having the bitter principle, cucurbitin. It is known to have the stimulatory effect on the Islets of Langerhans cells of pancreas and also increases the insulin sensitivity on the cells of peripheral tissues.

**5) Phalas:** The *phalas* described in *madhumeha* mainly having *Kashayapradhana madhurarasa, ushnavirya, madhuravipaka, trishnahara, mutrala, kanthashodhaka, lekhana, medohara and malabhedaka* properties. When these fruits are consumed in a divided doses it will have continuous antagonistic effect on the samprapti and these fruits are rich sources of vitamin B complex, vitamin C, Carotenoids, antioxidants, soluble fibres and micronutrients like calcium, selenium, zinc, copper, magnesium, potassium etc, the Seyonic compounds play a very significant role in the trans cellular absorption of insulin by the ionic exchanges between calcium influx and potassium outflux.



By the above discussion it proves how diet plays a very vital role in the management of *madhumeha*. A strict regimen of diet should be started to reduce body weight in *sthoola Prameha* by reducing diet and *krusha Prameha*, should receive weight gaining diet. This is best described as **ladder diet regime**. Diabetic food should be properly balanced with energy, comparatively low in fat, relatively high in protein. As amino acids are known to stimulate insulin secretion, a minimum amount should be added in all diabetic diet. This criterion is fulfilled by the *pathya* formulated for *madhumeha* – a perfect **Paleolithic diet**<sup>11</sup>.

#### **B) Viharaja Pathya:**

*Vyayama yogihi vividaihi pragadaihi udavartanam snanajalavasekaihi*<sup>6</sup>

*Yojanam shatam yayat khandwa salilashayan!*

*Vyayama jatam akhilam bhajan mehan vyapohati*

Different varieties of physical activities and exercise have been mentioned in terms of *vyayama*, *udvartana*, *adhwagamana*, *snana* etc., action of each can be expressed as below.

**Udvartana:** It is one of the *Dinacharya* to be followed daily. The *karya phala* includes *kapha shamana (dosah vishesha)*, *pravilayana of medas (dushya vishesha)* and *shaitilyata of shareera in madhumeha*. The action of *udvartana*

increases the circulation to skeletal muscles, causing lysis of adipose tissue.

**Vyayama :** The forms of *vyayama* quoted in the context of *madhumeha* are *chankramana*, *bharavahana*, *bhramana*, *dhanurakarshana* etc.

Among these benefits, we have to think on the *sthirata*, *sthoulyapakarshana*, *mamsa sthirata*, *meda kshaya* which would help in the *samprapti vighatana of madhumeha*.

Regular physical exercise has important physiological benefits for all diabetics. They should follow **FITT** programme.

Frequency : 4-6 days / week  
Intensity : 60-85% of maximum heart rate

WHO	Grade	H.R / Min
	Light	< 100
	Moderate	100 – 125
	Heavy	125 – 150
	Severe	> 150

Time : 20-60 min

Type : Aerobic – walking, cycling, swimming

Anaerobic- weight training

Avoid late evening exercise – nocturnal hypoglycemia

Avoid Frequent fluid intake

Avoid high impact exercise in retinopathies

Avoid exercise if blood sugar is > 250 mg% with ketonuria





Precautions during extreme hot and cold temperatures

**Mode of Action:** During muscular exercise there will be re-distribution of blood to the active muscles and increased glycogenolysis in the liver and lipolysis in adipose tissue will provide more glucose and are energy producing fuels for skeletal muscles. There will be profound reduction of local vascular resistance increase in the size of the capillary bed. In addition to the large usage of carbohydrates by the muscles during exercise they use large amounts of fat for energy in the forms of fatty acids and aceto acidic acid. The glycogen stores of the muscle become depleted almost totally<sup>12</sup>. Instead, the muscle now depends on energy from other sources like fats and glycogen stored in liver which is subsequently released into the blood in the form of glucose. This usage of glucose does not require large amounts of insulin.

Conversely, *Chankrama* without wearing footwear is preferred. It is advisable because in diabetic care certain skills are taught to avoid foot lesions, due to neuropathy eg. not to walk bare foot etc.,and also usage of fruits are advised as carbohydrate replacement. They are advised to be taken along with the meals. Fruits advised are apple, banana, orange, grapes, papaya, water melon, mango.

## CONCLUSION

There is no single diet or common meal plan recommended for patients of *madhumeha*. It is the total food requirement for maintenance of optimum body weight of the individual and distribution of the calories that counts. The aim of the *pathya* is to keep the patient as an active member of the society. *Pathya* mentioned for *madhumeha* does *samprapti vighatana* also. When a patient is diagnosed to be having *madhumeha* it should not be **“Paradise lost..... Rather it should be Paradise regained”**



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