



ROLE OF DIET AND LIFESTYLE IN THE PREVENTION OF *MADHUMEHA*

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ABSTRACT

Ayurveda is a natural health care system that originated in India since the beginning of civilization. It is described by *Acharaya Charak* that to achieve *Purushartha Chatushtaya*, *Arogya* is necessary. Ayurveda strongly emphasize on preventive and promotive aspects of health rather than curative. The concepts of *Dincharya*, *Ritucharya*, *Sadvritta*, and *Achara Rasayana* along with guidelines for healthy diet and lifestyle is well established in Ayurveda, but in current scenario, hardly anyone aptly follow it. As a result, there is tremendous rise in lifestyle disorders as pandemics, Diabetes being most menacing among them. Diabetes is the fourth leading cause of global death by disease. Type 2 DM is responsible for approximately 90% of cases. In Ayurveda, *Madhumeha* one of the types of *Vataja Prameha* is compared to Diabetes Mellitus because of having similarities of disease in respect to etiopathogenesis, clinical features and prognosis. The main causes of *Madhumeha* are lack of exercise, improper food habits, excessive intake of food having *Snigdha* and *Guru Guna* and food which causes vitiation of *Kapha Dosha*. Modern therapeutics has many limitations but Ayurvedic principles of management can help the patient to control blood glucose level and have better routine life. So Ayurvedic lifestyle guidelines of adopting a healthy dietary pattern together with physical activity are valuable tools in the prevention of *Madhumeha*.

KEYWORDS: *Arogya*, *Madhumeha*, *Dincharya*, *Ritucharya*, *Sadvritta*, Diet, Lifestyle.

INTRODUCTION

The primary aim of Ayurveda has the holistic approach for the maintenance of health and well being. The basic concept of Ayurveda about the healthy person is to maintain the equilibrium of *Sharirika* and *Mansika Dosha*. Keeping in view the holistic approach of *Ayurveda*, it may be concluded that health (Homeostatic / physiological atmosphere) can be achieved only by maintaining the equilibrium in both *Sharirika* (*Vata*, *Pitta*, *Kapha*) and *Mansika Dosha* (*Satva*, *Raja*, *Tama*), as *Sushruta* also had quoted.^[1]

These all are regulated directly by *Dosha*, *Dhatu*, *Agni*, *Mala* etc and indirectly by *Ahara* and *Vihara*. In modern era there are so many diseases emerging due to irregularities in *Ahara* / *Vihara* and may be compared with metabolic abnormalities. So it is the need of time to review the ancient systems of medicine in order to apply measure prevalent in these systems in preventing the coming epidemic of lifestyle disorders which are preventable with changes in diet, lifestyle, and environment. *Madhumeha* is attracting global importance, as it is rocking the world as non infectious epidemic/pandemic. It is often referred to as a 'Silent Killer'. Type 2 DM forms 95% of all diabetics. The WHO has projected that the global prevalence of Type 2 DM may be more than double i.e., from 135 million of 1995 to 300 million by 2025. According to WHO, its percentage may go as high as 40-45% in 2020. So, there is intense need to know the graveness of the disease and to understand the possible ways of preventive aspects of this disorder. Substantial evidence now exist to suggest that diabetes is strongly associated with increasing urbanization, population growth, aging, patient's unhealthy lifestyle choices, reduced physical activity,

obesity, behavioural, patterns, socioeconomic changes, and perhaps most important a 'western style' diet. Here, Ayurvedic *Pathya- Ahara* and *Pathya Vihara* can play a major role in disease prevention.

ETIOLOGY

1. Diet related Etiologies: *Payamsi* (Use of milk and milk preparation), *Dadheeni* (excessive use of curd), *Gramya-oudakaanupamamsa* (flesh of animals of domestic aquatic and marshy places), *Navaannapanam* (new grains), *Gudavaikruti* (jaggery and its derivatives), *Ikshurasa* (sugar cane), *Madhurahara* (sweet substances), *Pishtaahara* (carbohydrate rich food), *Adyashana* (repeated food intake), *Adhikashana* (excess food intake), *Ahitashana* (unwholesome diet), *Samashana* (improper diet). *Havisha*, a special rich food made from milk, sugar and rice offered in *Yajna* of *Daksha Prajapati*^[2]. This indicates that taking heavy foods similar to *Havisha* can cause diabetes. Other causes mentioned in *Charak* and *Ashtang Hrudya* also includes the dietary causes, the foods, drinks which increases the *Medas*, *Mutras* and diet which are sweet, sour, salty, fatty not easily digestible slimy, cold drinks like beer and molasses. Excessive use of dry substances, light food, pungent, bitter, cool items, excessive fasting etc increases *Vata* and also causes *Madhumeha*.

2. Lifestyle related Etiologies: *Asayasukham* (habituation to sitting on soft cushions for long periods) and *Swapana-sukham/Atinidra* (prolonged sleeping) are suggested as key predisposing factors for diabetes. Other causes include *Sahaja* (inherited factor), *Bhaya* (fear), *Deerga Roga* (long standing illness), *Alasya* (sedentary life), *Kaphakrut cha sarvam* (all foods and lifestyle activities which increases *Kapha*).

CLASSIFICATION

1. Classification of Prameha for the management purpose

- Apatharpanauthaja- Prameha* describing the lean diabetic
- Santharpanauthaja- Prameha* relating the obese diabetic

2. Classification according to causes of diabetes

- Sahaja Prameha*, which is genetically transmitted disorder
- Apathyannimitaja Prameha*, which arises as a result of improper diet and life styles.

3. Classification as per body type

- Sthoola* (obese)
- Krusha* (emaciated and weak)

4. Classification as per Dosha Predominance

- Kaphaja Prameha* (10 types)
- Pittaja Prameha* (6 types)
- Vataja Prameha* (4 types), according to the characteristic of urine, its volume, *Dhatu* being excreted through urine.

5. Classification of Diabetes mellitus

- Type 1 Diabetes (Beta cell destruction, usually leading to absolute insulin deficiency)
- Type 2 Diabetes (characterized by variable degrees of insulin resistance, impaired insulin secretion and increased glucose production)

6. Other types of Diabetes Mellitus

- Genetic defects of insulin action
- Genetic defects of Beta cells
- Exocrine diseases of Pancreas
- Drug induced
- Gestational Diabetes

Samprapti

The different types of *Samprapti* which are mentioned by various Acharyas are being described below:-

1. Due to *Shuddha Vata*: Due to *Vatakar Nidana*, *Vata Dosha* provoked leading to *Kshaya* of other two *Doshas* and *Sarabhoota dhatus* like *Vasa*, *Majja*, *Lasika* and *Oja*. Due to *Kshaya* of *Dhatu*, *Vata* further gets provoked. This highly provoked *Vata* draws *Oja* towards *Basti* and leads to *Madhumeha*. This is *Asadhya* to treat due to its *Arambhaka Dosha Vata* and resultant further provocation due to *Dhatu Kshaya* [3].

2. *Dhatu Kshaya Janya Madhumeha Samprapti*: The *Kshaya* of *Gambhira* and *Sarabhuta Dhatus* like *Majja*, *Vasa*, *Oja* and *Lasika* leads to *Vata Prakopa*. *Vata Dosha* gets vitiated leading to *Ksharana* of *Sarabhuta Dhatus* through *Mutra Pravriti* in such a quantity that this *Ksharana* of *Sarabhuta Dhatus* itself acts as etiological factor again for *Vata Prakopa*, hence this vicious circle goes on. But due to *Ashukaritva* of *Vata* all the stages of *Samprapti* proceeds so fast that, it leads to *Asadhya* stage of the disease very quickly [4].

3. *Aprathikaritha Vatanubandita Madhumeha Samprapti*: This type of *Madhumeha* is actually not a separate entity but it is the further stage of *Kaphaja* or *Pittaja Prameha* due to *Deerga Kalanubandha* or this may be called as ignored stage of *Prameha* due to lack of proper treatment. *Kaphaja* and *Pittaja Prameha* which are present from quite

longer period they do get *Anubandha* of *Vata* to chronicity i.e., they get converted into *Vataja Prameha* [5].

4. *Avarana Janya Madhumeha Samprapti*: Here one see that *Nidana* is same as that of *Kaphaja Prameha* but still the resulting disease is *Madhumeha*. *Guru*, *Snigdhadhi Ahara*, *Avyayam*, *Adi Vihara* etc. leads to provocation of *Kapha* and *Pitta Dosha* in turn increases in quantity of *Meda* and *Mamsa*. All these increased factors obstruct the *Gati* of *Vata* leading to provocation of *Vata* and this withdraws *Oja* from the body and takes it towards *Basti* and leads to *Madhumeha*, which is *Krichra Sadya* for treatment.

PROGNOSIS

On the basis of prognosis, three types of *Prameha* has been given by *Acharaya Charak*.

1. *Sadhya*- curable, describes patients who have been diagnosed very early in onset of disease, those who are *Sthoola* and the origin of their disease in *Apathyaja*.

2. *Yapya*- Patient under this category have *Pittaja Prameha* and certain types of *Kaphaja Prameha*. However *Yapya* (palliable) helps control the disease with treatment.

3. *Asadhya*- describes the incurable version of *Prameha* and inherited diabetes. *Sahaja* patients suffering from this variety are *Krishna* (lean).

TREATMENT

According to Ayurveda, a healthy person is one who remains established in self along with the equilibrium of *Tridosha* (*Vata*, *Pitta*, *Kapha*). Dietetic factors, lifestyle as well as environmental factors affect the *Tridoshas* and disease is the result of disturbance in homeostasis of *Tridoshas*.

1. First and foremost guideline is to avoid the diet and lifestyle related etiological factors involved in type 2 diabetes (*Nidana Parivarjana*).

2. *Sthoola* (obese)- The treatment must be based on proper utilization of excess fat i.e he should be given *Shodhana* (*Vamana*, *Virechana*, *Basti*), *Apatarpana* by diet control, *Vyayama* etc [6].

Krusha (asthenic)- In asthenic type, the treatment should be mainly based on line of increasing stamina and vitality by way of tonics (*Brumhana*) diet, drugs etc. and the patient should never be given excess *Langhana* or *Apatarpana*.

The patient whether obese or asthenic, suffers from complications like *Gulma*, *Kshaya*, pain in abdomen etc, he should always be given some food. So some type of nutrition should always be given to them.

3. Guidelines for proper use of diet like *Prakriti*, *Karan*, *Sanyoga*, *Rashi*, *Desha*, *Kala*, and the user must be taken into consideration.

4. According to *Ritu*, various diets and activities should be prescribed depending upon the nature of *Prakriti* and *Doshas*.

Pathya Ahara for diabetics in Ayurveda: Ayurveda has given utmost emphasis for the maintenance of *Pathya Ahara*.

It is said that, like bird reaches its nest on the tree, in the same way *Prameha* reaches the person who eats more, unhygienic (even by not taking bath) and lazy [7].

Ahara Chikitsa is highly effective in early onset of diseases and in case of *Kapha Dosha* predominant non

insulin dependent diabetes mellitus. Dietary management is supportive or accessory treatment for *Vata Dosha* predominant and insulin dependent diabetes mellitus patients which requires long term follow up. Quality and quantity of diet should be decided on the basis of *Agni Bala* (digestive power). The recommended diet for *Madhumeha* is detailed as follows.

1.Cereals- *Yava* (*Hordeum vulgare*-barley) rich in fiber content among all relative grains is highly recommended in diabetic diet in different forms *Asantha*, *Odana*, *Appopa* etc., *Godhuma* (wheat), *Shyamaka*, *Kodrava*, *Bajra* can be prescribed to diabetic patients.

2.Pulses-*Chanaka* (*Cicer arietinum*), *Adhaki* (*Cajanus cajan*), *Mudga* (Green gram), *Kulattha* (*Dolichos biflorus*) can be taken.

3.Vegetables- *Karela* (*Momordica charantia*), *Methika* (*Trigonella foenum*), *Patola* (*Vietnamese luffa*), *Rasona* (*Allium sativum*), *Udumbara* (*Ficus racemosa*), *Nimba* (*Azadirachta indica*).

4.Fruits-*Jambu* (*Syzygium cumini*), *Talaphala* (*Borassus flabellifer*), *Kapittha* (*Feronia elephantum*), *Dadima* (*Punica granatum*), *Amlaki* (*Emblica officinalis*).

5.Seeds- *Kamala* (*Nelumbo nucifera*), *Utpala* (*Nymphaeae stellata*).

6.Flesh- *Harina* (Deer flesh), *Shashaka* (rabbit flesh), birds like *Kapota*, *Titira*, *Lavaka*.

7.Oil-*Nikumba*, *Atasi*, *Sarshapa*, *Ingudi* (*Balanites aegyptiaca*).

8.Ghee- *Ghritha*

Others food articles - *Laja*, *Maricha*, *Hingu*, *Saindhava*, *Haridra*, *Ardraka*.

Ayurveda suggests increased intake of fiber rich green vegetables and cereals (*Patola*, *Tanduleyakam*, *Yava* etc.). *Yava* is high in fiber content (4 gm in 100gm). Comparitively whole green gram, Bengal gram have more fiber content (4gm) than green gram and Bengal gram (1gm). *Hordeum Vulgare*, *Oryza Sativa*, *Triticum Sativum*, green gram, Toor dal, fenugreek, onion, garlic, jamun etc. are recommended to diabetics by modern researchers too. Simple carbohydrates are broken down easily and increases blood glucose levels fast. Hence, simple sugars like table sugar, honey, candy, jam, cakes, and pastries etc. are contraindicated, while complex carbohydrates like cereals, whole grains and vegetables are recommended at least to 50% of diabetic food.

Role of Fruits, vegetables and spices- They are micronutrient rich, provide dietary fiber, vitamins, minerals, phytonutrients such as flavonoids, saponins, carotenoids, isothiocyanates and so on, which are essential to ensure a balanced diet. Avoid fruits with high GI like banana, cheeko, grapes, and mango etc. but orange, watermelon, apple and guava etc. can be advised. Try to avoid fruit juices; instead opt for whole fruits, as they contain more fiber and are more filling. Vegetable and fruit fibers reduce the risk of diabetes, delay sugar digestion and absorption, improve the insulin sensitivity and glucose utilization and relieve constipation. Along with rich fiber content, fruits contain considerable amount of phytates, which modulate glycemia and produce a different GI of foods. Trivalent chromium present in whole grains, seeds /nuts, green beans, cereals etc acts as a critical cofactor in insulin action and its deficiency can lead to hyperglycemia.

Table 1: 1500 calories Diabetic Diet chart suggested by the National Institute of Nutrition, India^[8]

FOOD STUFF	AMT (VEGETARIAN in gm)	AMT (NON VEG in gm)
Cereals	225	250
Pulses	60	20
Green leafy vegetables	200	200
Other vegetables	200	200
Fruits	100	100
Milk	300	150
Oil	15	20
Flesh food	-	70
This diet provides	Grams	% calories
Protein	60	15.5
Fat	37	21.5
Carbohydrates	244	63.0

EXERCISE

It has been mentioned in ancient classics that, lack of exercise (*Asyasukham*) and excessive sleep during day and night (*Swapanasukhama*) play important role in etiology of DM. These factors are the major cause of obesity, which leads to insulin resistance. So, exercise is very much important in the management of Diabetes mellitus because of its effect on blood glucose and free fatty acids.

In Ayurveda, *Vyayama* is included as daily regimen for maintenance of good health. Practice of exercise renders *Laghava*, *Karma Samarthya*, *Deeptagni*, *Meda Kshaya*, renders *Vibhakta Gatra*, *Ghana Gatra* [9]. *Sthula*

Pramehi are advised to do exercises like wrestling, horse riding, vigorous walking etc. *Krishna Pramehi* are advised to protect their strength and not to do exercise.

According to *Charaka*, this disease get immediately cured by different types of exercises, *Ruksha Udavartana*, *Avagaha* and *Parisheka*, *Snana* along with the application of ointment made of *Aguru*, *Chandan*, *Usheer*, *Ela* etc. and they are used always, person will never be its victim. The methods can be changed in the present times according to the habitat and time. Some of the hard, productive exercises prescribed by *Sushruta* are *Vyayama*, *Niyuddha* (fighting), *Kreedaa* (games), *Gajacharya* (ride on

elephant), *Turagacharya* (ride on horse), *Rathacharya* (cart riding), *Padacharya* (walking) etc.

According to finding in DPP (Diabetes Prevention Programme^[10] and De-Quing Study^[11]), a daily brisk walk of 7.5 km (brisk is walking with speed of 5km /hr) for 100 days can reverse GTT to normal. Moderate exercise such as brisk walking reduces risk of type 2 diabetes and all studies support the current recommendations of 2.5h /week of modern aerobic activity or typically 30 min /day for 5 days /week for prevention.

Exercise improves insulin sensitivity and glucose absorption, transport and uptake are increased in perfused skeletal muscle, which reduces the insulin requirement, also increases blood flow through distal muscle groups increasing oxygenation to tissues in the feet and hands thereby lessens the chances of tissue ischemia and neuropathy and increases capillary blood flow. Aerobic exercise also increases stroke volume and heart muscle contractibility, thus increasing vascular efficiency. High intensity exercise is contraindicated in poorly controlled DM as it may aggravate abnormal carbohydrate metabolism through increased secretion of insulin – counter regulatory hormones such as glucagon and catecholamines.

YOGA

Yoga provides an appropriate lifestyle intervention that would be greatly helpful in regeneration of beta cells of pancreas may be taking place, which may increase utilization and metabolism of glucose in peripheral tissues, liver and adipose tissue through enzymatic processes. Improved blood supply to the muscles and muscular relaxation along with its development enhances insulin receptor expression causing increased glucose uptake and thus reducing blood sugar. Various type of Yoga Asana performed as a preventive therapy are *Suryanamaskar*^[12] (increase blood supply and improving insulin administration), *Mandukasan*^[13] (stimulate pancreas to secrete insulin), *Dhanurasana*^[14] (improves functioning of pancreas and intestines), *Sarvanga asana*^[15] (improves blood circulation), *Halasana*^[16] (stimulates pancreas and activate immune system). Apart from this *Pranayama* as *Kapalbhati*, *Anulom-Viloma* are the best options for diabetic since reduction of stress hormones like adrenaline and cortisol lower blood glucose levels.

CONCLUSION

Madhumeha can be prevented if intervention in the form of *Pathya Ahara* and *Vihara* is applied in early stages, either pre diabetes, or healthy state. Disease *Madhumeha* is considered as one of the incurable disease because of *Vata* predominance, involvement of *Bija Dushti*, extension of disease pathogenesis upto deeper Dhatus like *Majja* etc., deficiency of *Ojas* and antagonicity on the lives of treatment of *Dosha* and *Dushya* involvement. Disorderly

lifestyle plays an important role in the development of Type 2 diabetes. Along with drug interventions, emphasis must be given to socioeconomic, behavioural and nutritional issues and to promote a healthier lifestyle (in order to increase compliance to the life style modifications) especially for the high risk individuals, dietary and lifestyle plans should be made in accordance with the day to day requirement of an individual. Due importance must be given to adopt *Pathya Ahara* and *Vihara* in daily routine, maintaining physical wellbeing, mental tranquillity and sanctity is equally critical.

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