



E-ISSN: 2321-2187  
P-ISSN: 2394-0514  
IJHM 2018; 6(3): 09-11  
Received: 03-03-2018  
Accepted: 04-04-2018

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## Lifestyle modifications in the prevention of diabetes mellitus: An Ayurveda review

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### Abstract

Diabetes Mellitus is a metabolic disorder of multiple etiology, characterized by chronic hyperglycemia with disturbance of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, action and both. The main causative factor is said to be sedentary life style and food habits. Prediabetes is one of the clinical entities appearing before Diabetes Mellitus, striking resemblance with that of *Prameha*. *Madhumeha* is also one variety of *Vatika Prameha* and is listed in *Mahagada* due to its severity and chronicity. In spite of tremendous development in anti-diabetics still there is an increasing need for better management and to improve the overall health status and to avoid the severe complications. Cost effective *Ayurveda* lifestyle modification and the medicine can contribute towards preventing and managing the burden of *Madhumeha*. India being a developing country and lack of uniform health infrastructure *Ayurveda* can contribute a lot. It very is very difficult to prescribe strict calculated calorie food so it is better to give options among the traditional foods among with possible modifications. *Ayurveda* may be very effective in management of *Prameha*, preventing or delaying complications of *Madhumeha*.

**Keywords:** *Ayurveda*, Prediabetes, diabetes, *Madhumeha*, lifestyle modification

### 1. Introduction

Diabetes Mellitus is a metabolic disorder of multiple etiology, characterized by chronic hyperglycemia with disturbance of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, action and both. The long term effects include progressive development of retinopathy, with potential blindness, nephropathy that may lead to renal failure, neuropathy with risk of foot ulcers, amputation, and features of autonomic dysfunction including sexual dysfunction. Type 2 diabetes, formerly called adult onset diabetes is the most common form (80% to 95% of all diabetes) and has an insidious onset. It remains asymptomatic for many years. Diabetes is a major public health challenge of the 21<sup>st</sup> century. Epidemiological trends indicate that without proper control and prevention diabetes prevalence will increase further to 438 million in 2030. Nearly 70% of people with diabetes live in developing countries [1]. Increasing urbanization, industrialization, economic advancements adversely affect the biological and environmental risk factors for diabetes and other communicable diseases. There is a long asymptomatic prediabetic stage before the development of diabetes. Prediabetes is one of the clinical entities appearing before Diabetes, striking resemblance with that of *Prameha*. Diabetes Mellitus strikes resemblance with *Madhumeha*. *Madhumeha* is also one variety of *Vatika Prameha* and is listed in *Mahagada* due to its severity and chronicity. Cost effective *Ayurveda* lifestyle modification can contribute towards preventing and managing the burden of *Madhumeha*. The study of *Aahar* and *Vihar* reveals the rich knowledge of the *Ayurveda* in the prevention of Diabetes by following lifestyle modification. Therefore it is essential to recognize the potential of *Ayurveda* and Lifestyle modification plays a first step in the fight against diabetes. The review was done with the objectives to study about *Prameha*, *Madhumeha* and lifestyle modification.

### 2. Materials and Methods

- All the references regarding *Prameha*, *Madhumeha* and *Pathya Ahar Vihar* are collected from various textbooks and compilation is done.
- Concept of *Lifestyle modification* and *Prameha*, *Madhumeha* is studied in detail.
- Collection of different references is done and correlation is done logically i.e. by using *Yukti Pramana* (logical inferences)

### 3. Review of Ahara Vihar

Those *Aahar* and *Vihar* which are suitable to *Pramehi* are called *Pathya* and those which induce *Prameha* are called *Apathya*. *Ayurveda* recognized the importance of food and daily activities in diabetes. In *Pathya Ahara* [2] *Pramehi* Rogi is advised *Mantha*, *Kashaya*, barley, *Leha* and light easily digestible food, oiled barley, barley cakes, flour of parched grains, lean or fat free meat, soup of *Mudga*, bitter vegetable, old *Shali*, *Shashtika* rice, wheat, and millet, pulses of *Chanak*, *Arahar*, *Kulatha*, *Munga* etc. In oil *Danti*, *Ingudi*, linseed and mustard oil can be used. In *Apathya Ahara* [3] *Pramehi* patient is advised to avoid *Sauviraka*, *Tushodaka*, *Shukta*, *Maireya*, wine, *Asava*, oil, ghee, milk and products like crud, ghee and pudding rice, milk based sweets, sugarcane items, *Pishtanna*, *Amla Yavagu*, *Panak*, *Gramya-Anupa-Audaka* meat (meat dishes with high fat contents like beef, pork, fish etc.)

In *Pathya Vihara*: *Ayurveda* has mentioned the importance of physical exercise in *Madhumeha*. *Acharya Charaka* described

various physical exercises, forceful massage, baths and showering from perfumed water of *Khasakhasa* grass, cinnamon, cardamom, eagle wood, sandal wood, and *Tagara*. *Sushruta* said that *Pramehi* patient should have exercise, *Niyuddha (Kusti)*, playing sports, riding on elephant and horse, walking and practice of exercise instruments [4]. The patient who has lack of money should go on walk of one hundred *Yojana* (800-900 miles approx), without making use of an umbrella and foot wear, adhering to the way of life of an ascetic or dig a source of water by himself or wander along with herd of cows subsisting on the dung, urine etc of the cows. In *Apathya Vihara* the patient of *Prameha* should avoid long and comfortable sitting, long sleeping, *Diwaswapna*, laziness and *Ratri-Jagarana* [5]. *Pathya* is having a key role in the management of *Prameha* [6]. *Pathya* and *Apathya Ahar* and *Vihar* according to different *Ayurveda* classics is tabulated in table no 1, 2.

**Table 1:** Dietary modification in *Prameha* (prediabetes) to prevent *Madhumeha* (diabetes and complication in diabetes)

Food Type	<i>Pathya</i>	<i>Apathya</i>
Cereals	Adequate Barley, Millet, wild Millet	Rice, processed wheat flour, Newly harvested cereals
	Less Quantity: Wheat	
Pulses	Adequate Quantity: Bengal Gram Green Gram	Black gram, Kidney beans
	Less Quantity: horse gram, Pigeon Pea	
Vegetables	Adequate Quantity: <i>Patola</i> , Drumstick, Leafy Vegetables like Fenugreek Leaves, vegetables with Bitter taste predominance like Bitter guard	Starchy vegetables: Potato, Yam,
	Less Quantity: Bottle guard, Cauliflower, Cabbage,	
Fats	Less Quantity: mustard oil, flex seed oil Meat of Goat, Rabbit.	Ghee, animal fat, Hydrogenated Ghee, Soyabean oil, Groundnut oil.
Kitchen Spices	Turmeric, Piper, Zinger, Garlic, Fenugreek seeds, Rock Salt	Excessive Mixed spices Coconut paste,
Fruits	Adequate Quantity: Indian gooseberry, blackberry,	Ripen Sweet fruits like Mango, Orange, Chiku, Grapes, Banana, Litchi, Ripe Papaya, Pear, Pineapple, Jack fruit,
	Moderate Quantity: Indian bael, elephants nut, Guava,	
	Less Quantity: Sweet lemon, Unripe Papaya, Apple,	
Drinks	Moderate Quantity: <i>Takra</i> (Buttermilk), <i>Maduudaka</i> (Honey + Water)	Sugarcane Juice, Whole Milk, sweet buttermilk, Curd, Excessive Water, Cold and Freeze Water, Soft cold Drinks, Alcohol
	Less Quantity: Skimmed Milk, Tea without Sugar, Black Tea without sugar, Green Tea	
General Guidelines	Increase Low Glycemic Index foods in diet, maintain Portion control, Reduce the quantity of food intake,	High Glycerin Index diet, mutton, Eggs, Poultry, butter and Milk products, Desserts like: different sweets, Ice cream

**Table 2:** Activities modification in *Prameha* (prediabetes) to prevent *Madhumeha* (diabetes and complication in diabetes)

Activities	Do's	Don'ts
Sitting	On Stool or Chair without support, On a Hard Surface Chair, On a Mat or Hard Cushion	on Comfortable Sofa, Chair With back support, Movable Chair, On a soft Cushion, Watching TV, Movies for Long Hours
Sleeping	On hard bed, Only at Night for 6-8 Hours	On Soft Mattress, Dunlop, Day sleeping, Night sleep for long hours,
Studying	Sitting on Mat and loudly reading	Lying on soft bed or sitting soft comfortable chair and studying
Physical Activity	Increase activity, Social activities, Sports, Farming, Gardening, Brisk Walking	Sedentary Life/ Physical inactivity-sitting or lying for longer duration
Miscellaneous	Walk to work, Travel by Public Vehicle and walk the rest to your work, climb up the Stairs,	Travel by Comfortable luxurious Vehicle, Use of Elevator
Exercise	150 Min Moderate Intensity Aerobic Physical activity Or 75 Min Vigorous activity Moderate Intensity Physical activity: Brisk Walking, Washing and waxing a car, washing windows or floors, gardening, Stair Walking, cycling in flat terrain, Aerobic Physical activity, Yoga Vigorous Intensity Physical activity: Sports (Football, Volleyball etc) Jogging, Cycling over steep terrain, skipping, Dancing, Swimming,	
Yoga	<i>Asana</i> like: <i>Matsyendraasana</i> , <i>Vajraasana</i> , <i>Pacchimotasana</i> , <i>Pranayama</i> like: <i>Bhramari</i> and <i>Bhastrika</i> , <i>Kapalbhati</i> .	

### 4. Discussion

*Prameha* is *Anushangi Vyadhi*, which signifies it a lifestyle disorder. In *Prameha* the etiological factors aggravate *Kapha*, *Pitta*, *Meda* and *Mamsa* and obstruct the normal pathway of *Vata*. Agitated *Vata* carries the *Ojas* to *Basti* (urinary bladder) and manifest as *Madhumeha*, which is difficult to cure [7]. If a person follows the dietary rules for particular disease there is very little significance of drug treatment and when a person is exposed to *Apathya* the drug treatment has no value, because

without *Pathya* drug can't cure the disease. As all the *Dosha* and *Dhatu* except *Asthi* along with *Oja* are involved in the pathogenesis of *Prameha*. Regular *Pathya Sevana* is very important. Modification of the diet consists of maintenance of proper nutrition and monitoring of calories ingested, individual food sources that make up these calories and the distribution of the calories throughout the day. Attainment of optimum body weight results in marked reduction in hyperglycemia and increase in target cell response to insulin.

For a healthy body we need to discourage the harmful life style (*Vihara*) and find out the high risk population and make them adopt the real principles of life style through *Sadvrittapalana* [8]. The diabetes prevention program with intensive changes in lifestyle (diet and exercise for 30 min/d five times a week in individuals with Impaired Glucose tolerance prevented or delayed the development of type 2 diabetes by 58% compared to placebo [9]. In *Ayurveda* prospective it is important to realize that the diabetic habits vary from person to person and a study on individual diet choice is essential before any modification is suggested. Barley and green grams have high amount of dietary fiber which may be beneficial for metabolic syndrome. All the types of bitter vegetables [10] (*Tikta Shaka*) eg, *Karela* (*Momordica charantia*), *Methi* (*Trigonella foenum*), *Patol* (*Trichosanthes dioica*), *Rason* (*Allium sativum*). *Udumbara* (*Ficus racemosa*) etc. can be allowed to take as pathya. The low glycemic index, fiber and protein help to regulate blood sugar. Consuming jamun fruits daily certainly help to enhance the insulin activity and sensitivity. *Amalaki* fruit with full of vitamin C, B and several exceptional phytonutrients helps to decrease blood glucose in diabetics. Diabetes being a disease of deranged metabolism, special attention should be kept on the conditions of digestion (*Agni*) and metabolism. Not only selection of right food, is important but the processing of food, quantity of food and frequency of intake. Hard exercises have been prescribed for diabetics and obese persons. This is meant for proper utilization of fat and to consume the glucose in the body. The methods can be changed in the present time according to habitat (*Desh*), and time (*Kala*). Sedentary people more insulin resistant than active people with same degree of obesity [11]. The importance of restricted diet and increased physical activity was recognized by *Susrutha* and had advised to live a life like beggar or saint who lives on food received as charity or donations after moving from door to door and village to village. It is clear such food shall be less in quantity, poor in calories and fit for prediabetics. Living like a saint or beggar also signifies life with more physical activity but less mental stress. In developing country like India with so many cultural variations it very is very difficult to prescribe strict calculated calorie food. So it is better to give options among the traditional foods among various cultures with possible modification.

## 5. Conclusion

Unhealthy lifestyle probably initiates and propagates the majority of type 2 diabetes. Lifestyle modification helps to prevent the onset of disease. Though diabetes is difficult to cure, but proper lifestyle regimen help in preventing the onset and the complications.

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