

ROLE OF DIET AND LIFESTYLE IN THE PREVENTION AND MANAGEMENT OF DIABETES MELLITUS: A REVIEW

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ABSTRACT

India has been projected by WHO as the country with the fastest growing population of diabetic patients. Ayurveda, India's traditional medical system has a wealth of knowledge regarding *Prameha* (Diabetes). *Prameha* is a term that refers to a condition in which the body excretes more urine than usual. The rapid global rise of this disease indicates that its causes are possibly closely associated with the routine lifestyle and irregular dietary habits. Diabetes is also the medical condition, which presents with a preclinical phase having a possibility of reversal if its possible causes can be properly understood and managed to eliminate. It is said that prevention is better than cure, so we need to know the causes of diabetes so that one can prevent its occurrence. According to Ayurveda, Diabetes Mellitus has striking resemblance to *Prameha* as described in developed knowledge about this disease. Thus efforts have been made to prevent diabetes by attempting to identify the causative factors and then proposing the ways to avoid them through lifestyle modification and dietetics according to Ayurveda. This could be a most pragmatic way forward in Diabetes management either in prevention of its incidence or spread and prevention of its complications.

Key Words: *Prameha, Nidanaparivarjana, Achar Rasayana, Pathya Ahara, Sadvritta*

INTRODUCTION: Diabetes is an important public health menace from many of the perspectives. Its high morbidity, mortality, economic impact, resource consumption, systemic complications, silent yet progressive nature, and less curative options listed it among most searched and researched disease entity by the common people and by the global scientific community alike.^{[1][2]} The existing management strategies have mostly been unable to stop the progressive course of diabetes or to prevent the development of its complications. This current scenario of this dis-

ease is likely to worsen in the coming decades. Thus the most pragmatic way to deal with diabetes could therefore be its absolute prevention by avoiding the causative factors and selective prevention by adopting the proper lifestyle and diet mentioned in ancient texts during the pre-diabetic stage itself. According to Ayurveda, Diabetes Mellitus has striking resemblance to *Prameha* as described in developed knowledge about this disease. The special features of the *samprapti* of *prameha* are:

Table No.1- Features of the *samprapti* of *prameha*:

According to ayurveda (<i>prameha</i>) ^[3]	According to modern (diabetes mellitus) ^[4]
Initiating <i>dosha-kapha/bahudrava sleshma</i> & Precipitating <i>dosha-vata</i>	Can be correlated with high levels of triglycerides and cholesterol
Multiple <i>dushya</i> , involving all systems of the body	As cardiovascular diseases, chronic renal failure,etc.
Depletion of <i>agni</i>	metabolism

Emphasis on <i>dushyatva</i> of <i>meda</i> & <i>vasa</i> , <i>Ojabala kshaya</i>	Sub-optimal metabolism-nutritional aberration at the tissue level Loss of immunity
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Why Is The Prevalence Of DM Increasing?^[5]

- *Asayasukha* (Sedentary lifestyle)
- *Swapanasukha* (prolonged sleeping,*diwaswap*(afternoon naps)
- Excess consumption of dairy products
- Having flesh of animals of domestic, aquatic & marshy places.
- Utilization of freshly harvested cereals and pulses
- Ingesting sugarcane products, food that leads to vitiation of *kapha*(*dosha*)&*meda*(body fat)
- Anxiety, anger, worry, grief & similar other stress producing factors
- *Madhyapana* (alcohol intake)

These all are the factors adopted in the day-to-day life in today's modern society which contributes to the causative factors.

Causes Leads To Risk Factors:

Those who have habit of over-eating, one who doesn't take bath (unhygienic) or doesn't do exercise, physically less active, obese, having oily & fatty food, milk products are considered at greater risk of *Prameha*.^[6]

Thus it has been observed that Ayurveda has a well-developed conceptual framework of DM that incorporates diet & lifestyle as causative factors & a multi-factorial approach to management.

Prevention According To Ayurveda:

The holistic approach of Ayurveda for prevention on Diabetes mellitus, which includes:

1. *Nidanaparivarjana* (Avoidance of disease causing and aggravating factors)
2. *Pathya ahara* (

 - *Ashta ahara vidhi-vishesh*

3. *Pathya vihara* (Diet regimen)

4. *Dinacharya*(daily regimen for healthy living)

- *Snana*(Bathing)
- *Vyayama* (Exercise)
- *Udvartana* (Rubbing the body by coarse herbal powders)
- *Chankraman* (Brisk Walking)

5. *Ritucharya*(seasonal regimen for healthy living)

6. *Achara rasayana*(social conducts)

7. Meditation

8. Yoga

Lifestyle Modifications As Per Ayurveda (*Achar Rasayana*)

Manasik Sadvritta:

Anger and hostility are associated with diabetes and influence HbA1c in diabetic patients struggling with glycemic control.^[7]

Samajika Sadvritta:

Nivrttam madyamaithunat- abstaining from liquor and excessive sexual intercourse.^{[8][9]}

Jitatmanam-optimist & positivist.^[8]

Prashantam-calm^[10]

Dharmik Sadvritta:

Religious involvement or spiritual well-being helps in coping with social isolation^[11] and depression in T2DM patients^{[12][17]}.

Sharirika Sadvritta:

Dinacharya

- *Dina-day, achar-chores/behaviour.* In order to keep the *tridoshas* and *agni* (metabolism) in a state of healthy equilibrium, ayurveda prescribes a specific daily routine. Of which following are the chores that closely relates to *prameha*.

Vyayamadi in Prameha:^[13]

- *vyayama*

- *udvartana*
- *snana, etc*

Snana:

Bathing removes somnolence, (inordinate) bodily heat and a sense of fatigue. It allays thirst and checks itching and perspiration, brings on a fresh relish for food, removes all bodily impurities, clears the sense-organs, gladdens the mind, purifies the blood, increases the appetizing power, destroys drowsiness and sin, and increases semen.^[14]

Vyayama:

Lightness of body, ability to do work, improves digestion, depletion of fat, kaphadi *dosha kshaya*.^[15]

Udvartana:

Vata dosha har, Mitigates *kapha*, Liquifies the fats, Produces stability of the boy part and excellence of skin.^[16]

Vyavaharika Sadvritta:

- *Upasitaram*- self control
- *Satyavadinam*- speaking the truth
- *Priyavadinam*- sweet spoken

These all helps maintaining good behaviour which also helps in Marital adjustments, high family cohesion and social support which are important in improving glycemic control and self-management behaviour^[17]

Ayurvedic Dietetics:

1. Selection of food based on *prakriti*

Prakriti is one among several other factors that predisposes the individual for certain diseases and in the case of diabetes, people with *kapha* predominant *prakriti* are more prone to develop the disease. Individuals of *Kapha* predominant *prakriti* are slow metabolizers, they can tolerate hunger and thirst, require small amounts of food and takes more time to digest. They may show weight gain even with small quantity of

meals and their propensity for obesity is high. Hence, they are advised to undergo periodic fasting, consume small meals, especially with pungent, bitter, and astringent tastes. Hence modifying the diet in a *kapha* predominant *prakriti* could prevent or delay the onset of diabetes.^[18]

2. Selection of food based on *guna*^{[19][20]}

The selection of food items based on their *guna* (attributes) takes into account, the *prakriti*, *vikriti* (diseased state), seasonal variations and *agni*. For instance,

- black gram (*udid*)- heavy and difficult to digest ;whereas
- green lentil(*mudga*)- light and easy to digest.or e.g. in an individual with *kapha* type of *prakriti*, since *kapha* is *guru* (heavy) and *snigdha* (unctuous), diet with similar qualities might aggravate *kapha*, leading to diseases of its imbalance. Hence the food should possess qualities that counterbalance *kapha* to maintain the *dosha* equilibrium.

Similar is the case in *vikriti* (diseased state) where administering food with opposite qualities of the aggravated *dosha* will enable in pacifying the disease.

Along with *guna*, the concept of *rasa* (taste) is also a key factor in selecting the diet because each *rasa* has its effect on the *tridosha* and *agni* of the individual. For example, *Madhura* (sweet), *amla* (sour) and *lavana* (salty) aggravates *kapha* but pacifies *vata*.

In prevention of diabetes, the general advice is to avoid excess intake of *guru*, *snigdha*, *madhura* and *amla* predominant foods.

***Mudga* :^[19] (Green gram)**

Rasa-kashaya-madhura

Guna-ruksha,vishada

Thus reduces excess *kleda* from body by its *shoshana* effect

Dosha-diminish kapha-pitta

Masha:^[20] **(Black gram)**

Rasa-madhura

Guna-guru

Thus it will help increasing *kapha dosha* and can it prove *apathyā ahara* in *prameha*

3. Selection of food based on Samskara^[21]

Samskara or processing of dietary items in order to bring changes in the attributes for better palatability or preservation is also another important factor to be considered while choosing the food. The same food stuff can be processed differently and they attain different *guna* depending upon the method of processing. For example, puffed rice is lighter to digest compared to flaked rice.

- Ayurveda makes use of medicated diet, where dietary items are processed with medicinal herbs to bring about therapeutic effects in the body.
- eg:- *dashamoola yavagu* which contains rice gruel processed with roots of ten medicinal plants. This is being currently investigated for its efficacy in bringing glycemic control as well as preventing complications of diabetes.

4. Selection of food based on age^[22]

Age of the individual is significant in deciding the diet because of the varying metabolic demands in different age groups and also the *dosha* predominance in each age group.

- *Kapha dosha*-childhood
- Thus, individuals with *prakruti* dominatinated by *kapha dosha* follows a diet that does not derange *kapha* in the childhood could delay the onset of diabetes especially in predisposed individuals.

5. Selection of food based on desa^[23]

Desa or habitat where the food is produced and consumed is also important, as Ayurveda advocates intake of food cultivated in respective habitats to be more congenial for individuals.

- eg: flesh of animals in *jangala pradesh*
- *Guna-laghu*
- *Rasa-kashaya*

6. Quantity & time consideration:

Ayurveda does not advice absolute restriction of any of the food substances, rather recommendations are based on the *dosha* state.^[24] For example, in diabetic patients with *vata* predominant manifestations, extensive use of various oils has been mentioned.

Another area where modern dietetics contradict ayurvedic principles is advice of frequent small servings. Frequent intake of food hampers the digestive process and is validated by a recent randomized crossover study, in which it is found that eating two larger meals a day (breakfast and lunch) is more effective than six smaller meals in a reduced-energy regimen for patients with type 2 diabetes.^[25]

DISCUSSION: Ayurveda in reference to *Prameha*, is a clinical entity having resemblance to diabetes which presents a vivid description about disease *Purvarupa*.

Purva Rupa : *Purva* = prior; *Rupa* = features, As per Ayurvedic understanding, are the subtle clinical features which arrive before the full manifestation of a disease. *Purvarupa* also arrive as sign to act early and manage through their timely identification. A timely observation of *Prameha Purvarupa* among diabetes people may eventually help one make effective changes in the lifestyle and other dietary routines so that the pathogenic progress may be ceased. Any retrospective presence of *Prameha Purvarupa* among diabetes people may come as a clue about

the possible appearance of such features as a consequence of the process of diabetes development. Such knowledge may eventually help us developing an advisory on the basis of such warning features as the telltale of upcoming diabetes. Another way to prevent diabetes could be based on the prevention of causative factors which found to have an association with the development of diabetes. Identification of such causative factors and finding the effective ways to reduce those risk factors could therefore be the practical approach in treating and preventing diabetes in near future. Apart from the above mentioned preventive and dietary measure, the following can be practiced too. *Pathya Ahara* In Diabetes Mellitus:^[26]

- Flesh of animal living on land(non-marshy area),pulses like mudga,cereals and millets like *synamaka,kodrava,uddalak,godhuma,chanaka,adhki.kulattha* which are stored for an year after harvesting are ideal to consume.all types of bitter pot herbs and vegetables also are healthy for diabetic patients.
- Barley (*yava*) preparations &*Sali* (rice variety) may also be used as staple diet.

Importance of yava in diabetes:^[27]

Yava (*Hordeum Vulgare*) is one of the specific *pathya* explained in *prameha chikitsa* by all the *Acharyas* by telling “*yavapradhanastubhavetpramehi*”^[26]

- The different preparations of yava are explained in the text like *Yavaud(yavanna), Vatya(yavamanda), yava saktu(flour of yava), apoopa(chapati,puri), dhana(fried yava)*
- *Ras-kashaya* : Reduces excess *kleda* from body by its
- *Guna-ruksha* : *Shoshana* effect
- It also reduces excess appetite

- *Guna-lekhana*: It does *medodhatu vilayan* which helps in reducing *medodushti* and beneficial in obesity

Simplest Prevention Guideline for a Common Man: A different guideline is mentioned in ayurvedic texts according to the different types of peoples. A diabetic unaffordable and friendless person should lead a life of perfect continence like an ascetic, forego the use of shoes and umbrella and walk a hundred *Yojanas* or more on foot without staying for more than one night at a single village. A rich man (suffering from *Prameha*) should live on *Shyamaka,Kapittha,Tinduka* and *Ashm antaka* and live among the deer. He should constantly follow the tracks of cows and take their dung and urine (for food and drink). A *Brahman* patient should live on the grain, spontaneously fallen from plants, constantly study the *Vedas* and draw chariots occupied by *Brahmanas*. A patient belonging to the lower orders of society (*Sudras*, etc.) should be made to sink wells (under such circumstances) and the strength of a weak or emaciated patient should be preserved (with nutritive diets, etc.).^[28]

CONCLUSION: Ayurvedic concepts and practices on health, food, and nutrition are relatively different from those of biomedicine and modern nutrition. Systematic investigation can provide new insights into nutritional sciences to provide solutions in contemporary healthcare, for instance, how diet and life-style can be modulated to suit one's *prakriti, age*, and season. Moreover, prevention and management of lifestyle diseases like diabetes can only be achieved by tailoring the measures to meet the individual demands rather than adopting a generalized strategy.

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