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Role of Ayurvedic dietetics and lifestyle modifications in Diabetes Mellitus

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ABSTRACT

Since a long time, Ayurveda has been emphasizing more on the importance of diet and lifestyle in the maintenance of health. It is also said that in both the conditions, viz. health and disease, the wholesomeness and the unwholesomeness is a prime factor to be thought about, as without proper diet, the use of any drug is futile. Centuries ago, Ayurveda laid the concepts of *Dinacharya* (daily regimen for healthy living), *Ritucharya* (seasonal regimen for healthy living), *Sadvaritta* (moral conducts) and *Achara Rasayana* (social conducts) as well established guidelines for healthy diet and lifestyle; but in current era, hardly anyone aptly follow it. As a result, there is tremendous rise in lifestyle disorders as pandemics, diabetes being the most menacing among them. The aim of this review is to bring into the limelight the Ayurvedic dietary and lifestyle guidelines for prevention of type 2 diabetes and available factual research evidence validating it.

Key words: *Ayurveda, Diabetes Mellitus, Dietetics, Ahara Vidhi Vidhana, Vihara.*

INTRODUCTION

Diabetes Mellitus (DM) is a major non-communicable disease with increasing prevalence at global level. Poorly controlled diabetes leads to several complications, including heart diseases, stroke and death. Ayurveda describes improper diet and the subsequent gut dysfunction as the prime factor in formation of *Ama* (partially digested or toxic end products) which further leads to various diseases including DM (*Prameha*) and other diseases similar to metabolic syndrome in Biomedicine.[1] To prevent formation of *Ama*, Ayurveda advocates eight principles of *Aharavidhi* (rules governing Diet dynamics). Further, it is advised to avoid improper eating patterns like irregular timings and food intake before digestion of the previous meal. The concept of *Virudhahara* (incompatible foods) in disease pathogenesis is also unique to Ayurvedic Dietetics.[1] The existing Medical Nutrition Therapy (MNT) guidelines revolve around what to eat and concentrate more on macro and micronutrients with their caloric and glycemic values. Although it emphasizes on individualization, Ayurveda has much broader principles of adapting the diet, with due emphasis on individual factors including the *Prakriti* (body constitution), *Dosha* (body humor), *Agnibala* (digestive power), *Desa* (place of living), *Kala* (season) and *Satmya* (personal compatibility) of the patient.

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Etiology and Prevalence[2]

Diabetes mellitus (DM) comprises a group of metabolic disorders that share the common phenotype of hyperglycemia. DM is currently classified on the basis of the pathogenic process that leads to hyperglycemia. Type 1 DM is characterized by

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insulin deficiency and a tendency to develop ketosis, whereas type 2 DM is a heterogeneous group of disorders characterized by variable degrees of insulin resistance, impaired insulin secretion and excessive hepatic glucose production. Other specific types include DM caused by genetic defects [maturity-onset diabetes of the young (MODY) and other rare monogenic disorders], diseases of the exocrine pancreas (chronic pan-creatitis, cystic fibrosis, hemochromatosis), endocrinopathies (acromegaly, Cushing's syndrome, glucagonoma, pheochromocytoma, hyperthyroidism), drugs (nicotinic acid, glucocorticoids, thiazides, protease inhibitors) and pregnancy (gestational DM). The phenotype of these monogenetic and secondary types of DM typically resembles type 2 DM; its severity depends on the degree of beta cell dysfunction and prevailing insulin resistance. Type 1 DM usually results from autoimmune destruction of pancreatic beta cells; it is also known as juvenile onset diabetes because its peak incidence is in children and adolescents.

The prevalence of DM is increasing rapidly; type 2 DM frequency in particular is rising in parallel with the epidemic of obesity Between 1985 and 2010, the worldwide prevalence of DM has risen almost 10 fold, from 30 million to 285 million cases. In the United States, DM prevalence in 2010 is estimated at 26 million, or 8.4% of the population. A significant portion of persons with DM are undiagnosed.

DM is attended by serious morbidity and significant mortality; it is the fifth leading cause of death worldwide.

Clinical Features[2]

Common presenting symptoms of DM include polyuria, polydipsia, weight loss, fatigue, weakness, blurred vision, frequent superficial infections and poor wound healing. In early type 2 DM, symptoms may be more subtle and consist of fatigue, poor wound healing and paresthesias. The lack of symptoms is the main reason for the delayed diagnosis of type 2 DM. A complete medical history should be obtained with special emphasis on weight, exercise, smoking, ethanol use, family history of DM and risk factors for cardiovascular disease. In a patient with established DM, assessment of prior diabetes care, HbA1c levels, self-monitoring blood glucose results, frequency of hypoglycemia, and pt's knowledge about DM should be obtained. Special attention should be given on physical exam to retinal exam, orthostatic BP, foot exam (including vibratory sensation and monofilament testing), peripheral pulses, and insulin injection sites.

Acute complications of DM that may be seen on presentation include diabetic ketoacidosis (DKA) (type 1 DM) and hyperglycemic hyperosmolar state (type 2 DM).

The chronic complications of DM are listed below:

- **Ophthalmologic:** Nonproliferative or proliferative diabetic retinopathy, macular edema, rubeosis of iris, glaucoma, cataracts.
- **Renal:** Proteinuria, end-stage renal disease (ESRD), type IV renal tubular acidosis.
- **Neurologic:** Distal symmetric polyneuropathy, polyradiculopathy, mononeuropathy, autonomic neuropathy.
- **Gastrointestinal:** Gastroparesis, diarrhea, constipation.
- **Genitourinary:** Cystopathy, erectile dysfunction, female sexual dysfunction, vaginal candidiasis.
- **Cardiovascular:** Coronary artery disease, congestive heart failure, peripheral vascular disease, stroke.
- **Lower extremity:** Foot deformity (hammer toe, claw toe, Charcot foot), ulceration, amputation.
- **Dermatologic:** Infections (folliculitis, furunculosis, cellulitis), necrobiosis, poor healing, ulcers, gangrene.
- **Dental:** Periodontal disease.

Ayurvedic diet protocols for diabetes

1. First and foremost guideline is to avoid the diet and lifestyle related etiological factors involved in type 2 diabetes (*Nidana Parivarjana*).[3]

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2. *Sthula Madhumehi* person diet should be *Apatarpanaguna* and heavy for digestion, while *Krisha Madhumehi* persons diet should be *Santarpanaguna* and light for digestion. *Krisha* patients diet should be such that it doesn't increase *Meda.*[3]
3. Octafactor guidelines for proper use of diet like *Prakriti, Karana, Samyoga, Rashi, Desha, Kala* and the user, must be taken into consideration.[4]
4. According to *Ritu* (seasons), various diets and activities should be prescribed depending upon the nature of *Prakriti* and *Doshas.*[5]

Pathya Ahara for diabetics in Ayurveda

Ayurveda has given utmost emphasis for the maintenance of *Pathya Ahara.* Ayurveda stated that if one take wholesome diet and activities suitable to all *Dhatus* (tissues), he can never suffer from *Madhumeha.*[6] 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. Quantity and quality of diet should be decided on the basis of *Agnibala* (digestive power).

The recommended diet for *Madhumehi*[3],[7]

Group	Name of items
Grains	*Yava* (barley) - *Hordeum vulgare*, *Godhuma* (Wheat) - *Triticum sativum*, *Shashtika Shali* (rice) - *Oryza sativa*, *Kodrava* (grain variety) - *Paspolum Scrobiculatum*, *Uddalaka*, *Shyamaka*, *Bajara.*
Pulses	*Chanaka* (bengal gram) - *Cicer arietinum*, *Adhaki* (toor dal) - *Cajanus cajan*, *Mudga* (green gram) - *Phaseolus aureus*, *Kulattha* (Horse gram)- *Dolichos biflorus*
Vegetables (bitter and astringent)	*Methika* (fenugreek)- *Trigonella foenum*, *Patola* (pointed gourd) - *Trisanthus dioica*, *Karvellaka* (bitter gourd) - *Momordica charantia*, *Tanduleyaka* (*Choulayee*) - *Amaranthus spinosus*, *Vastukam* (*Bathuva*), *Shobhanjana* (drum stick)- *Moringa oleifera*, *Karkotaka* - *Momordica dioica*, *Rasona* (garlic) - *Alium sativum*, *Kadali* (raw banana) - *Musa paradisiaca.*
Fruits	*Jambu* (Jamun) - *Eugenia jambolana, Talaphala* - *Borassus flabellifer*, *Amalaki* (goose berry) - *Emblica officinalis*, *Kapittha* (monkey fruit) - *Limonea acidissima*, *Dadima* (pomegranate) - *Punica granatum*, *Tinduka* - *Disospyros embrayoptesis*.
Seeds	*Methika, Kamala* - *Nelumbo nucifera*, *Utpala* - *Nymphoea stellate.*
Flesh (fat free meat; forest animals, forest birds)	*Harina* (deer flesh), *Shashaka* (rabbit), Birds likes - *Kapota* (pigeon), *Titira, Lavaka.*
Fermented or alcoholic liquids	*Madhveeka Sura, Madhvasava* (in *Kapha Pittaja Prameha*), *Purana Sura* - old wine.
Other natural products	*Madhu* (honey), *Madhudaka* (honey mixed with water)
Oils	*Nikumba* (*Danti* - *Baliospernum montanum*), *Ingudi* (*Balanitis egyptica*), *Atasi* (*Linum usitatisimum*), *Sarshapa* (Mustard).
Others food articles and spices	*Dhani* (pop corn of jowar), *Laja*/Murmura (puffed rice), *Maricha* - (Piper nigrum), *Saindhava* - (rock salt), *Hingu* - (asafoetida), *Haridra* - (Turmeric), *Ardraka* - (Ginger).

Contemporary supporting data

Researchers have proved that 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 diet. Another study suggest to avoid high fat, salt, alcohol, caffeine and refined (white) foods such as white sugar, white flour, white bread, pastries and so on.

These have highglycemic index (GI) and will cause the blood sugar levels to spike.[8] Ayurveda suggests increased intake of fiber rich green vegetables and cereals (*Patola, Tanduleyakam, Vastukam, Yava,* etc.). *Yava* (barley) is high in fiber content (4g in 100g) and is highly recommended in diabetic diet in different forms. In a primary clinical trial in normal subjects,

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blood sugar pattern was recorded after giving different types of food such as wheat *chappati*, barley *chappati*, bajra *chappati*, maize *chappati*, gram *chappati* and rice with *Patola* curry separately. Three blood samples were taken at hourly intervals. The maximum rise was recorded in rice, followed by wheat while the minimum rise in the case of *Yava* which surpasses all cereals and pulses. Thus barley proved to be the best diet for patients with *Prameha.*[9] Comparatively, whole green gram, Bengal gram have more fiber content (4g) than green gram dal and bengal gram dal (1g). Whole horse gram and Toor dal also have rich fiber content (5g).[10] *Hordeum vulgare, Oryza sativa, Triticum sativum*, Green gram, Toor dal, fenugreek, onion, garlic, gooseberry, Jamun etc. are recommended to diabetics by modern researchers too.[11] Of interest, many reports proved the advantages of vegan diet for reduction in diabetes incidence,[12] its ability to improve insulin resistance being well established.[13]

Honey is a sweet but highly nutritive natural product. Is it beneficial or detrimental in diabetes? Honey supplementation alone or in combination with antidiabetic drugs has been found to reduce hyperglycemia in rodents and humans with diabetes mellitus. However, the mechanisms of the hypoglycemic effect of honey remain unclear. The possible roles of fructose, mineral ions (such as zinc, copper and vanadium), phenolic acids and flavonoids have been suggested. The protection of the pancreatic beta cells against oxidative stress and damage (via honey antioxidant molecules such as organic acids and phenolic compounds) is one such potential mechanism.[14] This supports the Ayurvedic recommendation to use it alone or mixed with water in diabetes.

Life style modifications : Role of *Viharas*

Judicious physical **exercise** improves total food and carbohydrate tolerance and reduces the need for insulin. Excessive exercise is always contraindicated. Thirty minutes walk daily results in weight loss, maintain healthy blood pressure and cholesterol levels. Thus it reduces the risk of developing diabetes. Exercise causes muscle contraction that pushes the sugar inside the cells even if one is insulin resistant.

Susruta explained a walk of 100 *Yojanas* (800 miles) in 100 days i.e. one *Yojana* per day (1 Yojana~ 7.5km).[15] A study reported that a daily brisk walk of 7.5km (brisk - is walking with speed of at least 5km/hr) for 100 days can reverse Glucose Tolerance Test to normal.[18],[19] Physical activity has been shown to reduce hyperinsulinemia and improve peripheral insulin activity in 65 year old subjects,[20] which shows that even at this age, chronic diseases can be fought through a better lifestyle.

Regular practice of ***Yogasanas*** like *Surya Namaskara*, *Pranayama* etc. are also beneficial in preventing diabetes. Breathing is an involuntary process controlled by medulla oblongata which get stimulated by carbondioxide content in the blood. Both the lungs have about 700 million alveoli, which facilitate ready exchange by diffusion of oxygen and carbon dioxide into or out of alveoli. Normal diffusion is about only 350ml but during *Pranayama* it reaches upto 3000ml of air. Therefore, oxygen can be pumped in with the help of the blood to all the cells and tissues in the body. Increased oxygen availability at a cellular level can be helpful in the management of complications caused by microangiopathy in diabetic patients.

Other ***Viharas*** include intense massage, affusiones and application with fragrants like *Twak*, cardamom, *Agaru* and sandalwood. Wrestling, active sports, riding on a horse or elephant, long walks, archery and throwing javelins.[17] Regular swimming and dancing. A quotation '*Nihsukhatva Sukhaya Cha'* in *Kaphasya Upakrama* mentioned by *Vagbhata* is very appropriate for preventing type 2 diabetes, which means withdrawing of luxury to create happiness.[16]

CONCLUSION

Improper lifestyle plays an important role in the development of type 2 diabetes. In high risk peoples along with drug interventions, emphasis must be given to socioeconomic, behavioral and nutritional issues which will promote a healthier lifestyle (in order to increase compliance to the lifestyle

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modifications) especially for 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 *Yoga* in daily routine. Maintaining physical wellbeing, mental tranquility and sanctity is equally crucial.

REFERENCES

1. Mukesh Edavalath. Role of Ayurvedic dietetics in the prevention and management of Diabetes Mellitus: A review Vaidyaratnam P S Varier Ayurveda College, India, 23rd International Conference on Herbal and Alternative Remedies for Diabetes and Endocrine Disorders, November 02-04, 2017 Bangkok, Thailand.
2. Kasper DL, Fauci AS, Hauser S, et al, editors. Harrison's principles of internal medicine, 19th ed.
3. Acharya YT. Charaka Samhita, Sutra Sthana, ch.6, ver. 4-46, Reprint edition, Chaukhambha Orientalia,Varanasi, pp 445-46, 2004.
4. Acharya YT. Charaka Samhita, Vimana Sthana,ch. 1, ver. 21, Reprint edition, Chaukhambha Orientalia,Varanasi, pp 235, 2004
5. Acharya YT. Charaka Samhita, Sutra Sthana, ch.7, ver. 41, Reprint edition 2004, Chaukhambha Orientalia,Varanasi, pp 52, 2004
6. Acharya YT. Charaka Samhita, Nidana Sthana,ch. 4, ver. 36-52, Reprint edition, Chaukhambha Orientalia, Varanasi, pp 215, 2004
7. Acharya YT. Charaka Samhita, Chikitsa Sthana, ch. 11, ver. 11-12, Reprint edition Chaukhambha Orientalia, Varanasi, pp 449, 2004
8. Burkitt DP, Trowell H. Refine carbohydrate foods and diseases. Academic Press, New York, pp 35,1975.
9. Acharya RK, Upadhyay BN, Dwivedi LD. Dietary management in *Prameha*. *Anc Sci Life* 1996; 15:176- 189.
10. TNAU Agritech Portal, Post harvest technology. Available from: http://agritech.tnau.ac.in/postharvest/pht_pulses.html.[La st accessed on 2014 Feb 27].
11. Mushtaq A, Rahmatullah Q, Muhammad A, Mir AK, Muhammad J. Traditional herbal remedies used for the treatment of diabetes from district Attock (pakistan). *Pak J Bot* 41: 2777-2782, 2009
12. Kahleova H, Hrachovinova T, Hill M, Pelikanova T. Vegetarian diet in type 2 diabetes-Improvement in quality of life, mood and eating behavior. *Diabet Med* 30: 127-9, 2013.
13. Kahleova H, Matoulek M, Malinska H et al.Vegetarian diet improves insulin resistance and oxidative stress markers more than conventional diet in subjects with Type 2 diabetes. *Diabet Med* 28: 549-59, 2011
14. Erejuwa OO, Sulaiman SA, Wahab MS.Honey–a novel antidiabetic agent. *Int J Biol Sci* 8: 913–934, 2012.
15. Acharya YT. Sushruta Samhita, Chikitsa Sthana,ch. 11, ver. 6-12, Reprint edition, Chaukhambha Krishanadas Academy, Varanasi, pp 449-450,2004.
16. Paradakara HS. Astanga Hridaya, Nidana Sthana, ch. 10, ver. 1-16, Reprint edition, Chaukhambha Sanskrita Sansthana, Varanasi, pp 502-503,2010
17. Acharya YT. Charaka Samhita, Sutra Sthana, ch.6, ver. 4-46, Reprint edition, Chaukhambha Orientalia,Varanasi, pp 445-46, 2004
18. Diabetes Prevention Program Research Group.Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* 346: 393-403,2002.
19. Pan X, Li G, Hu Y, Wang J, Yang W, An Z.Effects of diet and exercise in preventing NIDMM in people with impaired glucose tolerance. The Da Qing IGT and Diabetes Study. *Diabetes Care* 20: 537-544, 1997
20. Zierath JR, Wallberg-Henriksson H. Exercise training in obese patients. Special considerations. *Sports Med* 14: 171-189, 1992.

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