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RESEARCH ARTICLE

CLINICAL DIETETICS IN TYPE 2 DIABETES MELLITUS.

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Abstract

Diabetic Mellitus (DM) refers to a group of common metabolic disorders that has a main characteristic feature of hyperglycemia. According to the latest data from the World Health Organisation, Globally about 422 million adults are living with Diabetes Mellitus. The management of Diabetes mellitus includes proper dietary regulations, exercise regimen, hypoglycemic drugs and prevention of degenerative complications. Medical nutrition therapy (MNT) is one of the corner stone in diabetes care and management. In Ayurveda, Diabetes mellitus is a metabolic disease of multiple etiologies and is described as Madhumeha in Ayurvedic literatures. When a person with sedentary life style takes food with Seeta, Snigdha, Madhura, Medovardhaka and Dravapradhana in excess becomes a patient of Prameha. This article is an overview of Classical Ayurvedic practices in Prameha Chikitsa to modern clinical dietetics in Diabetes mellitus.

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Introduction:-

Diabetic Mellitus (DM) refers to a group of common metabolic disorders that has a main characteristic feature of hyperglycemia. Diabetes is characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. Diabetes mellitus affects more than 62 million Indians, which is more than 7.1% of India's Adult Population. The prevalence of Type 2 DM is rising much more rapidly, because of increasing obesity and reduced activity levels. The disease is associated with reduced quality of life and increased risk factors for mortality and morbidity due to specific diabetes related microvascular and macrovascular complications.

Management of Diabetes:-

A multidisciplinary health care team must be needed for the care of an individual with diabetes. It should include the primary care provider and/or the endocrinologist or diabetologist, a certified diabetes educator, a nutritionist, and a psychologist. When diabetes related complications arise, subspecialists with experience in DM-related complications are essential. But the ultimate success depends on the patient's participation, input, and enthusiasm.

Proper management of diabetes concentrates on keeping blood sugar levels as close to normal ("euglycemia") as possible, during most part of the day and thereby delaying clinical complications and thus conferring clinical normalcy. The aim of treatment is to, eliminate symptoms due to hyperglycemia, reduce or eliminate the long-term complications of diabetes and allowing the patient to lead a normal a lifestyle. In short, the management of Diabetes

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mellitus include, 1) Proper dietary regulations 2) Exercise regimen 3) Hypoglycemic drugs and 4) Prevention of degenerative complications.

Medical Nutrition Therapy (Mnt):-

Diet control is the corner stone in diabetes care and management. Medical nutrition therapy is the optimal coordination of caloric intake with other aspects of Diabetes therapy like insulin, exercise and weight loss which is described by the ADA. Three levels of prevention can be done in MNT.

1) Primary prevention

It is directed at preventing or delaying the onset of type 2 DM in high-risk individuals (obese or with prediabetes) by promoting weight reduction.

2) Secondary prevention

It aims at preventing or delaying diabetes-related complications in diabetic individuals by improving the glycemic control.

3) Tertiary prevention

Tertiary preventions of MNT are directed at managing diabetes related complications (cardiovascular disease, nephropathy) in diabetic individual.

A diabetic patient is advised to take a balanced diet with high protein content, low calories, devoid of refined sugars and low saturated fat, adequate PUFA, low cholesterol and sufficient quantities of fibre. Vegetables are the main source of minerals, vitamins and fibre. The glycemic index is an estimate of the post prandial rise in the blood glucose when a certain amount of that food is consumed. The goals of MNT in Type 2 DM should focus on weight loss and address the increased prevalence of cardiovascular risk factors (hypertension, dyslipidemia, obesity) and disease in the population.

Ayurvedic Perspective:-

Ayurveda, the science of life has ample description about the syndrome 'Prameha'. It is considered as one among Ashtamahagadas and is anushangi in Nature. Diabetes mellitus is a metabolic disease of multiple etiologies and is described as Madhumeha in Ayurvedic literatures.

According to Charaka, even though Tridoshas are involved in the manifestation of Prameha, 'Kapha' is the main dosha involved in all types of pramehas. According to Charaka 'Bahudrava Sleshma' is the bhava of Kaphadosha in Prameha. Madhuradi guru aharas in excess cause the aggravation of Kapha dosha and the vitiated Sleshma with Kleda, Meda etc cause prameha. When a person with sedentary life style takes food with Seeta, Snigdha, Madhura, Medovardhaka and Drava pradhana in excess becomes a patient of Prameha. According to Acharya Vagbhata all types of foods, drinks and activities which are responsible for increase in Kapha, Medas and Mutra are the causative factors of Prameha. Acharya Charaka mentioned it as Santharpanajanya Vyadhi. In general sedentary life style and Kaphakara aharas are the causative factors of the disease.

Management aspect as per Ayurvedic Classics:-

Multidisciplinary team mentioned by American Diabetic Association can be correlated to the "Padachathushtayas-bhishak, dravya, aushadha and rogi"- mentioned by Ayurveda Acharyas. Also while considering the Medical Nutrition Therapy, the Primary prevention which aims at preventing or delaying T2 DM in high risk individuals can be related to the 'Pathya mentioned in Prameha Chikitsa for adhana' (having no money) as "—adhana: chatrapadatararहितो मुनिवर्तना: ... योजनानामसतम्ययात, ---"ie, he should go on walk for 100 yojana without an umbrella and footwear, adhering to the way of life an ascetic or dig a reservoir of water by himself or wander along with herd of cows sub sting on the dung, urine etc. Secondary prevention oriented in preventing diabetes related complications can be equated to 'Prameha Pathyas'-low Glycemic index food items like "---yavanamvikriti---"etc. Tertiary prevention measures of managing DM with complications can be equated to intake of 'Rasayana drugs' like Silajatu-"Silajatutulam---".

Classical ayurvedic dietary guidelines:-

1. Based on body constitution of person.
2. For Sthula - Apararpana diet.

3. For Krisa – Santharpana diet (amedomutrala).
3. Based on Prameha Nidana.
4. Based on Prameha Pathyas.
5. Based on Ashtavidhivishesha Ayatana.

All the diabetic guidelines should follow Astavidhivishesha ayatana mentioned in Charaka Samhita and it comprises of 8 factors. They are Prakriti (nature of the food articles), Karana (method of their processing), Samyoga (combination), Rasi (quantity), Desa (habitat), Kala (time, stage of disease or the state of the individual), Upayogasamstha (rules governing the intake of food) and Upayoktha (wholesomeness to the individual who takes it).

Dietary applications-a comparison between Ayurvedic and Modern perspective :

Dhanya varga-Cereals-Figure-1

Ayurveda	Gunas-classics	Modern
Godhuma (300 kcal) (GI-50-70)	Vrshya, jeevana, sandhanakrit, sthairyakrit	Triticum aestivum - antioxidant, antidiabetic.
PuranaSali (329 kcal) (GI-89)	laghu, vrshya	Oryza sativa. Rice bran-25% fibre, vit E, antioxidant, and antidiabetic effect, laxative.
Mudga-simbidhanya (318 kcal)	Laghu, medosleshmaharam	Vigna radiata-carbs show slow effect of blood glucose level.
Trnadhanyas-kodrava(ragi) (296 kcal)	Laghu, lekhanam kaphapithaharam, seeta	Ragi-polyphenol, dietary fibre- antidiabetic, antioxidant, calcium and iron.
Yava	Sara,ruksha, vrshya, sthairyakrit, mutrmedavikarajit	Hordeum vulgare-antioxidant, low calorie, high fibre.
Puranashashtika	Laghu, stairyakrit	Oryzasativa, antidiabetic effect

Saka Varga-Vegetables- Figure 2

Tiktasaka	Guna -classics	modern
Patola-snake Gourd Trichosanthes cucumerina	Tikta rasa, seeta, hrnya, kriminut	antibiotic, laxative, cooling Low calorie, antidiabetic, used in heart diseases.
Karavelam-bitter Gourd	Sa Katukam deepanam kaphajit param	Momordica charantia-proven antidiabetic drug
Vartaka-brinjal	Kaphaharam	Antidiabetic property
Brhati	Deepanam, bhedi	SOLANACEAE family-Antidiabetic property
Kantakari		Antidiabetic
Tanduleeyam-Amaranthus spinosus (10 kcal)(GI-15)	RUKSHA	Amaranthus species-antidiabetic, anticholesterolemic
Palakya-spinach	SARA	Antidiabetic

Phala Varga-Fruits -Figure 3

Ayurveda		Modern	GI
AMALAKI-Emblica officinalis	Vayahstapani	Cherry	22
	Chakshushya	Gooseberry	25
	Ayushya	Apple	38
	Saram	Black plum(Jambu)	39
	Vrshya	Orange	44
	Mehajit	grapes	46
	anti oxidant,	Banana	54

	Vit C antidiabetic	Mango	56
		Papaya	60
		Pineapple	66

Mamsa Varga-Ayurveda -Figure 4

Soolyamamsam	
Jangalamamsam	
Viskira(scratch earth for food)	Tamrachuda(cock) kukkuda

Mamsa varga-Modern –Figure-5

Fish high omega 3 fatty acid. (salmon,sardine,tuna)

Ayurvedic Drinks-Figure-6

Sarodaka
Kusodaka
Triphala rasa
Asanadi sarambu
Sidhu,madhvika
Takram, amla khalam, ragam (acidic food-decrease GI)

Modern drinks-Figure-7

Unsweetened tea.
Unsweetened coffee.
Skimmed milk.
Moderate alcohol.
Low calorie drinks.

Diabetic diet chart -Figure 8

Meal	Food types
Early morning	1 cup of coffee or tea without sugar 2 Marie biscuits
Breakfast	1 cup of milk without sugar. 3 idlis with chutney or 2 dosas or 2 cups of upumao 2 small idyappams or 2 slices of bread. 2 egg whites. Choose from: a medium sized apple, pear, orange or a medium slice of papaya or 10 grapes.
Midmorning	Choose from: a medium sized apple, pear, orange, guava or a medium slice of papaya or 10 grapes.
Lunch	1 cup of rice or 2 medium chapatis, 1 cup of sambhar with ½ part vegetables and ½ part dal or 1 piece (30g) of fish or chicken; 1 cup leafy or gourd type vegetables (spinach, bottle gourd, ridge gourd, snake gourd). 1 cup of other vegetables (cauliflower, carrot, capsicum, pumpkin, green beans, brinjal or lady's finger). 1 glass of butter milk. 1 ½ tsp of oil.
Evening	1 cup of tea or coffee without sugar. 2 cracker biscuits
Dinner	2 medium chapattis or 1 cup of rice. 1 cup of dal or sambhar with ½ part vegetables. 1 cup of cooked vegetables (½ part leafy vegetables). ½ part other vegetables; not tubers or roots. 1 cup of salad (½ cucumber +½ onion, carrot or radish). Choose from: a medium sized apple, pear, orange, guava or a medium slice of papaya or 10 grapes.
Bedtime	1 cup of milk without sugar.

Conclusion:-

On close examination we can see that the Antidiabetic dietary regimen and exercises suggested in Samhitas has been proven scientifically in present era with minimal controversies. With conventional therapies managing diabetes may

not always be easy, but with Ayurvedic management one can stay healthy with benefits of a personalized treatment plan, diabetes-friendly diet and lifestyle.

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