



LIFESTYLE INTERVENTION IN TYPE 2 DIABETES MELLITUS

INGOLE AKANGKSHA G., PATHAN ADIBA M., KELGAONKAR PRAJAKTA N.

SHIVLINGESHWAR COLLEGE OF PHARMACY, ALMALA, LATUR, MAHARASHTRA, INDIA- 413512.

ABSTRACT:

Now a days, type 2 diabetes mellitus is one of the most common disorders found worldwide. Type 2 diabetes mellitus is considered as group of metabolic disorder in which patient develops a chronic hyperglycaemic condition due to abnormal insulin sensitivity. It is caused by combination of genetic factors and environmental factors such as age, diet, smoking, race, ethnicity etc. The global prevalence rate of diabetes is estimated to be 9.3%. The greater prevalence rate of diabetes is now become a major problem.

Sedentary lifestyle and unbalanced dietary habits increases the risk factor for type 2 diabetes mellitus. Lifestyle Interventions improves standard of living for prevention of type 2 diabetes mellitus which includes proper diet, physical activity, yoga asanas, maintenance of weight and use of herbal medicines like fenugreek seeds, tulsi leaves, bitter melon etc. which may reduce the risk.

KEYWORDS: type 2 diabetes mellitus, metabolic disorder, hyperglycaemic condition, risk factor, lifestyle interventions, insulin sensitivity.

INTRODUCTION:

In 21st century the Urbanization and economic development is growing rapidly with change in environment. The healthcare disorders like diabetes are also increasing drastically on global basis. As we are in developing stage of country our changing lifestyle to modernize ourselves like change in pattern of diet, physical activity, obesity, stress affecting people health gradually. Type 2 diabetes mellitus is interpreted by abnormal regulation of carbohydrate, lipid and Protein metabolism and appear from impaired insulin Secretion or insulin resistance or a amalgamation of both. In type 2 diabetes mellitus there is a chronic hyperglycaemia. In most developed countries diabetes is the fourth or fifth leading cause of death. 90% of all cases are of the type2 diabetes mellitus. The principle cause of type 2 diabetes mellitus is gradually impaired insulin secretion by pancreatic b-cells, usually upon a background of previous insulin resistance in skeletal muscle, liver and adipose tissue. In healthy state after having food metabolism is started thus insulin secretion is provoked and glucagon secretion is inhibited by the amalgated actions of hyperinsulinaemia and hyperglycaemia. The incretin hormones Glucagon like peptide 1 (GLP1) and Gastric inhibitory polypeptide (GIP) which are gut peptides secreted by L cells and k cells in gut respectively controlled the 60-70% of insulin secretion. Suppression of hepatic glucose production, stimulation of muscle glucose uptake and inhibition of lipolysis occurs due to collection of changes in glucose, insulin and glucagon levels and these all increases the effect of insulin on liver and muscles.

Thus type 2 diabetes mellitus is analogous to following major agitation in physiological response:

- Insulin secretion is disabled.
- Enhancement in level of fasting plasma glucagon and unable to reduced normally after a meal.
- Muscle glucose uptake is damaged.
- Basal hepatic glucose production is raised and inadequate to suppress normally after a meal.
- Fasting plasma free fatty acid levels are also enhanced and insufficient to reduce level normally after a meal.
- Post meal increased in glucagon like peptide 1 & gastric inhibitory polypeptide is usual or quiet decreased.

So, overall there is a development of b-cell resistance to the stimulatory effect of glucagon like peptide 1 and gastric inhibitory polypeptide on insulin secretion. prediabetes come before hyperglycaemia with a high risk condition to develop type 2 diabetes mellitus. 3% to 11% per year is the annual conversion rate of prediabetes to type 2 diabetes mellitus. Prediabetes is distinguished by impaired glucose tolerance (IGT) or raised glycated haemoglobin A1c (HbA1c) levels. Type 2 diabetes mellitus appears to be a polygenic and multifactorial disorder because the disease expression depends on multiple gene loci in that genes interact with the environmental influences.

It is also occurs due to genetic factors or acquired factors like lifestyle, diet, exercise and obesity which play important role in developing type 2 diabetes mellitus. lifestyle changes obviously make susceptible condition to development of obesity and it is the major factor in the origination of diabetes. Also the Risk factors for type 2 diabetes mellitus includes old age, family history of type 2 diabetes mellitus, increased blood pressure, waist circumference, high plasma triglyceride levels, low plasma high density protein, abdominal or central obesity, polycystic ovary syndrome, history of atherosclerosis, cardiovascular disease, unhealthy dietary factors, cigarette smoking, sedentary lifestyle, hyperpigmentation of skin, some medication, rotating shift work, irregular sleep duration. At the time of diagnosis most of the patients remain asymptomatic. Prevention of diabetes require proper diagnosis of disease. Patients who have Prediabetes can be curable with lifestyle interventions like weight loss and exercise. Patients at high Risk of diabetes can be treated with Metformin, Pioglitazone and combined low dose metformin and Rosiglitazone are also effective in prevention of type 2 diabetes mellitus from Prediabetic state. Type 2 diabetes mellitus is a complex disorder that needs a proper medical care, self management education, lifestyle intervention and also reduction strategies to minimize the microvascular and macrovascular complications such as retinopathy, nephropathy, neuropathy and heart attack, stroke respectively.

The main components of diabetic therapy other than medications are:

Physical activity increase insulin sensitivity in diabetic patient:

It has been advised that physical activity increases insulin sensitivity. According to Health and human Services USA, 2015 published Report, it is said that physical activity immensely improved abnormal glucose tolerance. Physical activity is likely to be most advantageous in prevention of type 2 diabetes mellitus during initial stages. It has shown a synergistic effect with insulin. During physical activity, contraction of skeletal muscle increases glucose uptake into cell. Physical activity has also been found to reduce intra-abdominal fat or weight loss in obese patients which is a risk factor for development of insulin resistance. Type 2 diabetes mellitus patients are encouraged to enhance physical work because it may reduce hyperglycaemia, body fat and improve protection against cardiovascular or renal complications. The proper type, frequency, intensity, duration of exercise for achieving goals in type 2 diabetes mellitus is not well known. The aerobic exercises like brisk walking, cycling, swimming, jogging in which muscular and cardiorespiratory System are involved can be performed on regular basis. Resistance training enhances muscle strength.

Yoga asanas are beneficial for physical as well as mental health:

Yoga based interventions can be used for prevention and treatment of type 2 diabetes mellitus. It is a cost-effective treatment free of any side effects. More than 4000 years ago yoga is introduced in India. Yoga has been performed to decrease stress and develop relaxation in body. Padma asana (lotus pose), Dhanurasana (Bow pose), Paschimotana asana (forward seated bend pose), Mayur asana(peacock pose), Shalabh asana (locust pose), Pranayama and Shatkriyas (cleansing exercises) like Dhauti, Basti, Neti, Tratak, Kapalabhati, Yoga Nidra

(relaxation) are some examples of yoga asana's may performed by individual for prevention of type 2 diabetes mellitus. Yoga asana's are of low physical impact but relieve bodily strain and relax the mind.

Padmasana: It is a cross legged yoga posture which includes meditation and calm the mind. The overall posture is just like lotus. It improves digestion, relaxes mind and reduces muscular tension.

Dhanurasana: Dhanurasana strengthen the back and abdominal muscles and also tones leg and arm muscles. It reduces stress and fatigue.

Paschimotana asana: It increases physical flexibility and brings mental calm.

Mayurasana: It is a peacock pose which strengthen your core, chest, arms, thighs and back. It also tones the digestive organs.

Shalabh asana: It enhances blood circulation and also useful in stomach diseases and helps in reduction of weight. It is a locust pose yoga asana.

Pranayama: It is a yoga practice of controlling your breath which connects the body to the mind. Improves oxygen supply to body and remove toxic substances form body.

Kapalabhati: It removes waste material from body. It activates the brain cells and improves concentration and memory power.

Yoga Nidra: It is a relaxation of body.

Shatkriyas: It maintains good health, reduces anger and depression and relaxes mind.

Diet modifications in day to day life:

It is observed that the disease is almost confined to rich people who consumed oily foods, flour and sugar in large amounts. Few studies also show strong relation between high intake of Carbohydrates and fats with type 2 diabetes mellitus. Also, high intake of soft drinks and cold drinks increase the obesity because it contains high amount of fructose which eventually raises the blood sugar level and Body mass index (BMI) to harmful level. It is seen that not only volume or amount of food but also the composition and quality of food affect the health and thus increases obesity. Also, the high intake of white rice, red meat, sweets, fried foods increases the risk of type 2 diabetes mellitus. This requires an urgent necessity of lifestyle modification among general population and also need to increase awareness of healthy diet pattern in all groups.

It is observed that consumption of vegetables and fruits are considered as protective barrier against disease as they are rich in Nutrients and Antioxidants. In management of diabetes Nutrition is very much important because not only type of food but also quantity of food influences blood glucose level. The Dietary approaches to stop hypertension (DASH) diet includes fruits, vegetables, low fat milk products, whole grains, fish, poultry, nuts, lean red meat and limited intake of sugar and sweets. All diabetic patients must follow a proper diet plan which includes the leafy greens vegetable like Spinach which is low in calories but rich in several vitamins and minerals like vitamin c. Cinnamon has strong antioxidant properties and improves insulin sensitivity as well. A diabetic patient can include fishes like Salmon, sardines and mackerel in diet. The fatty fishes Contain omega-3 fatty acids. Chia seeds are rich in fiber helps to decrease blood pressure and inflammatory markers. Greek yogurt, blueberries, flaxseeds, nuts, garlic and strawberries should be included in diet plan. Yogurt contains probiotics which reduces further complications of diabetes. 30gram of walnuts may be consumed by individual daily due to its richness in fibers. Nuts and garlic reduces the inflammation and low density lipoprotein (LDL) levels or bad cholesterol level in type 2 diabetes mellitus.

Diet plan for type 2 diabetes mellitus:

Breakfast : Egg, Avocado, Orange, Oats, Blueberries, Almonds, Chia seeds, 2 Egg omelet including Spinach, Mushrooms, Bell pepper, Avocado, Black Beans, Sweet potato, Flaxseeds, Unsweetened almond milk, Greek yogurt with mashed Banana, Detox water with soaked Cumin seeds or Fenugreek seeds or Fennel seeds, Hot water, Oatmeal with nuts or fresh fruits, Herbal tea, Daliya with almond milk or fruits or vegetables, Upama, Seasonal fruits or vegetables, Green tea, Roasted chana, Lightly fried multigrain parathas, Moong dal chila, Mint chutney, Coconut chutney, Pear, Apple, Papaya, Idlis, Sambar, Buttermilk.

Lunch: 1 Grilled Chicken Breast, Chickpeas, Carrots, Whole grain bread, Tomato, Raw Cauliflower, Salad, Cucumber, Leafy Green Vegetables, Multigrain rotis, Moong sprouts, Curd, Low Fat Paneer, Brown rice, Bajra roti, Buttermilk, Tofu, Chana sprouts, Sambar, Multigrain dosas, Coconut chutney, Multigrain uttapams.

Snacks: Baby carrots, Hummus, Greek yogurt with Banana, Cherry tomato, Almonds, Buttermilk, Orange, Sandwich, Green tea, Sugar free oats cookies, Herbal tea, Puffed rice, Upama, Green tea.

Dinner: Lentils, Tomato soup, Cooked asparagus, Basil, Steamed Broccoli, Pineapple, Olive oil, Baked potato, Salmon filet, Strawberries, Shrimp, Spinach, Paneer, Multigrain rotis, Brown rice, Salad, Lentil soup, Leafy Vegetables, Chicken, Chickpeas, Multigrain bread, Hummus, Mustard saag, Bajra rotis, Soya, Karela, Yellow dal without tadka.

Contraindicated food in type 2 diabetes mellitus:

Potatoes or squash or other root vegetables due to starch content, Refined carbohydrates such as white bread, Flour, Sugary and Highly processed foods and Beverages, Packaged snacks, Beef, Dark meat chicken, Whole milk, Butter, Cheese, Sour cream, Candy, Cookies, Ice cream, Desserts, Juice, Soda, Sweet tea, Table sugar, Brown sugar, Honey, Maple syrup, Chips, Microwave Popcorn, Processed meat, Fried foods.

Herbs useful in diabetes mellitus:

Fenugreek seeds: Fenugreek seeds soaked in overnight water or in powdered form with buttermilk is taken as detox water early morning. The chemical ingredients present in fenugreek seeds is Trigonelline which slow down digestion and absorption of carbohydrates and eventually reduces the blood glucose level. It is rich in fiber and improve metabolism.

Bitter melon (karela): The karela has immense importance in diabetes because it is high in anti diabetic properties. It contains charantin, vicin and polypeptide p, lectin by acting on peripheral tissue and suppressing the appetite. It is also rich in vitamin a, b1, b2 and c, iron and it also prevents further complications.

Jamun seeds: The powder of jamun seeds can be consumed with water or buttermilk. The chemical ingredient present in jamun seeds is jamboline which decrease the quantity of sugar in urine and controls limitless thirst and also conversion of starch to glucose.

Bael leaves: Fresh juice of bael leaves with pinch of pepper in early morning is highly beneficial in controlling the high blood glucose level.

Fig leaves: Chewing of figs leaves empty stomach early morning or boiling in water shown high anti diabetic properties.

Mango leaves: Soaked mango leaves or in powdered form with water in early morning helpful in type 2 diabetes mellitus.

Neem leaves: It has antidiabetic, antioxidants, anti-inflammatory properties. Its leaves and bark is used as medicine.

Clove: Clove reduces the bad cholesterol and triglycerides levels and improve insulin sensitivity. It also has antioxidant and digestion improving properties.

Tulsi leaves: It is a traditionally used ayurvedic herb beneficial in diabetes because it increases functions of b cells and improve insulin sensitivity.

Garlic: Garlic shows hypoglycaemic effects and reduces cholesterol levels in body, because of allicin present in it has anti diabetic effect.

Self management education:

Diabetes Mellitus can be managed by improving patient dietary knowledge, attitudes and practices about disease. Diabetes self Management education is necessary for assessment of self high or low Blood glucose level. Also self care of foot is imperative to elude infections which lead to amputation. With Regard to changing lifestyle smoking and alcohol cessation is an essential step of diabetes self care. Patient meal should contain food with low fat, low carbohydrate and high fiber. Medication adherence, increasing physical activity, reduction in intake of dietary fat and calories are also included in self management of diabetes.

CONCLUSION:

It is crystal clear that there is a worldwide epidemic of diabetes due to changes in lifestyle, enhanced longevity and obesity. The widespread presence of diabetes cause large burden economically and also increases its further complications. Early detection and management of disease may reduce the complications of diabetes. The primary prevention of type 2 diabetes mellitus is promoting a healthy lifestyle. Diabetes mellitus is a disease for lifelong which demands proper Pharmacologic therapy, Dietary management, Health Professionals, Special emphasis on diet to control progression of disease and most important prevention of complications. The healthcare providers should have genuine familiarization about cultural beliefs, thoughts, family and communal Networks of the patients. Physical activity, weight control and diet should be the fundamental principle of type 2 diabetes mellitus.

ACKNOWLEDGMENT: N/A

SOURCE OF FINDING: N/A

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