

EXERCISE ADDED WITH REGULATED NUTRITION (EARN) – THE RIGHT WAY OF LIVING.

A PREVENTIVE APPROACH TO TYPE 2 DIABETES MELLITUS

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ABSTRACT : Lifestyle changes,urbanization and physical inactivity predispose an individual to the risk of Type 2 Diabetes Mellitus.Regular physical activity and regulated nutrition would prevent or delay the early onset of Diabetes.There is direct relationship between physical activity and metabolic health.Data indicate that 150 minutes per week of moderate to vigorous intensity physical activity brings significantly lower risks.Foods rich in soluble fiber can help lower blood cholesterol levels,enhance digestive health and minimize the rise in blood sugar levels after a meal.

Introduction

The number of people with diabetes is increasing due to population growth, aging, urbanization and increasing prevalence of obesity and physical inactivity. Obesity along with Type 2 Diabetes has become a health problem of epidemic proportions, both in developed and developing countries. The pace of increase of both obesity and Diabetes is due to socio economic transition leading to surplus of food combined with marked decrease in physical activity. These conditions are conducive to the development of Diabetes “The function of protecting and developing health must rank even above that of restoring it when it is impaired.” *-Hippocrates*

Exercise and Weight

Exercise refers to a form of regular physical activity ranging from Moderate (fast walking) to Vigorous Activity (Jogging or running) carried out consistently by an individual over a period of five days a week (45 min/day for Moderate and 30 min/day for Vigorous activity).Regular physical activity can help the human body maintain repair and improve itself to an amazing degree. The researchers at the Dana – Farber cancer Institute and Harvard Medical School provided remarkable new insights into how exercise affects the body at a cellular level. A substance called PGC 1 – alpha – a newly discovered hormone produced in response to exercise may be turning people white fat brown, and in the process lessening their susceptibility to obesity, diabetes and other health problems. Studies estimating the amount of physical activity required to lose and maintain body weight typically encourage subjects to expend 1000 to 1500 kcal/wk

Physical activity and Glycemic Control

During physical activity glucose levels fall as a result of insulin stimulated glucose uptake by the exercising muscle cell. Repeated bouts of exercise results in both improved fasting and postprandial insulin and glucose levels. This exercise induced improvement in insulin sensitivity is the result of enhanced glycogen storage in muscle and reduced insulin resistance from mobilizing intramuscular fat. Reduced insulin resistance is by far the most important benefit of physical activity in terms of glucose tolerance and metabolic control and is thought to be responsible for the strong relationship between regular physical activity and reduced risk for developing Type 2 Diabetes.

Health Benefits of Physical activity

- Increased strength of the heart muscles
- Increased flow of blood to the heart
- Increased bone mass and resistance to osteoporosis

- Decreased amount of fat in the Blood
- Decreased heart rate
- Increased longevity
- Maintenance of normal blood pressure and reduction in blood pressure in people with hypertension
- Maintenance of body weight within generally accepted normal limits
- Prevention and alleviation of chronic low back pain
- Improved sleep
- Greater energy reserve for work and recreation
- Improved posture, which leads to improved physical appearance and the ability to withstand fatigue
- Greater ability of the body to cope with illness or accidents
- Exercise increases the size of coronary arteries and reduces clogging due to atherosclerosis
- Exercise also increases the efficiency of blood's oxygen carrying capacity and muscle's uptake of oxygen.
- Exercise has been linked to increased levels of high density lipoprotein (Good) Cholesterol and decreases low-density lipoprotein (Bad) Cholesterol and triglyceride levels.

Psychological Benefits of exercise

- Regular physical activity can result in periods of relaxed concentration, characterized by reduced physical and psychic tensions, regular breathing rhythms and increased self – awareness.
- Exercise becomes a means for autohypnosis, which increases the tendency for creative visualization
- Exercise increases the body's output of epinephrine, which produces feelings of euphoria
- Exercise changes the pattern of the secretion of brain neurotransmitters, particularly nor epinephrine which produces changes in mood.
- Exercise increases the secretion of endorphins and enkephalins -hormone, like substances that can facilitate feelings of inner peace.

Nutrition and Energy Requirements

Energy intake is generally episodic, varying in carbohydrate, protein, and fat intake from meal to meal and day to day daily caloric or energy requirement is determined by daily energy expenditure. This is represented by the sum of calories required to meet the needs for Resting Metabolic Rate (RMR) the Thermic Effect of Food (TEF) and Thermic Effect of Exercise. RMR comprises 60% to 75% of Daily caloric needs and depends on age, Gender body composition and genetics. Approximately a 2% to 3% Drop in RMR occurs for every decade of life. Men have a higher RMR and require more calories than women because of their larger size and greater muscle mass.

Diabetes and obesity

There has been a transition in life style, diet and food habits over the last decade. A hectic life style and the easy availability of convenience foods have led to an imbalanced diet, irregular meals and frequent snacking on fast foods with low nutritional value including ready to use gravies and soups, packaged salty snacks and cooking rather than traditional home cooked food. Further consumption of animal foods, sweetened carbonated drinks, sugar and sweeteners has also increased. This has led to an alarming rise in obesity due to high consumption of calories, saturated fats, Transfatty Acids (TFA's) and Sugar.

Obesity defined as excess of body fat relative to weight is the sixth most important risk factor contributing to the overall burden of disease worldwide. Over weight refers to an excess body weight compared to set standards, which may come from muscles (lean Body mass), bone, fat (adipose tissues) some time tumors' and/or body water or rarely due to tumours. It is

observed that women have more body fat than men. Men with more than 25% total body fat and women with more than 30% total body fat are considered obese. Obesity particularly abdominal obesity is strongly linked to increased risk of Diabetes.

Evidence for the link between obesity and diabetes comes from the epidemiological and intervention studies with weight reduction as the main target. In the Chennai Urban population of Diabetes increased with increase in quartiles of Body Mass Index (BMI), the prevalence being 2.9%, 8.1%, 17.6% and 19.5 in the first, second third and fourth and quartiles of BMI respectively. Prevalence of diabetes in subjects with abdominal obesity was significantly higher compared to those without abdominal obesity (27.8% Vs 9.0%)

Regulated Nutrition and Healthy eating

Regulated Nutrition refers to the self disciplined nutritional practices of an individual in the food choices and dietary habits directed towards sensible weight maintenance. Experts from across the country from various fields including Nutrition, Medicine, Diabetes, Metabolism, Endocrinology, Cardiology representing medical institutions, Govt funded research institutions and Policy making bodies participated in the exercise to develop Asian specific dietary guidelines. New National Dietary guidelines for Indians fine tuned to suit the urban sedentary lifestyle, suggest a decrease in the consumption of saturated fat (<10% of total energy / day) eating complex carbohydrates (50-60% total Energy/Day cereals and pulses) high fibre food 25-40gm(Fruits and vegetables) increase in the consumption of proteins(Soya, whole grains and milk)optimal rate of Essential fatty (10-15% of total energy/day) and a decreased salt intake (5gm/day). The guidelines not only lay down recommendations for nutrition but also talk about quality and quantity of cooking oils, cooking methods, water intake alcohol intake, choice of foods while eating out, meal timings and gaps between needs and other dietary habits. In order to ensure optimal fat quality in Asian Indian diets use of two are more vegetable oils is suggested. Proper application of these guidelines will help curb the rising epidemics of the metabolic syndrome, diabetes and heart disease in Asian Indians.

Individualized Fitness and weight management program

Physical activity exercise and weight management are key components of a wellness lifestyle

Exercise- First Steps

Before you begin to plan your fitness program, you should make sure that exercise is safe for you. If you are male and under 40 or Female and under 50 and in good health, exercise is probably safe for you. If you are over these ages or have health problems, see your physician before starting an exercise program.

Overall Program Plan

1. Determine your current fitness status and activity level
2. Set goals – Goals can be specific or general short or long term.
3. Select activities
4. Set a target intensity, duration and frequency for each activity
5. Begin and monitor your program.

Nutrition

Nutrition is vitally important component of wellness. Diet influences energy levels, well being and overall health. Analyse current eating habits. Once you understand your nutritional needs and habits, you can make reasonable and healthy choices for weight management.

The Food Guide Pyramid

Use the Food Guide Pyramid as guide to daily Food choices. The pyramid is an outline of what to eat each day not a rigid prescription but a general guide that lets you choose a healthful diet that's right for you. It calls for eating a variety of foods to set the nutrients you need and at the same time the right amount of calories to maintain a healthy weight.

Food Groups and Recommended Servings

The recommendations of the Pyramid are based on serving size.

Food Group

Number of Servings

choices within the Food Group

* Milk, yogurt and cheese	2-3	Pick nonfat milk and yogurt over whole milk and regular yogurt Choose “Part Skim” or low fat cheeses
* Meat, Poultry, fish, dry beans, eggs and nuts	2-3	Trim the fat from meat and prepare it by broiling roasting or boiling
* Fruits	2-4	To increase your fiber intake, Choose whole fruits over fruit juices
* Vegetable	3-5	Choose dark green leafy vegetable and legume often. They are especially rich in vitamins and minerals
* Bread, Cereals rice and pasta	6-11	Choose foods with little fat or sugar Limit your consumption of baked goods(Cakes and Cookies)

Improving Food choices – Dietary guidelines.

They are organized under three messages, the ABC’s for Health

* Aim for Fitness

Aim for a healthy weight

Be physically active each day

* Build a healthy base

Let the pyramid guide your food choice

Choose a variety of grains daily, especially whole grains

Choose a variety of fruits and vegetables daily

Keep food safe to eat

* Choose sensibly

Choose a diet that is low in saturated fat and cholesterol and moderate in total fat.

Choose beverages and foods to moderate your intake of sugars

Choose and prepare feeds with less salt if you drink alcoholic beverages, do so in moderation

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