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Type 2 Diabetes and its Treatment

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Abstract

Type 2 diabetes is chronic disease that is spreading all over the world. In type 2 diabetes mainly there is less insulin production. It can be diet-induced and may also be associated with obesity. The body weight of a person increases due to more energy taken by the food, also the physical activity with less workout may lead to abdominal adiposity and finally the insulin resistance. Insulin resistance leads to the development of type 2 diabetes. The ratio of diabetic patients is increasing day by day. 90% of the total diabetic patients have type 2 diabetes. The risk of developing type 2diabetes is increasing according to an estimation of the American born in 2000 or later one of the three and some 50% members are expected to have type 2 diabetes.

Keywords: Type 2; Treatment; Insulin

Introduction

Type 2 diabetes is the metabolic disorder that occurs due to a high fiber diet that has more fat, protein, and sugar without proper exercise that results in overweight [1,2]. So regarding the treatment, the first suggestion given to the patient is to reduce the body weight either by diet control or by physical workout [3]. All this treatment through insulin therapy is mostly used by the patients. The treatment with basal insulin cannot be avoided in T2D patients while in some cases the only basal insulin is not sufficient for the patients to maintain the glycemic targets. It can be used either in the form of injections or in the form of pumps [4]. According to an estimation of 2017 than 425 million adults have diabetes and this will may reach to 628 million by 2045 [5].

Reasons for Type 2 diabetes

Pancrease is the main source for insulin production the hyperinsulinemia can be due to less insulin production from pancreas but the concentration of insulin precursor is high in the blood and pancreatic islets. In this disease the fats stored in the muscle, abdomen and other parts or lipids in the form of intramyocellular lipids (IMCL) which leads to less oxidation of muscle and finally insulin resistance. This all affects the functions of mitochondria and mitochondria dysfunction is considered as one of the causes of diabetes type 2. The weight loss along with insulin sensitivity can help to improve this condition.

Consequences

Type 2 diabetes is not merely a blood glucose level related disease it also severely affects many parts of body and resulting in kidney failure, heart diseases, nervous disorders, arthritis, premature or young age death, cataracts, stroke, hypertension, blood pressure and also physical health illness like obesity, etc. hypertension and diabetes are correlated with each other and may also

result in renal failure and other cardiovascular diseases. Many drugs can reduce hypertension like angiotensin ll type 2 receptor blockers are best working for this function [6].

Treatment of Diabetes

By nutrition: As obesity is one of the important causes of diabetes so the American Diabetes Association or American Heart Association suggested some guidelines regarding the treatment of diabetes in which the first concern is to reduce weight by diet and that should be a 5-10% loss of the body weight. Obesity by affecting insulin sensitivity may result in chronic inflammation [7]. Inflammation caused by obesity may be due to the reason that anti-inflammatory adipocytokines are not normally produced by the body. This link between obesity and inflammation may result in insulin resistance and finally the type 2 diabetes [8].

By exercise: Secondly, exercise is also important in improving insulin sensitization. The IMCL content decreases by diet-reduction, on the other hand, it increases by exercise. The net effect of diet and exercise on IMCL content is zero but it improves the mitochondrial function [9]. When there is no training of exercise but there is only diet-induced weight loss it has no effect on IMCL content or mitochondrial function.

By care and control: The cardiovascular diseases are also the consequence of type 2 diabetes these can be reduced by control of blood pressure and blood glycemic levels. To avoid these complications like hypertension, stroke, renal problems the proper care and management should be provided to the diabetic patient. By the nutrition advisor, a nurse, a physician or a pharmacist [10].

By insulin therapy: The treatment by insulin therapy at the right time is important to control glycemic levels. Not all but 30% of diabetic patients require insulin therapy. Sometimes insulin is given two or three times in a day as multiple daily injections (MDI). The patients with bolus insulin therapy using (MDI) showed the best glycemic control [11]. Before eating this is taken. Neutral protamin gagedron (NPH) is one of that basal insulin. But the hypoglycemic condition comes due to it. Another form is Gagarin that reduces hypoglycemic events. It is given by continuous insulin infusion (CSSI) pumps. Due to hypoglycemic cases in CSSI pumps MDI is preferred and it works slowly all 24 hrs. [12] In this case insulin is given through the abdomen the process is like MDI but not multiple injections. And dose is given according to blood glucose levels. The CSSI pumps were invented in the United Kingdom and the first report about them was published in 1978 by Pickup et al.

Factors Affecting Insulin Sensitivity

Diet is one of the factors involved in insulin sensitivity.
Physical work out (exercise)
Surrounding environment
Drugs also affect insulin sensitivity
And one of the most important factors is genetics [13].

As the relation of type 2 diabetes and genetics is concerned the changes in the DNA methylation may help in the spreading of type 2 diabetes and also the dietary starch has an impact on obesity and diabetes. In the diagnosis of nutritional and environmental stimuli now the DNA methylation is the most common markers.

There are two common types of diabetes one is insulin based diabetes mellitus or called type 1 diabetes the second that is most common and non-insulin based is called type 2 diabetes and its percentage is still increasing [14].

The insulin margarine was better than other types of insulin used in insulin therapy [15]. Many patients with type 2 diabetes require insulin therapy so basal insulin was used for this purpose. The bolus or mealtime insulin is also used for increasing glycemic control levels [16].

Conclusion

Type 2 diabetes can be treated by physical workout, by diet control, and by care but better results can be achieved by insulin therapy. Different types of insulin are available to meet the normal glycemic levels of diabetic patients. And these can be given via (MDI) or CSSI pumps.

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