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TYPES OF DIABETES, CAUSE AND TREATMENT METHODS

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Abstract: This article discusses the types of diabetes, the importance of treatment methods, and their role. This article can be used by healthcare professionals, students and masters studying in this field, as well as independent researchers.

Keywords: diabetes, genetic factor, immune system, viral infections, insulin, metabolism, hormonal background, stress, protein.

INTRODUCTION

Diabetes mellitus (diabetes mellitus) is a chronic endocrine disease common in modern medicine all over the world, characterized by a violation of metabolic processes in the body, especially a decrease in sensitivity to insulin production or its effects. Diabetes mellitus causes an increase in blood sugar (glycosides), which leads to dysfunction of many organs and systems. The mechanism and pathophysiology of the development of this disease are complex, it occurs in the human body as a result of the interaction of metabolic, immunological, and genetic factors.

There are two main types of diabetes: Type 1 diabetes and type 2 diabetes. Both types have their own etiological factors and pathophysiological processes, and also differ in clinical symptoms and treatment methods. In type 1 diabetes, autoimmune damage occurs to the beta cells that produce insulin, which leads to the body's inability to produce insulin. On the other hand, type 2 diabetes is associated with insulin resistance and insufficient insulin production and is mainly associated with social and environmental factors such as obesity and low physical activity. Gestational diabetes also occurs during pregnancy, causing a temporary decrease in insulin sensitivity.

The treatment and management of diabetes, in particular, includes its early diagnosis, constant monitoring of blood sugar levels, proper nutrition and increased physical activity. In addition, the side effects of diabetes can be reduced with the help of pharmacological agents, including various forms of insulin and medications. This article aims to provide evidence-based information about the types of diabetes, its causes, pathophysiology, and treatment methods. The development of effective strategies for the prevention and treatment of diabetes is essential to reduce the negative effects of this disease worldwide.

LITERATURE ANALYSIS

Scientific research on diabetes, its etiology, pathophysiology, and treatment methods has expanded over the years. Numerous epidemiological and clinical studies in Uzbekistan and around the world, as well as research in the field of molecular biology and genetics, have helped to identify a number of factors influencing the development of this disease.

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One of the important studies in studying the specifics of the main types of diabetes — type 1 diabetes and type 2 diabetes - were studies based on understanding the autoimmune mechanisms of type 1 diabetes. These, in turn, allowed for a better understanding of the pathophysiology of this disease (Atkinson et al., 2014; Verge et al., 2018). In type 1 diabetes, it has been found that insulin-producing beta cells undergo specific attacks and that the immune system acts against these cells. However, it has been shown that the role of genetic predisposition is also great in this type of diabetes (pociot et al., 2010).

However, scientific studies have noted that environmental factors such as insulin resistance, decreased physical activity and obesity have a great influence on the development of type 2 diabetes. For example, a study by Kahn (2003) shed light on the neuroendocrine and metabolic mechanisms of this disease by analyzing the processes of insufficient adequate insulin production and decreased cell sensitivity to it in type 2 diabetes. It has been found that obesity, especially its visceral form, can contribute to the development of type 2 diabetes (cusi, 2016).

Also in recent years, extensive research has been conducted on the development of complex methods of treating diabetes mellitus. There are many studies on the effects of nutrition on the development of diabetes. The importance of the glycemic index (gi) and proper nutrition, as well as the role of physical activity in the treatment of diabetes (sigal et al., 2007) is emphasized. The effectiveness of drugs such as metformin, sulfonylureas, GLP-1 receptor agonists, as well as the positive effects of insulin therapy (rosenstock et al., 2012) and a lot of work on new pharmacological approaches (sglt-2 inhibitors).

However, new technologies in the diagnosis and treatment of diabetes, such as continuous blood sugar monitoring (CGM) and innovations such as insulin pumps, are also in the focus of research (bergenstal et al., 2018). These technologies not only make diabetes treatment much more effective, but also improve the quality of life of patients.

THE RESULTS OF THE STUDY

A diabetic patient may have hyperglycemia. The pathology of SD may be unclear because often several factors can cause the disease. Hyperglycemia itself can interfere with the functioning of pancreatic beta cells and cause impaired insulin secretion. Therefore, a vicious circle of hyperglycemia arises, leading to metabolic disorders. Blood glucose levels above 180 mg/dl are often considered hyperglycemic in this context, but due to the variety of mechanisms, there is no clear cut-off point. Patients have osmotic diuresis due to saturation of the glucose transporters of the nephron with high blood glucose levels. Although the effect varies, serum glucose levels above 250 mg/dl can cause symptoms of polyuria and polydipsia.

Insulin resistance is associated with an excess of fatty acids and anti-inflammatory cytokines, which leads to impaired glucose transport and increased fat breakdown. Due to an incorrect reaction or insulin production, the body reacts with an insufficient increase in glucagon levels, which further exacerbates hyperglycemia. Although insulin resistance is a component of DM2, the full extent of the disease occurs when the patient does not produce enough insulin to compensate for insulin resistance.

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Chronic hyperglycemia also causes non-enzymatic glycemia of proteins and lipids. Levels of this can be measured using the hemoglobin glycation test (HbA1c). Glycation causes damage to the small blood vessels of the retina, kidneys and peripheral nerves. High glucose levels speed up the process. This damage leads to the classic diabetic complications of diabetic retinopathy, nephropathy and neuropathy and the preventable consequences of blindness, dialysis and amputation, respectively.

The patient's medical history and physical history questions about family history, autoimmune diseases and insulin resistance are crucial for the diagnosis of diabetes. The disease is often asymptomatic, but when symptoms appear, patients usually experience polyuria, polydipsia and weight loss. During physical examination, a person with hyperglycemia may have poor skin turgor (due to dehydration) and a characteristic fruity smell (in patients with ketosis). In diabetic ketoacidosis (DKA), doctors may note Kussmaul's shortness of breath, fatigue, nausea and vomiting. An examination of the fundus may reveal bleeding or macular exudate in a patient with DM. In severe diabetic retinopathy, retinal venules may appear dilated or blocked. An increase in the number of new blood vessels is also a concern for ophthalmologists and can accelerate retinal bleeding and macular edema, which will eventually lead to blindness. Although DM1 and DM2 may manifest in the same way, they can be separated based on medical history and examination results. Patients with DM2 are usually overweight/obese and have signs of insulin resistance, including black acanthosis, hyperpigmented velvety spots on the skin of the neck, armpits or inguinal folds. Patients who have hyperglycemia for longer may have blurred vision, frequent yeast infections, numbness, or neuropathic pain. Clinicians should ask the patient about the latest changes in the skin of the foot during each visit. An examination of a diabetic foot, including a monofilament test, should be part of a routine medical examination. this eventually leads to blindness. Although DM1 and DM2 may manifest in the same way, they can be separated based on medical history and examination results. Patients with DM2 are usually overweight/obese and have signs of insulin resistance, including black acanthosis, hyperpigmented velvety spots on the skin of the neck, armpits or inguinal folds. Patients who have hyperglycemia for longer may have blurred vision, frequent yeast infections, numbness, or neuropathic pain. Clinicians should ask the patient about the latest changes in the skin of the foot during each visit. An examination of a diabetic foot, including a monofilament test, should be part of a routine medical examination. this eventually leads to blindness. Although DM1 and DM2 may manifest in the same way, they can be separated based on medical history and examination results. Patients with DM2 are usually overweight/obese and have signs of insulin resistance, including black acanthosis, hyperpigmented velvety spots on the skin of the neck, armpits or inguinal folds. Patients who have hyperglycemia for longer may have blurred vision, frequent yeast infections, numbness, or neuropathic pain. Clinicians should ask the patient about the latest changes in the skin of the foot during each visit. An examination of a diabetic foot, including a monofilament test, should be part of a routine medical examination. Patients with DM2 are usually overweight/obese and have signs of insulin resistance, including black acanthosis, hyperpigmented velvety spots on the skin of the neck, armpits or inguinal folds. Patients who have hyperglycemia for longer may have blurred vision, frequent yeast infections, numbness, or neuropathic pain. Clinicians should ask the patient about the latest changes in the skin of the foot during each visit. An examination of a diabetic foot, including a monofilament test, should be part of a routine medical examination. Patients with DM2 are

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For diabetes, it is important to make a nutrition plan. The following is a list of foods recommended for diabetes:

1. Complex carbohydrates: whole grains: black bread, brown rice, oats, loam.

Vegetables: broccoli, carrots, tomatoes, cucumbers, zucchini.

2. Protein sources: chicken and turkey meat: made from the lean part.

Fish: Fish rich in omega-3 fatty acids (salmon, mackerel). Dairy products: skimmed or low-fat milk, yogurt, cheese.

3. Fats: Healthy fats: olive oil, avocado, nuts (it is important to stay away from other sweets).

4. Fruits: Fruits with a low glycemic index: green apples, pears, berries (Moru, strawberries), grapefruit. 5. Unprocessed or insufficiently processed foods: fresh vegetables and fruits: consume them directly. Nuts and seeds: regular consumption, but quantity control is necessary.

6. Drinks: Water: the best drink. Tea and coffee: without added sugar.

Recommendations: Portion control: Controlling the amount of food helps to control blood sugar levels. Meal Planning: Make a meal plan and stick to it every day. Avoid sweets: Limit sweets and stay away from foods with added sugar. Each person's body is different, so when making a nutrition plan, it is important to consult with a doctor or nutritionist.

Diabetics are mainly concerned about symptoms such as thirst, frequent profuse urination, weight loss, loss of appetite, malaise. Patients who have complaints similar to those mentioned above should immediately be examined by an endocrinologist. In modern medicine, when choosing treatments, the severe or mild course of the disease and the presence of complications are taken into account. Because the patient is injected with insulin to make up for the lack of insulin in his youth due to heredity. With a relative deficiency of insulin in the elderly and overweight people, it is necessary to follow a diet in accordance with the doctor's recommendations. Drugs that reduce blood sugar levels are used. A diet is

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often prescribed when the disease is mild. Carbohydrates are low, they can be replaced with meat, black bread and other products. The amount of fatty foods is limited. When the disease worsens, the patient is not given oil and other fatty foods. Almost 20 percent of the calories in food should come from proteins. The food that the patient eats should be rich in vitamins, especially vitamins C and group B. The patient should eat in portions. Patients who follow strict doctor's supervision must strictly follow the daily routine and dietary recommendations, and come to a laboratory examination in a timely manner. Today, diabetes is perceived as a natural disease. Diabetes-according to experts of the World Health Organization, it is a metabolic disorder. This is caused by the observation of an irreversible condition in a certain part of the pancreas. The pancreas is located behind the stomach and is located opposite the 1st, 2nd lumbar vertebrae. Length 10-15 cm, thickness 2-3 cm, weight 70-100 grams. The pancreas consists of 3 parts: the head, trunk, and tail. The main part of the pancreas consists of an external secretory apparatus, which produces mainly the main parts of pancreatic juice. 1-3% of the gland is the endocrine part, that is, the islets of Langerhans (up to 1 - 1.5 million). The diameter of each is 150 microns. There are from 80 to 200 cells in one island. The islets of Langerhans contain several types of cells: A - glucagon is 25%; B - insulin, located in the center, is 60-70%; D - somatostatin, which makes up 10%, the rest - 5%, producing VIP (Visoactive interstitial polypeptide, gastrointerceral polypeptide). Insulin is a highly active chemical (hormone) that accumulates and groups into islets. A person spends energy to live, move and work. He gets his energy from food. Energy is produced as a result of metabolism. On the other hand, carbohydrates and fats are the main sources of energy. Bread, cereals, dairy products, fruits and vegetables, as a rule, contain a lot of carbohydrates. Part of the glucose received from food is absorbed by cells with the help of insulin.Insulin can be compared to a key that unlocks cells. Some of the glucose used for energy production is converted to glycogen in the presence of insulin and accumulates in the liver and muscles as an energy reserve.When glucose is not supplied from the outside between meals, glucose is formed from glycogen and used for energy production. If a certain amount of glucose increases after accumulation in the liver and muscles, insulin promotes its conversion into fat. When blood sugar levels rise, in a healthy person, beta cells increase insulin production and reduce it, returning sugar back to the liver. Blood sugar levels rise when insulin is not produced in sufficient quantities or does not have sufficient effect. On the other hand, insulin is not produced sufficiently when beta cells are damaged. Because beta cells are cells that don't regenerate.

These cells can slow down and become irreversible due to severe stress, severe tension, and severe fear. As a result, the release of insulin decreases. This leads to an increase in blood sugar levels. The normal blood sugar level of a healthy person is 80-120 mg%. However, in diabetics, its amount can increase to 150-250 mg% or even more. When the blood sugar level is normal, it is not excreted through the kidneys in the urine, which means that a healthy person has absolutely no sugar in the urine.

CONCLUSION

Thanks to effective diabetes treatment, people are given the opportunity to lead a healthy and active lifestyle for many years. Detection and early treatment of diabetes allows you to control it without complicating the task.

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This article provides an overview of the causes, symptoms, and various treatments for diabetes. Timely detection and proper treatment of diabetes are crucial for maintaining health.

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