AJPMHS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Pediatric Medicine and Health Sciences
Volume 3, Issue 4, 2025 ISSN (E): 2993-2149

Pancreas Disease - Modern Diabetes Treatment Methods and Anatomy

Tolmasov Ruzibek Tolmasovich, Ergashev Sukhrob Toxir o‘g‘li
Tashkent Medical Academy, Department of Human Anatomy and OSTA
ruzibektolmasov@gmail.com, esuhrob26@gmail.com

Nuraliyeva Umida Nuralievna
Tashkent Medical Academy, Student of the Faculty of Medicine No. 2

Abstract: Diabetes mellitus is an endocrine disease. If a person has a predisposition to diabetes or is in a risk group (for example, overweight, poor diet, sedentary lifestyle), then such conditions are observed and measures should be taken to treat it. For treatment, proper nutrition and physical exercise are mainly necessary. This article describes the causes, symptoms, diagnosis and progress in the treatment of diabetes mellitus.

Keywords: Diabetes mellitus, insulin resistance, type 1 diabetes, type 2 diabetes, treatment, lifestyle, genetics, insulin therapy, insulin pumps.

Introduction: Diabetes mellitus, sugar disease is a disease caused by insulin deficiency and metabolic disorders in the body. In diabetes mellitus, sugar in the blood increases sharply and is excreted in the urine (contains sugar), thirst, dry mouth, weight loss, weakness, itching of the body and other symptoms are observed.

Purpose: to understand diabetes mellitus and its effective treatment methods, although modern endocrinology calls the classification of the disease conditional, it is important to determine the treatment strategy for each type of the disease. This requires a separate discussion of each of them.

Materials and methods: The article used scientific research tools such as the analysis of a number of textbooks, scientific literature, and modern information technologies.

Diabetes mellitus (also known as "sugar disease" among the people) is a disease that occurs as a result of impaired carbohydrate and water metabolism in the body. It is a consequence of impaired pancreatic function. The pancreas produces the hormone insulin. Insulin is involved in the processing of sugar. Without this hormone, the body cannot maintain the level of glucose in the blood at normal levels, and its amount increases. As a result, the body excretes excess glucose through the urine. It is important to classify the disease, since the types of this disease are fundamentally different from each other in the initial period, and treatment is determined accordingly. The longer the disease lasts, the more similar the treatment methods become.

Description: The first sign of diabetes mellitus is an increase in the level of glucose in the blood. The cells of the pancreas (beta cells) are responsible for the production of insulin in the human body. This hormone helps the cells absorb glucose. In diabetes mellitus, insulin is produced in

small quantities, and the level of glucose in the blood increases. However, since glucose cannot be transported without insulin, glucose deficiency is observed in the cells.

This metabolic disease can be hereditary or acquired. In insulin deficiency, secondary pathologies such as purulent and other diseases of the skin, damage to the teeth, kidneys, nervous system, atherosclerosis, angina, hypertension, and vision impairment are observed.

Causes of diabetes mellitus:

➢ Mental stress.

➢ Junk food.

➢ Excessive consumption of sugar and sweets.

➢ Hereditary factors.

➢ Obesity.

➢ Pancreatic diseases

Endocrine disorders and diseases

➢ Excessive alcohol consumption

The most important basis of the problem is the violation of the interaction of insulin with tissues. Glucose is needed by the body as the main energy substrate to continue vital processes. The inability of glucose to enter the tissues and the inability of glucose to be stored in the liver as glycogen causes its level in the blood to increase. These changes are called diabetes mellitus.

There are 2 types of diabetes. Type I and Type II. In Type I diabetes, insulin is not produced by the pancreas. In the treatment of this type, patients are given insulin. Type II diabetes mainly affects middle-aged and elderly people. Patients with this type are prescribed drugs and a diet that lower blood sugar levels.

Type 1 Diabetes: - Autoimmune reaction: the body's immune system mistakenly attacks and destroys the insulin-producing beta cells in the pancreas. This leads to little or no insulin production, which leads to high blood sugar levels. In this case, glucose, which is the body's source of energy, is not absorbed by the tissues. Therefore, this type of disease is called insulin-dependent.

In the treatment of Type 1 Diabetes, treatments such as insulin therapy, blood sugar monitoring, healthy eating, and physical activity provide effective results for the patient.

Type 2 Diabetes: In this type of disease, the islet cells of the pancreas retain the ability to produce insulin, due to which the amount of insulin in the blood may be normal. However, the sensitivity of tissues to insulin decreases sharply, and the absorption and use of glucose by the tissues decreases. As a result, blood sugar levels increase. This type of disease is also called non-insulin-dependent.

In the treatment of Type 2 Diabetes, lifestyle changes, diet, exercise, oral medications, insulin therapy, weight management, and constant monitoring of blood sugar can improve the patient's health.

Disease stages: It is very important to classify the disease according to its severity. It mainly differs depending on the level of glycemia. The stage helps in diagnosis and plays an important role in preventing complications. It is possible to differentiate by knowing how the disease progresses and whether the complications are severe or mild based on medical records.

Stage 1. It is considered the best indicator among the diseases, and any treatment process is aimed at reducing the disease to this stage. The sugar level is completely covered by insulin, the glucose level is around 6-7 mmol / l, glucosuria (excretion of glucose in the urine) does not occur, and other indicators are also normal.

There are no pathologies that have developed against the background of the disease, no complications are observed. This result is achieved by fully adhering to the course of treatment and dieting.

Level 2. This level indicates that insulin is not able to cover the sugar level to some extent. There are damage to the eyes, kidneys, heart, blood vessels, legs, and nerve fibers.

The blood glucose level is slightly increased and is around 7-10 mmol / l, glucosuria does not occur. Other indicators are also slightly above normal.

Level 3. At this level, the disease is actively developing and cannot be controlled with medication. Glucose levels are around 13-14 mmol/l, glucosuria is constant, high proteinuria is observed, damaged organs gradually begin to show signs.

Visual acuity is rapidly decreasing, hypertension is observed, sensitivity in the legs and fingertips is reduced.

Level 4. At this level, absolute decompensation is observed and it is evidence that the treatments (if any) are completely ineffective. Glucose levels rise to serious numbers (15-25 mmol/l and more), attempts to lower blood sugar levels do not give a good result.

Protein excretion through the urine becomes more active. Kidney failure occurs, skin ulcers and gangrene may occur. The risk of coma is extremely high.

Determination of blood glucose levels: Required tools: glucometer, lancing device, glucometer pen, sterile cotton wool, disposable rubber gloves, ethyl alcohol, scaler.

Procedure:

1. Prepare the glucometer
2. Attach the scale to the glucometer pen
3. Attach the lancet to the glucometer
4. Take blood from the arm of a patient with diabetes
5. Place the blood on the lancet of the glucometer
6. Determine the amount of glucose in the glucometer

Figure 1. Using a glucometer

Result: The normal blood glucose level is 3.3-6.1 mmol/l. If the glucose level on the glucometer exceeds the norm, diabetes mellitus occurs.

Insulin therapy. In our country, a free service for the provision of insulin and blood sugar-lowering drugs has been established for patients with diabetes. This, of course, indicates that patients have the opportunity to meet their lifelong need for medical care. All insulin preparations are divided into two main groups: short-acting and long-acting, depending on the onset and duration of their action. Short-acting insulin preparations have a rapid hypoglycemic effect due to their rapid absorption at the injection site. Depending on the situation, insulin therapy can be administered subcutaneously, intramuscularly or intravenously. Long-acting insulin preparations have a much longer duration of action due to their slow absorption at the

injection site. When distributing the daily dose of insulin preparations in this group, 2/3 should fall on the daytime, and 1/3 on the nighttime.

According to the duration of action of insulin preparations registered by the Ministry of Health of the Republic of Uzbekistan Short-acting insulin preparations: Actrapid, Humulin R, Vosulin R. Medium-acting insulin preparations: Insultard, Humulin NPX, Vosulin N. Long-acting insulin preparations: Ultratard NM, Ultralenta, Humulin U, Lantus

What are insulin pumps? Insulin pumps are small computerized devices that inject insulin under the skin. An insulin pump is attached to the human body. Through it, you can enter the required doses of insulin into the body at any time of the day by pressing or programming several buttons. Insulin is injected subcutaneously using an insulin syringe, pen, or special dosing pump. The syringe pen allows you to quickly and almost painlessly enter the required dose of insulin.

Figure 2. Insulin pump

The advantages of this method are: a more accurate effect on physiological insulin secretion (insulin preparations enter the bloodstream throughout the day), the possibility of more accurate glycemic control, the absence of the need for self-injection of insulin, and the risk of acute and long-term complications is also significantly reduced.

The disadvantages include the complexity of the device, problems with fixing it to the body, complications arising from the constant presence of a needle delivering the mixture in the body. Also, a certain difficulty is the selection of an individual operating mode of the device. This method of insulin administration is considered the most promising.

Conclusion: This article concludes that diabetes is caused by a complex interaction of genetic, environmental, and lifestyle factors. Early detection of blood glucose levels and diabetes is now essential. The earlier the disease is detected, the easier it is to treat. Public awareness programs: Governments and health professionals should implement programs that increase awareness of diabetes risk factors and prevention. Further research: More research is needed on environmental factors that contribute to diabetes, including pollutants and the gut microbiota.

References:

1. Аметов А.С. Сахарный диабет 2 типа. Проблемы и решения Москва : ГЭОТАРМедиа, 2015. – 278 с.
2. Калинкин, Л. В. Шпак, Ю. А. Волкова, и другие . Актуальные вопросы эндокринологии в терапевтической практике -Тверь : Фактор и К, 2014 . – 698с.
3. Usmanov R.Dj. , Mirsharapov U.M ., Tolmasov R.T. "Anatomical structure of internal organs and their blood vessels anatomy" // 2024. C-70.
4. Толмасов Р. Т. и др. ЯЗВНАЯ БОЛЕЗНЬ ЖЕЛУДКА И СОВРЕМЕННЫЕ МЕТОДЫ ЕГО ЛЕЧЕНИЯ //THE THEORY OF RECENT SCIENTIFIC RESEARCH IN THE FIELD OF PEDAGOGY. – 2024. – Т. 2. – №. 22. – С. 342-349.
5. Худойназарова С. Ш., Толмасов Р. Т. ЛЕЧЕНИЕ АРИТМИИ СЕРДЦА В СОВРЕМЕННОЙ МЕДИЦИНЕ И АНАТОМИИ СЕРДЦА //THE THEORY OF

RECENT SCIENTIFIC RESEARCH IN THE FIELD OF PEDAGOGY. – 2024. – Т. 2. – №. 22. – С. 336-341.

6. Толмасов Р. Т. и др. АНАТОМИЯ ПОЧЕК И СОВРЕМЕННЫЕ МЕТОДЫ РАННЕГО ВЫЯВЛЕНИЯ ПОЧЕЧНО-КАМЕННОЙ БОЛЕЗНИ //THE THEORY OF RECENT SCIENTIFIC RESEARCH IN THE FIELD OF PEDAGOGY. – 2024. – Т. 2. – №. 22. – С. 329-335.
7. Tolmasovich T. R. et al. ANATOMY AND METHODS OF TREATMENT OF ULCERATIVE COLITIS IN MODERN MEDICINE //JOURNAL OF APPLIED MEDICAL SCIENCES. – 2024. – Т. 7. – №. 6. – С. 62-70.
8. Tolmasovich T. R. et al. TREATMENT OF MYOCARDIAL INFARCTION IN MODERN MEDICINE //JOURNAL OF MEDICINE AND PHARMACY. – 2024. – Т. 7. – №. 6. – С. 132-138.
9. Tolmasovich T. R. et al. MODERN METHODS AND ANATOMY OF DETERMINING LUNG DISEASES //International journal of medical sciences. – 2024. – Т. 4. – №. 08. – С. 45-50.
10. Толмасов Р. Т., Худойназарова С. Ш. ЛЕЧЕНИЕ АРИТМИИ СЕРДЦА В СОВРЕМЕННОЙ МЕДИЦИНЕ И АНАТОМИИ СЕРДЦА //THE THEORY OF RECENT SCIENTIFIC RESEARCH IN THE FIELD OF PEDAGOGY. – 2024. – Т. 2. – №. 22. – С. 354-359.
11. Tolmasov R. T., Jamilova S. K. Causes of Rheumatism and Methods of Treatment in Modern Medicine //American Journal of Pediatric Medicine and Health Sciences. – 2024. – Т. 2. – №. 8. – С. 102-107.
12. Tolmasovich T. R. et al. ANATOMY AND METHODS OF TREATMENT OF ULCERATIVE COLITIS IN MODERN MEDICINE //JOURNAL OF APPLIED MEDICAL SCIENCES. – 2024. – Т. 7. – №. 6. – С. 62-70.
13. Tolmasovich T. R., Narimon o‘g‘li T. L. METHODS OF TREATMENT OF CONGENITAL HEART DEFECTS IN MODERN MEDICINE //Western European Journal of Medicine and Medical Science. – 2024. – Т. 2. – №. 8. – С. 20-26.
14. Tolmasovich T. R. et al. MODERN MEDICAL METHODS OF EARLY DETECTION AND TREATMENT OF KIDNEY STONE DISEASE //JOURNAL OF APPLIED MEDICAL SCIENCES. – 2024. – Т. 7. – №. 6. – С. 55-61.
15. Tolmasovich T. R., Shavkatovna K. S. HEART ARRHYTHMIA DISEASE AND ITS TREATMENT METHODS IN MODERN MEDICINE //JOURNAL OF MEDICINE AND PHARMACY. – 2024. – Т. 7. – №. 6. – С. 139-145.
16. Tolmasovich T. R., Rasulxon o‘g‘li R. R. STOMACH STRUCTURE AND ITS CHANGES DEPENDING ON AGE //JOURNAL OF MEDICINE AND PHARMACY. – 2024. – Т. 7. – №. 6. – С. 107-112.
17. Tolmasovich T. R., Toxir o‘g‘li E. S., Maratovich M. O. TREATMENT METHODS AND ANATOMY OF UMBILICAL HERNIA IN MODERN MEDICINE //AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE. – 2025. – Т. 3. – №. 1. – С. 198-205.
18. Tolmasov R. T. et al. Treatment of Glaucoma in Modern Medicine //American Journal of Pediatric Medicine and Health Sciences. – 2025. – Т. 3. – №. 1. – С. 58-64.
19. Tolmasovich T. R. et al. MODERN METHODS AND ANATOMY OF DETERMINING LUNG DISEASES //Ethiopian International Journal of Multidisciplinary Research. – 2025. – Т. 12. – №. 01. – С. 277-282.

20. Yuldasheva Z. et al. NORMAL YURAK TUZILISHINI YOSHGA OID MOSLASHUV O'ZGARISHLARI //Журнал академических исследований нового Узбекистана. – 2024. – Т. 1. – №. 4. – С. 34-37.
21. Tolmasovich T. R., Faliddinovich F. S., Jasurbekovich E. P. TREATMENT METHODS AND ANATOMY OF ISCHEMIC HEART DISEASE IN MODERN MEDICINE //AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE. – 2025. – Т. 3. – №. 1. – С. 324-331.
22. Tolmasov R. LABORATORY METHODS FOR THE DIAGNOSIS OF UPPER AND LOWER RESPIRATORY TRACT INFECTIONS IN CHILDREN //International journal of medical sciences. – 2025. – Т. 1. – №. 2. – С. 89-93.
23. Tolmasov R. T., Khudoynazarova S. S. OSTEOCHONDROSIS AND ITS TREATMENT METHODS IN MODERN MEDICINE //European Journal of Modern Medicine and Practice. – 2025. – Т. 5. – №. 3. – С. 225-231.
24. Tolmasovich T. R., Toxir o'g'li E. S., Maratovich M. O. TREATMENT METHODS AND ANATOMY OF UMBILICAL HERNIA IN MODERN MEDICINE //AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE. – 2025. – Т. 3. – №. 1. – С. 198-205.