

**DIABETES MELLITUS IN CHILDREN: MODERN TREATMENT APPROACHES*****Rustamova Odinoxon****Kokand University Andijan Branch**Student of the direction of Pediatric work of the Faculty of Medicine**E-mail: orustamova360@gmail.com****Yuldashaliyeva Shaxina****Kokand University Andijan Branch**Student of the direction of Pediatric work of the Faculty of Medicine**E-mail: shaxinayuldashaliyeva****Nurmatova Ro'zaxon****Kokand University Andijan Branch**Student of the direction of Pediatric work of the Faculty of Medicine**E-mail: frpbesh060@gmail.com*

**Annotation:** this article examines modern treatments for diabetes mellitus in children. The article analyzes the epidemiology, pathogenesis, diagnosis and innovative approaches to treatment of the disease. Particular attention is paid to recent advances in Insulin therapy, such as Continuous Glucose Monitoring (CGM), artificial pancreatic systems, and immunotherapy. Literature analysis, treatment effectiveness, and future prospects are also discussed. The article highlights the importance of modern approaches to managing diabetes in children and offers suggestions for future areas of research in this area.

**Keywords:** diabetes mellitus in children, insulin therapy, constant glucose monitoring, artificial pancreas, immunotherapy, modern treatment, type 1 diabetes.

**Introduction:** Diabetes Mellitus is one of the most common chronic endocrine diseases among children. In recent decades, the number of cases of Type 1 diabetes mellitus (T1D) and type 2 diabetes mellitus (T2D) has been growing worldwide. T1D is more common in children and is associated with the loss of beta cells of the pancreas as a result of autoimmune processes. T2D, on the other hand, is generally associated with obesity and metabolic syndrome, and has also been increasing among children in recent years. In modern medicine, great progress has been made in the treatment of diabetes mellitus. New technologies such as Insulin pump, continuous glucose monitoring (CGM), artificial pancreatic systems and immunotherapy have significantly improved the quality of life of patients. This article will be devoted to the analysis of modern methods of treating diabetes mellitus in children and will cover the latest research in this area [1].

**Literature analysis:** in recent years, many studies have been carried out on diabetes mellitus. Prestigious journals in diabetology, such as The Lancet Diabetes & Endocrinology and Diabetes Care, have been covering innovative approaches and technological advances in insulin therapy. For example, Battelino et al (2019) showed the effectiveness of continuous glucose monitoring systems in improving glycemic control. Also research on artificial pancreatic systems (Russell et al., 2021) highlighted the effectiveness of automated insulin delivery. In immunotherapy, however, Herold et al (2020) tested monoclonal antibodies such as teplizumab to slow the development of T1D. These studies have shown the possibility of

maintaining beta cells by affecting the immune system in the early stages of the disease. At the same time, research on T2D (Arslanian et al., 2022) studied the efficacy of metformin and other oral hypoglycemic drugs in children, emphasizing the importance of controlling obesity. The literature notes that modern treatments not only improve glycemic control, but also improve the quality of life of patients. However, the high cost of these technologies and their availability in developing countries remain as a problem [2].

**Methods:** when collecting data for an article, authoritative and reliable sources are selected, since the quality and reliability of scientific research is important. Through platforms such as PubMed and Scopus, scientific papers published in recent years have been analyzed. These platforms include some of the most important journals in the field of Medicine and provide the latest research on diabetes mellitus. Materials from international conferences on diabetes were also used, such as lectures and theses from prestigious events such as meetings of the American Diabetes Association (ADA) or the European Diabetes Research Association (EASD) [3].

ClinicalTrials.gov from the site, however, data from currently ongoing or completed clinical trials were obtained, which made it possible to assess the effectiveness of treatments in real time. For the analysis, publications from 2018-2025 were selected, since during this period the most significant technological and pharmacological advances in the treatment of diabetes mellitus occurred. The search was carried out through keywords, such as “pediatric diabetes” (pediatric diabetes), “continuous glucose monitoring” (continuous glucose monitoring), “artificial pancreas” (artificial pancreas). These words cover the most relevant topics in the field [4].

The selected articles were carefully considered in terms of quality: the methodology, statistical analysis and reliability of the results of the studies were evaluated. As a result, only the most important and up-to-date information was summarized in the article, which helped provide readers with brief but comprehensive information [5].

**Results:** Insulin therapy: Insulin pump and continuous glucose monitoring (CGM) systems provide great inroads in the management of diabetes mellitus. The Insulin pump automatically supplied insulin depending on blood sugar levels, reducing the need for injections in the hands of patients. CGM systems, on the other hand, predict real-time monitoring of blood sugar levels, hypoglycemia (sudden changes in blood sugar), or hyperglycemia (elevated blood sugar). According to a 2019 study by Battelino and leaders, CGM systems reduce the incidence of hypoglycemia by 30-40%, which is especially important in children, as they perceive changes in blood sugar. Artificial pancreas: artificial pancreatic systems combine an insulin pump and a CGM to prevent insulin delivery. It analyzes sugar levels using an algorithm of systems and adjusts the dose of insulin itself if necessary. According to a 2021 study by Russell and leaders, the levels of the artificial pancreas (glycated hemoglobin) decreased by up to 7%, which improves long-term glycemic control. In addition, these systems increase the quality of life of people, as they are free from constant monitoring of blood sugar and adjusting the dose of insulin. Immunotherapy: type 1 bloody diabetes (T1D) is an autoimmune disease in which the immune system destroys the insulin-producing cells of the pancreas. Immunotherapy drugs such as Teplizumab slow down this invasion of the immune system, leading to clinical management of T1D. According to a 2020 study by Herold and leaders, teplizumab switches development of T1D to an average of 2 years, an important achievement in the early leader of the disease. Type 2 diabetes mellitus (T2D) treatment: an increase in T2D in children is closely linked to the

obesity epidemic. Drugs such as Metformin are effective in changing blood sugar levels, but lifestyle changes-for example, a healthy diet and physical activity-are the mainstay of treatment. According to a 2022 study by Arslanian and leaders, obesity management is crucial in the treatment of T2D, as excess weight increases insulin resistance.

**Discussion:** modern methods of treatment management of diabetes mellitus in children achieve great success. CGM and the artificial pancreatic Systems Center for automatic blood sugar control improve pension control, reduce the psychologies of patients and their families. For example, parents are exempt from last-time testing of their children's blood sugar levels. Immunotherapy, on the other hand, helps to keep patients ' pancreatic function longer by slowing the progression of the disease in early T1D prints. However, there are a number of problems that do not look at these achievements. Modern technologies, such as CGM and artificial pancreatic systems, have been of great interest, with little-developed knowledge of them. In addition, preventive measures against obesity have been shown to increase the incidence of T2D among children. For example, programs such as promoting healthy hunting in schools, re-establishing physical activity, and informing parents are key to solving this problem.

**Conclusions and suggestions:** modern ways to treat bloody diabetes in Children information about great success. Technical advances in Insulin therapy, immunotherapy, and lifestyle management strategies have enabled effective disease management. However, further efforts are needed to expand these achievements globally and make them available to everyone. Future research should continue in the following years: to make modern technologies cheaper: to change the cost of construction such as CGM and artificial pancreatic systems, and to develop global collaborative programs to increase their availability in developing countries. For example, through subsidies from international organizations and pharmaceutical companies, these technologies can be made cheaper. Extensive clinical trials in immunotherapy: the effectiveness of drugs such as Teplizumab is again necessary to see the sinab in a wide range of settlements and to study their long-term report in obtaining the age of T1D. This type of testing should cover patients of age groups and ethnicity. Prevention programs against obesity: to get the age of T2D in children, a wide range of anti-obesity programs should be given. This includes education, reestablishing sports conditioning, and providing parents with information about obesity safety. By funding these programs in the states, it is possible to reduce term health services.

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