

# Studying the Causes of the Relationship between Type 2 Diabetes and Obesity

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## ABSTRACT

Obesity and type 2 diabetes are global problems of the 21st century, and their prevalence is growing at an alarming rate. According to the WHO, the number of people with obesity in the last 40 years has tripled in 2016 and accounted for about 13% of the elderly population on the planet (11% of men and 15% of women) and 39% of the elderly and adults are overweight (men 39% and women 40%). According to experts, by 2030, 38% of the world's elderly population will be overweight and 20% will be obese. The high prevalence of type 2 diabetes is directly related to obesity, with approximately 90% of patients being overweight or obese.

**KEYWORDS:** Obesity, Type 2 diabetes, glucose, insulin.

Type 2 diabetes mellitus is one of the most common diseases in the world due to its high prevalence, high mortality and disability due to macro and microvascular complications. Currently, the number of patients with type 2 diabetes continues to grow. According to WHO, 415 million people worldwide have diabetes. The high prevalence of type 2 diabetes is directly related to obesity, with approximately 90% of patients being overweight or obese. This is the second global epidemic in which obesity is a major contributor to type 2 diabetes. Due to unhealthy diet, inactivity, unhealthy lifestyle, physical and mental stress, obesity is increasing in the population, and as a result, the incidence of type 2 diabetes is also increasing among middle-aged and over 45-year-olds. Diabetes also increases the risk of cardiovascular disease in patients with type 2 diabetes. Obesity and type 2 diabetes require long-term treatment from the moment of diagnosis. A 5-10% reduction in body weight is associated with improved glycemic control and reduced risk factors for the development of this disease. Patients with type 2 diabetes have cardiovascular disease - insulin resistance, blood pressure, cholesterol and triglycerides, inflammatory markers, and damage to endothelial vessels.

Despite the clear benefits of weight loss for disease risk prevention, long-term clinically significant weight loss in patients with type 2 diabetes is difficult to achieve. People with type 2 diabetes have a harder time losing weight than people without diabetes for a number of reasons. Currently, most of the patients with type 2 diabetes lose sensitivity to insulin, and the liver does not use the required amount of glucose, resulting in hyperinsulinemia. Triglyceride synthesis and storage, while lipolysis is suppressed in adipocytes, resulting in an increase in adipose tissue mass. As a result, the hormonal and metabolic compensatory changes that accompany obesity lead to weight gain. Another reason that weight control is difficult in patients with type 2 diabetes is that it is more difficult to lose weight due to the use of a

number of drugs that lower blood glucose levels. When choosing therapy for the treatment of patients with type 2 diabetes, the hypoglycemic effect should be evaluated equally, that is, with the effect of drugs on body weight. All hypoglycemic drugs can be classified according to their effect on weight as follows: groups of drugs that cause weight gain (insulins, thiazolidinediones), neutrally causing drugs (biguanides, DPP-4 inhibitors,  $\alpha$ -glycosidase inhibitors) and Weight loss-promoting agents (glucagon-like peptide agonists) type 1 (GLP-1), sodium-glucose cotransporter type 2 (NGLT-2) inhibitors, for example, cause obesity and body weight differently. The goal of obesity prevention therapy is to improve patients' health and quality of life. In the treatment of patients with weight gain-obesity and type 2 diabetes mellitus, it is necessary to take into account not only obesity, but also other factors, comorbidities, complications of obesity, and other diseases.

In addition to prescribing drugs to treat excess body weight in patients with type 2 diabetes, patients should be advised to follow a low-calorie diet, change their lifestyle, and do physical exercises. As mentioned above, any dietary restriction should be individual. Today, there are several options for dietary strategies for diabetes in overweight patients.

Guidelines for managing blood sugar and obesity in patients with type 2 diabetes should include the following: Explain the need to initiate treatment for diabetes and obesity with intensive lifestyle modification programs. Complex lifestyle modification programs not only help to change the patient's lifestyle, but also the diet and the level of physical activity should be determined. When choosing hypoglycemic therapy, preference should be given to drugs with a low risk of hypoglycemia and neutral drugs, and drugs that increase body weight should be limited.

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