



## Methods for Assessing the State of Hyperglycemia at Different Body Weight

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**Abstract:** Obesity is currently one of the most serious medical, social and economic problems of modern society. Over the past 40 years, there has been an increase in the number of overweight and obese people [1-3]. Singh G.K. and so on., Analyzing data from 1976-2008, it showed that in the older age of the American population ( $\geq 18$  years old), excess weight increased from 36.9% to 62%, obesity increased from 8.7 to 27.4% [1]. A. Berghöfer and others. In 2008, he published a systematic review of the prevalence of obesity in Europe, summarizing data from the end of 1980 to 2005. In Portugal, Poland, the Czech Republic, Romania and Albania, the obesity of the population of the countries of Eastern Europe and the Mediterranean was higher than in the countries of Western and Northern Europe [4].

According to the World Health Organization, more than 1.9 billion inhabitants suffer from excess body weight. More than 600 million of them suffer from obesity. Over the past ten years, the number of obese patients has increased by 75%. By 2030, 73 percent of men and 63 percent of women in Europe are expected to suffer from obesity. As for the problem of overweight and obesity, in many countries of the world, screening programs between children and adolescents are actively implemented to solve this problem at the population level (O'Connor EA., 2017, The Most Pediatrician (Barc). 2019). [5].

It is known that overweight and obese people are at high risk of developing metabolic syndrome, dyslipidemia, diabetes mellitus (QD), arterial hypertension, coronary heart disease, cerebral stroke, and cancer [6-9]. The results of epidemiological studies have repeatedly confirmed a strong positive link between obesity and the risk of developing Type 2 diabetes (QD2). In the United States, the risk of diabetes in adults increases by 9% for every kilogram of weight [10]. Koh-Banerjee P and others. In the United States, it has been proven that an increase in body weight in men leads to an increase in the risk of diabetes by 7.3% [11].

Currently, there are 3 groups of diagnostic criteria for MS: who criteria, criteria recommended by the Adult Treatment Panel III (Adult Treatment Panel III (ATP III)) and criteria from the American Association of Clinical Endocrinologists. These MS criteria combine arterial hypertension (AG), hypertriglyceridemia, and a decrease in cholesterol levels in high density lipoprotein (HDLP). According to the WHO criteria, laboratory confirmation of insulin resistance is required for the diagnosis of MS, obesity is mandatory according to the recommendations of ATP III (Dedov I.I. 2016).

The main link in Ms pathogenesis is primary insulin resistance and compensatory hyperinsulinemia.

Insulin resistance - a decrease in the biological effect of endogenous or exogenous insulin –occurs in 58% of people with hypertension, 84% with hypertriglyceridemia, 84% in Type 2 diabetes mellitus. When combined with dyslipidemia, hyperuricemia and hypertension, which are the main components of Type 2 diabetes (or impaired glucose tolerance), it is 95%. (Schwartz V.A., 2015)

The purpose of the study. Methods for assessing the state of hyperglycemia at different body weight

### Materials and research methods.

In Bukhara, 703 patients were examined, from which methodical discrepancies were made in 100 patients, they were examined according to the program that provides for the identification of the main components of Ms. At the same time, the work used materials from population studies conducted between 400 Bukhara residents and 700 men aged 20-69 in Tashkent.

During the survey, the following research methods were used: - this was done on the basis of a standard questionnaire developed for the study. Instrumental methods include the following: - ECG at rest in 12 conventional conductors, measurement of blood pressure by the Korotkov method, when assessing blood pressure, the average values of 2 measurements taken with an interval of at least 2 minutes are taken into account.

Excess body weight, according to the recommendations of the International Obesity Group (1997), is determined according to the following formula in the index "Kettle":  $\text{weight (kg) / height (m)}^2 \geq 25$  and KI levels  $\geq 30$  are perceived as obesity. . At the same time, when studying the population according to OTV, it is recommended to take KI values  $> 29$  (Rose G. A., Blackburn H., 1968). The OTV criteria were adopted as  $\text{KI} \geq 30$  because this KI level is not much different from the OTV criteria recommended for Population Studies and at the same time meets the obesity criteria recommended by the international obesity status group.

The state of tolerance to glucose, based on the indicators of the standard glucose tolerance test (GTT), was assessed by the determination of nahorgi glycemia, as well as the assessment of glucose glycemie parameters 1 and 2 hours after taking 75 g was carried out in accordance with the methodological recommendations of the Russian Scientific Center for Endocrinology, taking into account the recommendations of According to these recommendations, the evaluation of the data obtained was carried out according to the following criteria (in mg%): violation of normal glucose tolerance:  $<100$  at the level of nahorgi glycemia,  $<160$  after 1 hour of glucose saturation and  $<100$  after 2 hours; impaired glucose tolerance: nahorgi glycemia  $<100;$   $> 160$  after 1 hour of glucose saturation and / or  $> 100$  after 2 hours; diabetes: 180, and after 2 hours it was manifested by a figure of  $> 130$ .

### Research results

Obesity is a chronic multi-factor heterogenic disease manifested by excessive formation of adipose tissue, usually with a high cardiometabolic risk, with specific complications and concomitant diseases that develop naturally.

Currently, there are different classifications of obesity [20]. The proposed classification makes it possible to stratify patients using simple methods of anthropometric and clinical examination on the risk of complications of obesity, cardiometabolic risk, to assess the metabolic phenotype of obesity and the effectiveness of treatment, as well as to change at different stages of the disease.

Many metabolic and hemodynamic disorders, as well as pathologies of many organs and systems, are often associated with obesity. Currently, these conditions can also be its complications. Complications and diseases associated with the state of obesity include:

- glucose tolerance disorder, nahorgi glycemia disorder, or a combination of both (each of the three positions characterizes prediabetes)
- ✓ Type 2 diabetes
- ✓ arterial hypertension
- ✓ hypertriglyceridemia / dyslipidemia

- obstructive sleep apnea syndrome
- non-alcoholic fatty liver disease
- polycystosis ovarian syndrome
- ✓ osteoarthritis
- ✓ urinary incontinence
- gastroesophageal reflux disease (GERK)
- ✓ restriction of mobility and social adaptation
- ✓ psychoemotional disorders and / or stigmatization

### **Obesity and carbohydrate metabolism disorders**

Carbohydrate metabolism disorders occur in at least half of patients with obesity records. AS and obesity in general is an important XF for the development of not only cardiovascular diseases, but primarily type 2 diabetes. Parameters such as OTV are important components of the scale to predict the risk of developing diabetes. However, the annual glucose tolerance disorder in diabetes mellitus is observed in 5-10% of patients and 20-34% for 5 years, as well as with a combination of glycemia ( $> 5 \text{ mmol/l}$ ) and disorders. Glucose tolerance-at 38-65%. In the case of glucose tolerance disorders, the likelihood of switching to diabetes is much higher in people with excess body weight. The likelihood of the occurrence of Type 2 diabetes mellitus is also determined by the duration of obesity and the deposition properties of adipose tissue in the body. Therefore, in patients with obesity, an examination is necessary to identify disorders of carbohydrate metabolism and type 2 diabetes mellitus (Table 2). Regular screening is carried out at least 1 time in 3 years - with a negative result, or more often-by decision of the doctor (depending on the results of the previous examination and the number of risk factors).

There are types that have additional risk factors for the development of diabetes after the age of 45:

- presence of first-degree relatives with diabetes;
- sedentary lifestyle;
- women who have given birth to children weighing more than 4 kg or who have gestational diabetes;
- presence of arterial hypertension;
- HDLP (high density lipoprotein) level  $<0.9 \text{ mmol/l}$  and / or TG level  $> 2.82 \text{ mmol/L}$ ;
- polycystic ovary syndrome;
- clinical picture associated with insulin resistance.

Analyzes cases of OTV and obesity in people with different categories of hyperglycemia. As it turned out (Table 3), in all categories of hyperglycemia, the rate of OTV and the observed state of obesity increases significantly.

Note: the table shows the reliability of the differences in indicators in relation to the group without hyperglycemia.

It turned out that 1 hour after the glucose-saturated state, patients with hyperglycemia had a higher OTV frequency after 2 hours after the glucose-saturated state and compared to patients with diabetes mellitus. The frequency of OTV in patients with diabetes is slightly lower than in nahorgi hyperglycemia, which can be explained by the fact that patients with diabetes are more likely to develop obesity, and its frequency is 2 times higher than in patients with nahorgi hyperglycemia, and in general, 1 hour after glucose saturation, 1 hour after glucose saturation (57.69% and 57.23%, respectively) with the fold occurs more often. The highest indicator of excess body weight (OTV + obesity) is most common in patients with hyperglycemia and diabetes mellitus (82.09% and 80.49)2 hours after being saturated with glucose. Disorders of the sympathoadrenal phase of the glyemic

curve are also associated with excess body weight (OTV + obesity). In the case of people with hyperglycemia in patients with diabetes mellitus, a slightly lower body weight (OTV + obesity) performance after 2 hours can be explained by the fact that patients with diabetes are registered and take certain measures to control weight.

Currently, when assessing body weight, it is customary to take into account such an indicator as abdominal obesity (AS). According to the data obtained, AS is most rare (32.74%) in patients with normal tolerance to glucose. With hyperglycemia on an empty stomach, the frequency of AS is 1.8 times higher (42.31%), with glycemia impaired 1 hour after glucose loading, 2.2 times higher than with normal glycemic levels (50.94%). The highest rate of occurrence of AS is observed in patients with diabetes mellitus (80.49%) and in a group of people with glycemia disorders 2 hours after glucose loading (74.63%). It should be noted that the differences in all indicators of the frequency of AS in different categories of hyperglycemia groups had statistically significant differences from the indicator of the frequency of AS in a group of people with normal glucose tolerance.

### Conclusion.

1. Different categories of hyperglycemia are common in the studied population. Patients with diabetes mellitus, nahorgi hyperglycemia, occur more often 2 hours after being saturated with glucose and 1 hour after being saturated with glucose in hyperglycemia.
2. It is important to study hyperglycemia 1 hour after being saturated with glucose, since this category of hyperglycemia, on the one hand, is common among the population and, on the other hand, can develop into hyperglycemia and diabetes 2 hours after exercise. .
3. For all categories of hyperglycemia, a high indicator is observed, including OTV, obesity, abdominal obesity. These components are more associated with saturated hyperglycemia, including disorders of the sympathoadrenal phase of the glycemic curve.

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