Overweight and Obesity in Patients with Disordered Glucose Tolerance

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Abstract: Purpose: To study the prevalence of obesity and excess weight in various types of hyperglycemia. Information was collected on the prevalence of disorders of the sympathoadrenal phase of the glycemic line. It was found that all types of hyperglycemia, disorders of the sympathoadrenal phase of the glycemic line are associated with obesity and excess weight.

Key words: hyperglycemia, hyperlipidemia, metabolic syndrome (MS).

Actually

According to the World Health Organization, obesity is currently a non-infectious epidemic due to its prevalence in the population, high risk of developing cardiovascular diseases, early disability and early death of patients. According to WHO, ~30% of the world's population is overweight, of which 16.8% are women and 14.9% are men. Today, this indicator is increasing by 10%.

Today, obesity has become one of the most important medical and social problems in the world, due to the high level of its prevalence and the fact that many efforts are being made to eliminate its consequences. The prevalence of overweight and obesity in the Russian Federation is 59.2% and 24.1% [1]. According to the United Nations, in 2013, the Russian Federation ranked 19th among all countries in the world in terms of the prevalence of obesity, 8% behind Mexico and the United States. According to the multicenter (11 regions of the Russian Federation) observational study ESSE-RF (epidemiology of cardiovascular diseases and their risk factors in the regions of the Russian Federation), when questionnaire surveys were conducted among 25,224 people aged 25-24, the prevalence of obesity among the population was 29, was 7% [2]. Over the last thirty years, the prevalence of overweight and obesity, one of the pressing problems, has increased by almost 30-50% among adults and children.

Today, obesity is not only the most important risk factor for cardiovascular diseases and type 2 diabetes (according to the World Health Organization, overweight and obesity predict the development of type 2 diabetes by 44-57%, and 17 -23% are ischemic heart disease, 17% - arterial hypertension, 30% - cholelithiasis, 14% - arthrosis, 11% - poor quality products [3]), as well as the risk of developing reproductive diseases and cancer is increasing. [4]. In short, according to expert research, obesity causes a 4-fold increase in the risk of death from cardiovascular diseases, and a 2-fold increase in death from cancer [5;6].

The purpose of the study. Study of obesity status and prevalence of overweight in different categories of hyperglycemia.

Research methods: The research was conducted in the city of Bukhara. A total of 1050 patients were examined in Bukhara, who were examined under the program that provides identification of the main components of MS.

The following research methods were used during the examination: - blood glucose, insulin, glycated hemoglobin, overweight, coagulogram, creatinine, clinical examination of blood and urine, abdominal obesity, blood pressure, blood lipids, Kettle's index, waist circumference, correlations of body condition with exercise tolerance was studied. Patients ranged in age from 20 to 80 years, and all patients were matched for age, sex, prior therapy, and comorbidities, and without glucose-lowering therapy.

Abdominal obesity was defined as waist circumference > 94 cm for men and > 80 cm for women. Excess weight was determined by the Kettle index (KI) and calculated according to the following formula: weight (kg) / height (m) ^{2}. KI levels between 25 and 29.9 were scored as TVI, and KI levels ≥30 were considered obesity. The state of glucose tolerance was studied using an oral glucose tolerance test with determination of glucose in capillary blood on the "GlucoDr" automatic glucoanalyzer. The level of glycemia was studied on an empty stomach, as well as 1 and 2 hours after taking 75 g of glucose. Assessment of blood glucose levels was performed according to WHO criteria (WHO, 1999).

To evaluate the ratio of sympathoadrenal and vagoinsular phases, the following glycemic ratios were studied: Boudin's coefficient is the ratio of glycemia after 1 hour of glucose saturation to postglycemic level. This coefficient reflects the activity of the sympathoadrenal phase of the glycemic curve, and in our study it is defined as the hyperglycemic coefficient (Hyper GK); - Rafalsky coefficient is the ratio of fasting blood glucose to glucose level 2 hours after glucose saturation. This coefficient reflects the ability of the body to use glucose, that is, it represents the activity of the vagoinsular phase of the glycemic curve (PostGK). In addition to these coefficients, we included another coefficient in the study - the hypoglycemic coefficient (HypoGK). It is the ratio of the amount of glucose in the body 1 hour after glucose saturation to the level of glucose in the body 2 hours after glucose saturation.

Results and discussion: According to the obtained data (Table 1), TVI and obesity status were higher among individuals with different categories of hyperglycemia.

1 Table Different types of hyperglycemia cases of overweight and obesity in patients with

Expression of frequency in percentaGES				
	Body weight status	TVI	Obesity	TVI + Obesity
Glycemic status _ _ _ _ _	72,23	22.54	5.23	27.77
Hyperglycemia at lunch At dinner	42.31	30.77	26.92	57.69
After 1 hour	42.77	32.70	24.53	57.23
After 2 hours	17.91	26.87	55.22	82.09
Diabetes	19.51	26.83	53.66	80.49

The table shows the reliability of the differences in indicators compared to the non-glycemic group.

The frequency of TVI was higher in hyperglycemic patients 1 hour after glucose loading than in diabetic patients 2 hours after glucose loading. In addition, the frequency of TVI in patients with diabetes mellitus was slightly lower than that of hyperglycemia in the diet. This can be explained by the fact that obesity is more developed in patients with diabetes and its frequency is 2 times higher than in patients with hyperglycemia and 1 hour after saturation with glucose. In general, excess weight

(TVI + obesity status) in patients with hyperglycemia and 1 hour after glucose saturation (57.69% and 57.23% respectively) is faster than normal glycemic level (27.77%). The highest indicator of obesity (TVI + obesity) occurs with hyperglycemia and diabetes (82.09% and 80.49) after 2 hours of glucose repletion. These data show that disruption of the sympathoadrenal phase of the glycemic curve is important from the point of view of disease with overweight (TVI + obesity). A slightly lower post-diabetic weight (BMI + obesity) after 2 hours in pre-diabetic patients than in hyperglycemic patients can be explained by the registration and weight control measures of patients with diabetes.

Currently, it is customary to consider such an indicator as abdominal obesity when assessing body weight. According to the obtained data, abdominal obesity is the least common in patients with normal glucose tolerance (32.74%). The frequency of abdominal obesity with hyperglycemia on an empty stomach is 1.8 times higher (42.31%), and 2.2 times higher (50.94%) with impaired glycemia after 1 hour of glucose saturation than with normal glycemic levels. The highest rates of abdominal obesity are found in patients with diabetes (80.49%) and in the group of people with glycemic disorders after 2 hours of glucose saturation (74.63%). It is worth noting that the differences in all indicators of the frequency of abdominal obesity in the groups of different categories of hyperglycemia had statistically significant differences from the indicator of the frequency of abdominal obesity in the group of people with normal glucose tolerance.

Thus, the obtained results allow us to conclude that abdominal obesity is closely related to all categories of hyperglycemia. At the same time, for the first time, a clear relationship between abdominal obesity and disruption of the sympathoadrenal phase of the glycemic curve was established.

Summary:

1. Different categories of hyperglycemia are common in the studied population. In addition to the commonly recognized categories of hyperglycemia, such as diabetes mellitus, postprandial hyperglycemia, and hyperglycemia, hyperglycemia 2 hours after glucose saturation is also more common 1 hour after glucose loading.

2. It is important to study hyperglycemia 1 hour after glucose saturation, because this category of hyperglycemia, on the one hand, is common among the population (21.8%), and on the other hand, it can turn into hyperglycemia 2 hours after exercise and diabetes.

3. For all categories of hyperglycemia, TVI obesity, including abdominal obesity, is observed. This is mainly due to post-load hyperglycemia, including disruption of the sympathoadrenal phase of the glycemic curve.

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