INDICATORS OF BASAL AND POST-LOADING GLYCEMIA IN PATIENTS WITH VARIOUS MANIFESTATIONS OF CORONARY HEART DISEASE

[1]Ibadova M.U., [1]Tulaboeva G.M., [1]Khatamova D.T., [1]Nuritdinov Sh.F., [1]Nurmuxamedova D.E.

[1]Center for the Development of Professional Qualifications of Medical Workers

✓ **Resume**

The state of glycemia in patients with various clinical forms of CHD was studied. A total of 135 male patients aged 30-69 years suffering from coronary heart disease were examined. For the diagnosis of CHD, a survey and instrumental methods of research were used. The survey was conducted according to the standard WHO questionnaire to identify stable angina and possibly myocardial infarction. The ECG data were analyzed according to the Minnesota code. The following clinical forms of CHD were studied: a previous myocardial infarction, stable angina, pain-free myocardial ischemia, a possible history of myocardial infarction, and possible CHD according to ECG data. The level of glycemia was studied on the standard glucose tolerance test (GTT). Fasting glycemic levels were studied, as well as one and two hours after taking 75 g of glucose.

Established differences in the levels of basal and post-loading glycemia in various clinical forms of CHD. These data, to a certain extent, are associated with the literature data that the typical clinical picture of CHD changes under conditions of hyperglycemia. At the same time, the results of the study indicate that hyperglycemia is associated with a more severe form of CHD (a previous myocardial infarction) and an atypical course of this disease.

Keywords: coronary heart disease, pain-free myocardial ischemia, metabolic syndrome, glycemia, impaired glucose tolerance.

ПОКАЗАТЕЛИ БАЗАЛЬНОЙ И ПОСТНАГРУЗОЧНОЙ ГЛИКЕМИИ У ПАЦИЕНТОВ С РАЗЛИЧНЫМИ ПРОЯВЛЕНИЯМИ ИШЕМИЧЕСКОЙ БОЛЕЗНИ СЕРДЦА

[1]ИбадоваМ.У., [1]Тулабоева Г.М., [1]Хатамова Д.Т., [1]Нуритдинов Ш.Ф., [1]Нурмухамедова Д.Э.

[1]Центр развития профессиональной квалификации медицинских работников

✓ **Резюме**

Изучено состояние гликемии у пациентов с различными клиническими формами ИБС. Обследовано 135 пациента мужского пола в возрасте 30-69 лет, страдающих ИБС. Для диагностики ИБС применялись опросные и инструментальные методы исследования. Опрос проводился по стандартному опроснику ВОЗ для выявления стабильной стенокардии и возможного инфаркта миокарда. Анализ данных ЭКГ проводили по Миннесотскому коду. Анализировали следующие клинические формы ИБС: перенесенный инфаркт миокарда, стабильная стенокардия, безболевая ишемия миокарда, возможный инфаркт миокарда в анамнезе и возможная ИБС по данным ЭКГ. Уровень гликемии изучали на основании показателей стандартного теста толерантности к глюкозе (ТТГ). Анализировали уровни гликемии натощак, а также через один и два часа после приема обследуемым 75 гр. глюкозы.

Установлены неоднозначные уровни базальной и постнагрузочной гликемии при различных клинических формах ИБС. Эти данные, в определённой степени, ассоциируются с литературными данными о том, что в условиях гипергликемии изменяется типичная клиническая картина ИБС. Вместе с тем, результаты исследования указывают на связь гипергликемии с более тяжёлой формой ИБС (перенесенный инфаркт миокарда) и атипичным течением этого заболевания.

Ключевые слова: ишемическая болезнь сердца, безболевая ишемия миокарда, метаболический синдром, гликемия, нарушение толерантности к глюкозе.

KORONER YURAK KASALLIKLARINING TURLI KO'RINISHLARI BO'LGAN BEMORLARDA BAZAL VA POSTNAGRUZOCHNOY GLYSEMIYA KO'RSATKICHLARI

[1]Ibadova M.U., [1]Tulaboeva G.M., [1]Khatamova D.T., [1]Nurmuxamedova D.E.

[1]Tibbiyot xodimlarining kasbiy malakasini rivojlantirish markazi

✓ *Rezyume*

Koronar yurak kasalligining (KYuK) turli klinik shakllari bo'lgan bemorlarda glysemiya holati o'rganildi. KYuK chalingan 30-69 yoshida 135 erkak bemor tekshirildi. KYuK ning tashxisi uchun so'rov va instrumental tadqiqot usullari ishlatilgan. Tadqiqot JSST standart so'rovnomasida barqaror stenokardiya va miokard infarktini aniqlash uchun o'tkazildi. EKG ma'lumotlarini tahlil qilish Minnesota kodiga muvofiq amalga oshirildi. Koronar yurak kasalligining quyidagi klinik shakllari tahlil qilindi: miokard infarkti, barqaror stenokardiya, miokard ishemiyasi, anamnezda miokard infarkti va EKG ma'lumotlariga ko'ra, mumkin bo'lgan KYuK. Glycemia darajasi glyukoza bardoshlik (GB) standart test ko'rsatkichlari asosida o'rganildi. Qorin bo'shlig'ida glysemiya darajasini, shuningdek, 75 gr. glyukozani qabul qilgandan keyin bir va ikki soat o'tgach tahlil qilindi.

Koronar arter kasalligining turli klinik shakllarida bazal va glyukoza yuklamasidan keyin glysemiyasining turli xil darajalari aniqlandi. Ma'lum darajada, ushbu ma'lumotlar, giperglisemiya sharoitida KYuK ning odatdagi klinik ko'rinishi o'zgarganligi haqidagi adabiy ma'lumotlarga mos kelmoqda. Shu bilan birga, tadqiqot natijalari giperglisemiyaning KYuK (miokard infarkti) va bu kasallikning atipik kechishi bilan bog'liqligini ko'rsatadi.

Kalit so'zlar: koronar yurak kasalligi, og'riqsiz miokard ishemiyasi, metabolik sindrom, glisemiya, buzilgan glyukoza bardoshlik.

Relevance

The effectiveness of the control of cardiovascular diseases (CVD) is closely related to the early detection and elimination of risk factors. The fight against risk factors is one of the main areas of modern healthcare. In many countries of the world, including Uzbekistan, preventive medicine is given priority [1]. To effectively prevent CVD, it is necessary to identify risk factors in a timely manner [2]. Predictors of many diseases, including CVD, include a wide range of risk factors that contribute to the development of diseases and mortality from them [3]. The main risk factors for CVD include insulin resistance, arterial hypertension (AH), obesity and overweight (BMI), as well as dyslipidemia [4]. It has been established that the formation, clinical course, and outcomes of coronary heart disease are influenced by both the presence of components of the metabolic syndrome and their various combinations [5,6,7]. At the same time, the dynamics of the prevalence and levels of risk factors are significantly affected by hyperglycemia [8].

Type 2 diabetes significantly increases the risk of coronary heart disease (CHD). At the same time, among the leading causes of death and disability, this disease in its significance rose from 15th place in 2000 to 8th place in 2016 [9].

In 129 studies involving 10,069,955 people, it was shown that prediabetes is closely associated with an increased risk of mortality, both from all causes and CVD [10]. At the same time, it was found that screening and treatment of prediabetes can improve primary and secondary prevention of CVD. CHD can occur in various forms, including in a pain-free or atypical form.

The purpose of the study. To study the state of glycemia in patients with various clinical forms of coronary heart disease.

Material and methods

A total of 135 male patients aged 30-69 years with CHD were examined. Questionnaire and instrumental research methods were used to diagnose CHD. The survey was conducted according to the standard questionnaire WHO for the detection of stable angina pectoris (the presence of pain or other unpleasant sensations localized behind the sternum and /or / in the left half of the chest and left arm, which appears during physical exertion and stop after a decrease in intensity or cessation of physical exertion) and identifying a possible myocardial infarction (the presence in the anamnesis of severe pain penetrating the anterior part of the chest and lasting 30 minutes or more, in the absence of cicatricial changes on the ECG).

The ECG was taken at rest in 12 conventional leads. Data analysis ECG was carried out according to the Minnesota code according to the following criteria: definite myocardial infarction, the presence of ECG scarring (category 1-1,2 MK); angina – the presence of pain that meet the criteria of the questionnaire which, in the absence of category 1-1,2 MK; painless; coronary heart disease in the presence of ischemic ECG changes (category 4-1,2 and 5-1,2 μm) in the absence of left ventricular hypertrophy, angina, and categories of 1-1,2 MK; possible myocardial infarction in anamnesis (according to the questionnaire who) - in the absence of scarring and ischemic ECG changes and angina; possible ischemic heart disease, including possible scarring of the myocardium ECG (category 1-2-8 and 1-3 μm), possible myocardial ischemia (category 4-3, 5-3 MC), arrhythmic form (category 6-1,2; 8-3 7-1 and MK), ischemia of the myocardium in the presence of left ventricular hypertrophy (category 4-1,2 and 5-1,2 in the presence of 3-1,3 MK).

The level of glycemia was studied on the basis of indicators of the standard glucose tolerance test (TSH). Moreover, fasting blood glucose levels were analyzed, as well as one and two hours after taking 75 g of glucose.

Result and discussion

According to the data obtained, the lowest fasting blood glucose values occurred in patients with stable angina, and the highest glucose levels were observed in patients with previous myocardial infarction and possible coronary heart disease (Table 1). In patients with pain-free myocardial ischemia and a possible history of myocardial infarction, glycemic levels were slightly higher than in patients with stable angina. However, these differences were not statistically significant.

It should be noted that with typical angina pectoris of tension, the lowest glycemic indices were observed. At the same time, glycemic levels were higher in all groups with atypical pain. These data may indicate a link between atypical CHD and elevated fasting blood glucose levels. At the same time, the highest levels of fasting glycemia occurred in patients who had suffered a myocardial infarction.

Table 1.

Average fasting blood glucose values in various forms of CHD.

CHD form	PMI	SAP	PFMI	PosHMI	PosCHD
n	27	42	16	13	37
M	5,214	4,505	4,667	4,556	5,009
95% CI	4,40-6,02	4,35-4,65	4,24-5,09	3,90-5,20	4,53-5,48
Median	4,667	4,444	4,528	4,278	4,722
Variance	4.2122	0.2397	0.6346	1.1605	2.0133
SD	2.0524	0.4895	0.7966	1.0773	1.4189
RSD	0.3936	0.1087	0.1707	0.2365	0.2833
SEM	0.3950	0.07554	0.1991	0.2988	0.2333
5-95 P	3,73-9,75	3,76-5,36	3,80-6,60	3,16-7,20	3,87-7,81

Note: PMI - previous myocardial infarction; SAP - stable angina pectoris;
PFMI - pain-free myocardial ischemia; PosHMI - possible history of myocardial infarction; PosCHD - possible coronary heart disease.

A similar pattern was observed for glycemic levels 1 hour after glucose loading (Table 2). The highest values of glycemia 1 hour after glucose loading were observed among patients with previous myocardial infarction and possible coronary heart disease, and the lowest values of glycemia were observed in patients with stable angina pectoris. Glycemic levels 1 hour after glucose loading were higher in all groups with atypical CHD (painless myocardial ischemia, possible history of myocardial infarction, and possible myocardial ischemia).

Table 2.

Average glycemic values 1 hour after glucose loading in various forms of CHD.

CHD form	PMI	SAP	PFMI	PosHMI	PosCHD
n	27	42	16	13	37
M	9,119	7,743	8,549	7,889	9,144
95% CI	7,64-10,59	7,12-8,36	7,49-9,60	6,10-9,67	8,08-10,20
Median	8,500	7,222	8,972	6,444	7,889
Variance	13.9050	3.9836	3.9152	8.6831	10.1316
SD	3.7289	1.9959	1.9787	2.9467	3.1830
RSD	0.4089	0.2578	0.2315	0.3735	0.3481
SEM	0.7176	0.3080	0.4947	0.8173	0.5233
5-95 P	4,68-16,35	5,06-11,86	5,79-1,90	5,08-14,12	5,65-15,96

Note: PMI - previous myocardial infarction; SAP - stable angina pectoris;
PFMI - pain-free myocardial ischemia; PosHMI - possible history of myocardial infarction; PosCHD - possible coronary heart disease.

The general picture of glycemic control in the same age group 2 hours after glucose loading corresponded to those in relation to fasting glycemia and 1 hour after glucose loading (Table 2). Here, too, the lowest glycaemic values occurred in patients with stable angina pectoris. At the same time, the highest glycemic indices were observed, not in the group of patients who had suffered a myocardial infarction, but in the group with possible coronary heart disease.

Table 3.
Mean glycaemic values at 2 hoursa after glucose loading in various forms of CHD.

CHD form	PMI	SAP	PFMI	PosHMI	PosCHD
n	27	42	16	13	37
M	5,815	4,849	5,448	4,979	5,845
95% CI	4,44-7,18	4,27-5,42	4,57-6,32	3,75-6,20	4,93-6,75
Median	4,222	4,361	5,694	4,111	5,111
Variance	12.0093	3.3807	2.7002	4.0960	7.4352
SD	3.4654	1.8387	1.6432	2.0238	2.7268
RSD	0.5960	0.3792	0.3016	0.4065	0.4665
SEM	0.6669	0.2837	0.4108	0.5613	0.4483
5-95 P	2,65-12,96	2,54-8,47	2,87-8,18	2,78-9,90	2,62-12,30

Note: PMI - previous myocardial infarction; SAP - stable angina pectoris;
PFMI - pain-free myocardial ischemia; PosHMI - possible history of myocardial infarction; PosCHD - possible coronary heart disease.

Conclusion

Thus, the study revealed certain associations of glucose levels at various points of the glycemic curve with the clinical form of CHD. These data, to a certain extent, are associated with the literature data that the typical clinical picture of CHD changes under conditions of hyperglycemia. At the same time, the results of the study indicate a link between hyperglycemia and a more severe form of CHD (previous myocardial infarction) and the atypical course of this disease (PFMI, PosHMI, PosCHD).

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