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Glysemia in Admission to Hospital and the Features of Inhospital Period in Patients With Myocardial Infarction With ST –Segment Elevation

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Abstract: The aim was to determine the features of in-hospital period in patients with myocardial infarction with ST- segment elevation depending on the level of glycemia in admission. There have been examined 319 patients with acute myocardial infarction (190 men and 129 women) aged 59-69 years, who were divided by the level of glycemia in admission into 3 groups: group 1: 110 persons with the concentration of glucose ≤ of 7,1 mmol/l, 2-I – 138 patients with glucose 7,1-11,1 mmol/l, 3-I – 71 patient with the concentration of glucose ≥11.1 mmol/l. The level of glucose in the 3rd group was higher than in the 1-st and 2-nd groups (2,7 times and 1,8 times respectively, p1-3=0,0001, p2-3=0,0008). There has been identified the association of glycemia with traditional factors of cardiovascular risk and the level of troponin T. The blood glucose level can be considered as a universal marker, indicating the presence of disorders of carbohydrate metabolism, and reflecting the stress response to ischemic myocardial damage. Hyperglycemia revealed in admission to the hospital in patients with MI is associated with adverse course of in-hospital period, including the development of lethal outcomes.

Key words: hypergycaemif in admission,myocardial infarction, diabetes mellittus type 2

Despite ongoing prevention and improvement of treatment methods for cardiovascular diseases (CVD), in Russia, mortality from myocardial infarction (MI) not only does not decrease, but, on the contrary, tends to increase [6]. One of the important risk factors for the development of MI is type 2 diabetes mellitus (DM), which leads to an increase in the incidence of MI by 5 times in women and 3 times in men [1,3]. It has been shown that the proportion of patients with previously and newly diagnosed diabetes among patients with acute coronary syndrome (ACS) can reach 45-53%, and with impaired glucose tolerance (IGT) – 20-36% [10].

In recent years, the role of high levels of postprandial glycemia as a marker of the development of in-hospital and long-term complications of MI has been actively discussed [5]. It is known that during MI, the level of glycemia increases in proportion to the volume of myocardial damage and correlates with the

activity of cardiac-specific enzymes, such as creatine phosphokinase MB (CPK-MB), regardless of the presence of carbohydrate metabolism disorders [9]. Despite the available data on the significance of hyperglycemia in patients with ACS, the simplicity and accessibility of determining this parameter at the earliest stages of disease development, in the most common risk stratification scales for MI in modern medical practice (TIMI, CADILLAC, FRISK, etc.)) it is not taken into account. In addition, today there is no consensus regarding the role of hyperglycemia in the implementation of adverse outcomes in the hospital period of MI; therefore, its further study is necessary.

Purpose of the study: to determine the characteristics of the hospital period in patients with ST-segment elevation MI depending on the level of glycemia upon admission.

Materials and methods

319 patients with acute MI (190 men and 129 women) aged 59-69 years were examined. The diagnosis is based on clinical, electrocardiographic (ECG), echocardiographic and biochemical characteristics of this disease [7]. The study was carried out on the basis of the Kemerovo Cardiological Dispensary and the Research Institute of Complex Problems of Cardiovascular Diseases of the Siberian Branch of the Russian Academy of Medical Sciences. The study protocol was approved by the Local Ethics Committee. The criteria for inclusion in the study were the presence of pain in the chest of an anginal nature, not relieved by taking nitroglycerin; signs of subepicardial myocardial damage – ST segment elevation on the ECG; increase in the content of cardiac-specific markers: CK-MB, troponin T, voluntary informed consent of the patient to participate in the study. Criteria for excluding patients from the study: age over 75 years; the presence of clinically significant concomitant pathology (autoimmune diseases, diseases of the thyroid gland, adrenal glands); ACS that occurred as a complication of percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG) surgery. General clinical studies included collecting anamnesis and complaints, determining body weight (kg), height (m), calculating body mass index (BMI) (kg/m2), and measuring blood pressure. The initial clinical and anamnestic characteristics of the patients included in the study are presented in Table 1. The average glucose level upon admission to the hospital was 9.56 ± 0.27 mmol/l. A history of diabetes was observed in 77 (24.1%) patients; newly diagnosed diabetes was diagnosed in 9 (2.8%) patients, taking into account data from repeated determination of glycemic levels and the results of an oral glucose tolerance test (OGTT). Treatment of patients at the hospital stage was carried out taking into account the 2013 ESC recommendations for the diagnosis and treatment of patients with acute MI with ST segment elevation on the ECG. In the absence of contraindications, during their hospital stay, all patients received combined coronary-active, antithrombotic therapy, including acetylsalicylic acid, clopidogrel, β-blockers, ACE inhibitors, and antianginal drugs. At the same time, only 26.1% of patients took statins at the hospital stage of treatment. After discharge from the hospital, patients continued treatment using the main classes of anti-ischemic drugs and about 90% took statins. Upon admission, the glucose content in the blood serum was determined using test systems from Thermo Fisher Sientific (Finland) on an automatic biochemical analyzer Konelab 30i (Finland).

Descriptive statistics methods included calculation of means (M) and errors of the mean (m). Statistical processing of the obtained results was carried out using the STATISTICA 6.1 application package. The nonparametric Kruskal-Wallis test was used to compare several independent groups. Analysis of differences in frequencies in two independent groups was carried out using Fisher's exact test with a two-sided confidence level (p – achieved level of significance). The $p < 0.05$ level indicated statistical significance.

Results and discussion: In accordance with the National standards of care for patients with diabetes

mellitus [2], according to the level of glycemia upon admission, patients were divided into 3 groups: the first group consisted of 110 patients with a glucose concentration ≤ 7.1 mmol/l (average level). vein was 5.94±0.08 mmol/l), the second - 138 patients with a glucose level of 7.1-11.1 mmol/l (average level 8.73±0.09 mmol/l), the third - 71 patients with glucose concentration ≥11.1 mmol/l (average level 13.03±0.58 mmol/l). The glucose level in persons of the 3rd group was higher than in persons of the 1st and 2nd groups (2.2 times and 1.8 times, respectively, p1-2=0.0013, p2-3= 0.0008, p1-3=0.0001). When analyzing the initial clinical and anamnestic characteristics of patients taking into account the level of glycemia upon admission, it is noteworthy that hypertension and hypercholesterolemia, which are undeniable risk factors for the development of CVD, were significantly more common in patients of group 3 (90.0% and 70.0%, respectively) , The BMI of people in this group was also higher compared to group 1. In addition, in this group, more than half of the patients had clinical angina before the development of MI (65.0%), 27.5% had suffered MI in the past, and acute cerebrovascular accident (ACVA) – 10.0% of patients. DM was more common in patients of group 3. However, the percentage of patients who smoke and have a family history of coronary artery disease was higher among people in group 1 (with normoglycemia). Analysis of biochemical markers of myocardial necrosis determined upon admission did not reveal differences in the comparison groups in the level of total CPK and CPK-MB. The level of troponin T in patients of group 3 was 3 times higher compared to patients of group 1 and 1.8 times higher– compared to the 2nd.

During the hospital period, Killip class II AHF occurred predominantly in patients of group 3, as did early postinfarction angina (EPIS), but recurrent MI was observed with greater frequency in patients of group 2. Lethal outcomes in group 3 were recorded more often than in groups 1 and 2 (5.7 times and 2.2 times, respectively). During their hospital stay, patients in group 3 took diuretics, nitrates and insulin with a significantly higher frequency, which characterizes them as a more severe group. Patients in group 1 more often took statins. For other classes of drugs, individuals in the analyzed groups were comparable.

Thus, in individuals of group 3, traditional cardiovascular risk factors such as hypertension, hypercholesterolemia, and obesity were observed with a significantly higher frequency. In addition, the hospital period was more difficult, as evidenced by increased troponin T values, more severe AHF (Killip II), use of diuretics, nitrates and insulin, the number of cases of newly diagnosed type 2 diabetes, RPIS and deaths. All these factors lead to metabolic dysregulation and the development of insulin resistance, which causes further impairment of glucose utilization and increased hyperglycemia, and disruption of the functional state of cardiomyocytes. This assumption is supported by the identified association of glycemic levels with elevated troponin T levels in patients of group 3 and the occurrence of hospital complications and deaths. According to the results obtained, patients with a glycemic level on admission of ≥11.1 mmol/l had a more unfavorable course of the hospital period compared to other patients (Killip class II AHF and the development of RPIS were more often recorded). Thus, hyperglycemia on admission can be considered as a marker of myocardial damage, along with such a generally accepted cardiac-specific marker as troponin T, and a predictor of heart failure, in-hospital complications and death. In addition, it was found that an elevated level of blood glucose in a patient at the time of hospitalization is associated with high mortality both in the hospital period and during the first year after MI, regardless of the presence of diabetes in the anamnesis [8]. In our study, in patients with hyperglycemia upon admission, hospital mortality was 6 times higher compared to patients with normoglycemia. This is confirmed by literature data, according to which an increase in glucose level by 1 mmol/l in patients with MI is accompanied by an increase in mortality by 4%; for patients with hyperglycemia upon admission and an increased level of fasting glycemia the next day, a 3-fold increase in mortality is typical [8]. Previous studies demonstrate that with hyperglycemia more than 11 mmol/l in patients with acute MI, there is a higher incidence of recurrent MI, expansion of

the infarct zone and recurrent ischemia [8]. However, according to the results of our study, recurrent MI was more often recorded in patients with glucose levels of 7.1-11.1 mmol/l, which indicates the need for more careful attention to this category of patients and classifying them as a high-risk group, since hyperglycemia in this case, indicates previously undiagnosed (and, accordingly, untreated) diabetes. identified association of glycemic levels with hypertension, hypercholesterolemia and obesity. Thus, despite the existing debate regarding the prognostic value of hyperglycemia determined in various conditions (at admission, fasting, postprandial), hyperglycemia at admission is important, since it is a universal marker reflecting not only a stress reaction, but also the amount of myocardial damage, the presence of diabetes or IGT, is associated with an unfavorable course of the hospital period of MI. That is why the level of glycemia upon admission should be taken into account in risk stratification and determining tactical approaches to the management of patients. Thus, despite the existing debate regarding the prognostic value of hyperglycemia determined in various conditions (at admission, fasting, postprandial), hyperglycemia at admission is important, since it is a universal marker reflecting not only a stress reaction, but also the amount of myocardial damage, the presence of diabetes or IGT, is associated with an unfavorable course of the hospital period of MI. That is why the level of glycemia upon admission should be taken into account in risk stratification and determining tactical approaches to the management of patients.

Literature

1. Dzhuraeva A. S., Badridinova B. K. ASSESSMENT OF THE INFLUENCE OF DYSLIPIDIMIA ON THE QUALITY OF LIFE OF PATIENTS RECEIVING PROGRAM HEMODIALYSIS //Art of Medicine. International Medical Scientific Journal. – 2022. – T. 2. – №. 1.
2. Kamalidinovna, B. B. (2022). Features of Phosphoric-Calcium Exchange in Patients Treated with Program Hemodialysis. Research Journal of Trauma and Disability Studies, 1(2), 39–45. Retrieved from http://journals.academiczone.net/index.php/rjtds/article/view/60
3. Nurilloeva Sh.N., Juraeva Kh.I. Adequacy pharmacotherapy of metabolic syndrome. // World journal of pharmaceutical research. August-Sept. - 2020. Volume 9. Issue 12. – P. 48 - 53.
4. Nurilloeva Sh.N., Juraeva Kh.I. Adequacy pharmacotherapy of metabolic syndrome. // World journal of pharmaceutical research. August-Sept. - 2020. Volume 9. Issue 12. – P. 48 - 53.
5. Orziqulova Sh. A. Thickness of epicardial adipose tissue as a predictor of Cardiovascular risk; Academicia an international multidisciplinary research journal/ ISSN: 2249-7137 Vol. 11, Issue 9, September 2021 Impact Factor: SJIF 2021 = 7.492 ppt 73-78
6. Orziqulova Sh.A. Arterial hypertension and metabolic syndrome: specifics of antihypertensive therapy / Analyticaljournal of education and development Volume: 01 Issue: 06 | 2021 ISSN: XXXX-XXXX // ppt 72-76
7. Sh, Djuraeva A., and B. K. Badridinova. "METHODS FOR PREVENTING THE DEVELOPMENT OF TERMINAL RENAL FAILURE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS." British Medical Journal 2.1 (2022).
8. Sh. M. Axmedova*; D.B. Raxmatova. ANALYSIS OF THE DISTRIBUTION OF PODAGRIC NEPHROPATHY (COMMENT)// ANALYSIS OF THE DISTRIBUTION OF PODAGRIC NEPHROPATHY (COMMENT)// ACADEMICIA An International Multidisciplinary Research Journal// ISSN: 2249-7137 Vol. 11, Issue 1, January 2021 Impact Factor: SJIF 2021 = 7.492 // ppt 1668-1672 1515TRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES
9. Shodieva Nilufar Utkirzhonovna. Basic risk factors for obesity in young adults annotation// ACADEMICIA: An International Multidisciplinary Research Journal / Volume 12 ISSN: 2249-7137// ppt 681-688
10. Shodieva Nilufar Utkirzhonovna. Main risk factors for overweight and obesity in young people// Eurasian medical research Periodical/ Volume 7 ISSN: 2795-7624 ppt 141-144
11. Shodieva Nilufar Utkirzhonovna. Prevalence of the Main Risk Factors for Overweight and Obesity in Young People// Research journal of trauma and disability studies Volume 01 ISSN: 2720-6866

ppt 14-25
12. Tursunova D .E. FEATURES OF THE SORPTION METHOD APPLICATION IN THE CORRECTION OF DYSLIPIDEMIA AND HYPERGLYCEMIA IN DIABETES MELLITUS/ Journal of Innovations in Social Sciences Volume: 01 Issue: 04 | 2021 ISSN: XXXX-XXXX // ppt 66-70
13. Tusunova Dilobar Erkinovna. MODERN UNDERSTANDING OF THE OCCURRENCE OF COGNITIVE IMPAIRMENTS IN ARTERIAL HYPERTENSION AND THEIR CORRECRION. Asian Journal of Pharmaceutical and Biological Research 2231-2218, Volume 10(Issue 3), 3–10.
14. М.Ш. Тоиров, Ш.А. Орзиқулова. Таълим ва ривожланиш таҳлил. Анализ роли артериальной гипертонии и нарушений липидного обмена в развитии и прогрессировании хронической болезни почек у больных гипертонической Болезнью. Volume: 02 Issue: 10 |Oct- 2022 ISSN: 2181-2624 219-224 бетлар.
15. Орзикулова Шахло Акмаловна. Ожирение И Гипертония Среди Мужчин 18-49 Летнего Возраста…..International Conference on Social and Humanitarian Research …2021—P. 160
16. Худоёрова Дилноза Ризоевна //ОЖИРЕНИЕ В КОНТЕКСТЕ ЭВОЛЮЦИОННОГО РАЗВИТИЯ СОВРЕМЕННЫЕ МЕТОДЫ ДИАГНОСТИКИ И ЛЕЧЕНИЯ.// Analytical Journal of Education and Development // Volume: 02 Issue: 10 | Oct-2022 PP 403-407 .sciencebox.uz
17. Ш.М.Ахмедова, Д.Б.Рахматова. ПОДАГРИК НЕФРОПАТИЯГА ЗАМОНАВИЙ ҚАРАШЛАР // Доктор ахборотномаси №3.1 (96)—2020/стр 118-121
18. Sh. A. Orzikulova Obesity and the Cardiovascular System// Research journal of trauma and Disability studies// Volume: 01 Issue: 05 | 2021 ISSN: XXXX-XXXX www.academiczone.net ppt 9-16
19. Хилола Шарифовна Яхъяева. "РАСПРОСТАЕННЫЙ ПРИЗНАК АНЕМИИ ПРИ ДИАБЕТИЧЕСКОЙ НЕФРОПАТИИ" Scientific progress, vol. 2, no. 5, 2021, pp. 183-185.
20. Yakhyoyeva H.Sh*; Rizaeva M.A** Analysis and assessment of anthropometric body mass Index for women of fertilized age in bukhara region / academician A n i n t e r n a t i o n a l M u l t i d i s c i p l i n a r y R e s e a r c h j o u r n a l// ISSN: 2249-7137 Vol. 11, Issue 9, September 2021 Impact Factor: SJIF 2021 = 7.492// ppt 44-46