FORMATION OF "HARD ENDPOINTS" IN PATIENTS WITH CORONARY HEART DISEASE IN THE PRESENCE OF PAIN SYNDROME AND ISCHEMIC CHANGES ON ECG

Kayumov U.K.[1], Kalandarova U.A.[2], Ibragimov A.Yu.[1], Nuritdinov Sh.F.[1],
Ariphodjayeva F.Z.[3], Ismailov K.Ya.[1]

[1]Tashkent Institute of postgraduate medical education, Republic of Uzbekistan
[2]Urgench branch of Tashkent Medical Academy, Republic of Uzbekistan
[3]Tashkent Pediatric Medical Institute, Republic of Uzbekistan

Abstract— The effectiveness of therapeutic and preventive measures in relation to cardiovascular diseases depends largely on their early detection and subsequent treatment and prevention. The most accessible and widely used methods of HDD diagnostics during mass preventive examinations of the population is a survey to identify the pain syndrome and an ECG study. Adequate assessment of these indicators is an important prerequisite for early detection, effective prevention, and treatment of CHD, as well as the prevention of premature mortality of patients. Objective: To assess the significance of pain syndrome and ischemic changes on ECG in the formation of "endpoints" among patients with CHD by studying mortality and new cases of this disease. Methods: a representative sample of the unorganized male population of 20-69 years of Tashkent city in the number of 1332 people, including 167 patients with coronary heart disease (CHD), was examined. For 12 years, they were followed prospectively and studied the causes of death. Results: among those who did not have CHD at the start of the study, mortality from this disease within 12 years was 3.35%, among those with ischemic changes on the ECG – 22.0%, and among those without ischemic changes on the ECG, but with pain syndrome - 17.6%. The highest mortality from CHD-35.29% occurred among patients who combined ischemic changes on the ECG with pain syndrome. Conclusion: Ischemic changes on the ECG are a more important prognostic sign of mortality risk from coronary heart disease than pain syndrome. The significance of ischemic changes on the ECG as a risk factor for the formation of endpoints is significantly increased in combination with pain syndrome.

Index Terms— coronary heart disease, pain syndrome, electrocardiography, endpoints, mortality, stable exertional angina, cerebral stroke.

————————————— ◆ —————————————

1 INTRODUCTION

The concept of reforming the health care system of Uzbekistan provides for further improvement of work to preserve and strengthen the health of the population. Timely detection and prevention of diseases is a priority of modern health care. To improve the effectiveness of the prevention of chronic non-communicable diseases in Uzbekistan, the main directions of medical science and practice include measures to develop and implement targeted programs for the formation of a healthy lifestyle, prevention, and control of noncommunicable diseases and their risk factors.

The success of this work is largely determined by the effectiveness of treatment and diagnostic programs for early detection and elimination of a number of factors contributing to the formation and deterioration of the clinical course of various diseases of internal organs. In the structure of diseases of internal organs, one of the main places is occupied by diseases of the endocrine and cardiovascular system. In this regard, it is important to determine the range of risk factors for premature mortality. At the same time, the question of prognostic significance of clinical symptoms of coronary heart disease and ischemic changes on ECG in mortality from myocardial infarction and cerebral stroke is of practical interest.

2 LITERATURE REVIEW

Coronary heart disease (CHD) is considered the leading cause of death worldwide. However, the prevalence of CHD in different countries of the world may differ [1]. Differences in prevalence, differences in clinical course, disability, and mortality of patients are influenced mainly by various risk factors and lifestyles of patients [2, 3]. It is known that in many developed countries (taking into account age), mortality from CHD has decreased [2]. At the same time, in Japan, there is a decrease in mortality despite the increase in the incidence of obesity, cholesterol levels, and modern changes in nutrition. According to many studies – in Russia, the United States, and Ukraine, there is a high mortality rate. At the same time, in such countries as the UK, USA, Brazil, Kazakhstan in the period from 2005 to 2015, there is a decrease in mortality from CHD [1].

One of the predictors and causes of premature mortality are changes in the electrocardiogram. The study in Lithuania revealed a tendency to decrease the prevalence of ECG ischemia in women and men - a tendency to increase the prevalence of left VH [4]. These ECG abnormalities were closely associated with a high risk of mortality from CVD. Using this information

can improve the prognosis of mortality from CVD. Among the risk factors for heart failure in the first place is hypertension, which precedes it in 75% of patients [5]. Left ventricular hypertrophy, which develops as an adaptive response, can serve as a predictor of cardiovascular disease and mortality.

The main components of the metabolic syndrome have a significant impact on the hard "endpoints" [6]. It was found that many patients underestimate the role of these factors in the development of stroke [7]. At the same time, previous pain symptoms and ischemic changes on the ECG are of great importance in the development of "hard endpoints".

3 MATERIALS AND METHODS

A representative sample of the unorganized male population of 20-69 years of Tashkent city in the number of 1332 people, including 167 patients with coronary heart disease (CHD), was examined. For 12 years, they were monitored and studied the causes of death. The following causes of death have been recorded: coronary heart disease; brain stroke, other than the above diseases ("Others"). Mortality rates were studied relative to the total number of deaths in each of the groups considered.

The survey revealed typical angina according to the questionnaire (Rose, 1984). The group with CHD also included persons who had previously experienced severe pain, penetrating the chest from front to back and lasting more than 30 minutes, in the absence of ECG signs of myocardial infarction. Since the introduction of electrocardiography into practice, this diagnostic method is used in most patients with cardiovascular diseases. At the same time, a more accurate method of echocardiography is also widely used for diagnosis [9]. Nevertheless, the method of electrocardiography, as more affordable and economical, continues to be used in primary health care and mass preventive examinations of the population.

Electrocardiograms were evaluated from the Minnesota code (MC). According to this code revealed: a) "certain" myocardial infarction - in the presence of ECG categories 1-1,2 MK; b) typical angina - with a positive response to the Rose questionnaire and in the absence of ECG categories 1-1,2; MK; c) pain –free form of CHD - in the presence of ECG categories 4-1,2; 5-1,2 MK (reduced segment "ST" and negative "T" wave), without hypertrophy of the left ventricle (category 3-1,2,3 MK) and the absence of "certain" myocardial infarction and angina tension; d) "possible" CHD according to the ECG - includes "possible" myocardial infarction by ECG (type I-2-8, I-3 MK), for possible myocardial ischemia (category 4-3, 5-3MK), arrhythmic shape, including impairment in A conduction I-2 extent a complete blockade of the left bundle branch block, atrial fibrillation (category 6-1, 2; 7-1; 8-3 MK), ischemia with left ventricular hypertrophy (categories 4-1,2; 5-1,2 3-1,3 MC) in the absence of cicatricial changes on ECG, and typical angina; e) "possible" history of myocardial infarction according to who cardiac examination in the absence of the above categories of CHD.

4 RESULTS

The success of primary and secondary prevention of CHD is largely determined by an adequate assessment of the various clinical symptoms and ischemic ECG changes. In assessing the significance of various factors in the outcomes of CHD, it is important to study their impact on mortality from this disease. In this regard, the endpoints of CHD (mortality and new cases) among individuals who had stable exertional angina (SEA) and ischemic changes on ECG at the start of the study were studied.

According to the obtained data (table.1), 11.76% died of Myocardial Infarction (MI) among those who had NO ischemic changes on the ECG during this period. At the same time, among those who had ischemic changes on the ECG, but did not have THEM, the mortality from MI was almost two times higher (22.0%). The greatest mortality from MI is observed in the group of persons who had a combination of ECG changes with SEA (35.29%). It should be noted that among those who did not have at the start of the study of ischemic changes on the ECG and SEA, there was no cause of death from MI.

Table 1

Mortality from myocardial infarction and brain stroke depending on the presence of stable exertional angina and changes on the ECG (%)

| Cause of death | CHD no (n=1165) | The presence of stable exertional angina and ischemic changes on the ECG at the start of the study | | | |
		CHD without ischemic changes on ECG (n=16)	CHD with ischemic changes on ECG (n=100)	SEA without ischemic changes on ECG (n=34)	SEA with ischemic changes on ECG (n=17)
Heart attack	3,35 *	0	22,00 *	11,76	35,29 *
Cerebral stroke	2,40	6,25	5,00	11,76	0
Other reason	7,30	12,50	15,00	8,82	0
Survivor	86,95	81,25	58,00	67,66	64,71
TOTAL	100	100	100	100	100

Note: the table shows the validity of the differences relative to the group deaths from other causes (*)

From the data presented, it can be concluded that ischemic changes on the ECG are a stronger predictor of MI mortality than a typical pain syndrome. However, the highest risk of death from MI occurs in patients with a combination of pain syndrome and ischemic changes on the ECG. Stroke mortality was more common among individuals with stable exertional angina than with ischemic ECG changes.

Of particular interest was the question of the share of MI

mortality in the overall mortality structure in the presence of pain syndrome and ischemic changes on the ECG. The analysis of the obtained data showed (table.2) that among the surveyed persons, 33.18% died of MI in 12 years, 17.76% died of brain stroke, and 49.07% died of other causes. Thus, almost every second death in the population is associated with MI or brain stroke, and every third with MI. Among those who suffered from CHD at the start of the study, 51.61% died of MI during the follow-up period, i.e., one in two CHD patients died from MI, and 16.13% died from a brain stroke. Another 32.26% died from other diseases. The share of CHD in the total mortality structure among persons with ischemic changes on ECG was more than half (52.38%), and among persons with stable exertional angina, but without ischemic changes on ECG – 36.36%. (i.e., almost every third case).

Table 2.

The share of coronary heart disease in the overall structure of mortality among individuals who at the start of the study had ischemic changes on ECG and stable exertional angina (%)

CHD, SEA and ischemic changes on ECG at the start of the study among the subsequently deceased individuals	Причины смерти			
	MI	Stroke	Other	All
CHD no (n=152)	25,66	18,42	55,92	100
CHD without ischemic changes on ECG (n= 3)	-	33,33	66,67	100
CHD with ischemic changes on ECG (n = 42)	52,38 *	11,90	35,72	100
ECG changes without SEA (n = 11)	36,36	36,36	27,28	100
ECG changes with SEA (n = 6)	100	-	-	100
CHD in general (n-62)	51,61 *	16,13	32,26	100
TOTAL (n = 214)	33,18	17,76	49,06	100

Note: the table shows the validity of the differences relative to the group of deaths from other causes (*)

An important scientific and practical fact has been established: among those who had ischemic ECG changes at the start of the study in combination with a typical pain syndrome, the share of MI in the overall mortality structure was 100% (!). It should be noted that among those who did not suffer at the start of the CD study, the mortality rate for CD in the overall structure was 25.66% (i.e., every fourth case). This fact can be explained by the fact that within 12 years among this group of persons developed CHD, which later served as a cause of death.

5 CONCLUTION

Pain syndrome, as well as ischemic changes on the ECG, are important precursors of mortality from MI and Stroke. However, ischemic changes on the ECG are a more important prognostic sign of mortality risk from coronary heart disease than pain syndrome. Earlier publications have shown that pain syndrome in CHD patients is associated with major components of metabolic syndrome [10].

REFERENCES

[1] Alexandra N. Nowbar, Mauro Gitto, James P. Howard, Darrel P. Francis, Rasha Al-Lamee. Mortality From Ischemic Heart Disease /Circulation: Cardiovascular Quality & Outcomes, June 2019. DOI: 10.1161/circoutcomes.118.005375

[2] Soshiro Ogataak, Kunihiro Nishimura, MariaGuzman-Castilloc et al. Explaining the decline in coronary heart dis-ease mortality rates in Japan: Contributions of changes in risk factors and evidence-based treatments between 1980 and 2012. / International Journal of Cardiology. Volume 291, 15 September 2019, Pages 183-188.

[3] Global Health Estimates 2016: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2016. Geneva, Switzerland: World Health Organization; 2018. http://www.who.int/healthinfo/global_burden_disease /estimates/en/ Accessed November 16, 2018.

[4] Abdonas Tamosiunas, Janina Petkeviciene, Ricardas Radisauskas et al. Trends in electrocardiographic abnormali-ties and risk of cardiovascular mortality in Lithuania, 1986–2015. /BMC Cardiovasc Disord. 2019; 19: 30. Published online 2019 Jan 30. doi: 10.1186/s12872-019-1009-3.

[5] Whelton PK, Carey RM, Aronow WS, Casey DE et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a Report of the American College of Cardiology/American Heart Association Task Force on Clinical Prac-tice Guidelines. Hypertension. 2018; 71:e13–e115.

[6] Kayumov U.K., Kalandarova U.A., Ibadova M.U., Ismatova M.N. The formation of a hard "end points" for various risk factors. /Journal of Biomedicine and Practice. ISSN 2181-9300. 2019. vol.1. - P. 79-84. DOI:10.26739/2181-9300. http://tadqiqot.uz/wp-content/uploads/2019/05/biomedicine-2019-1/biomedicine-2019-01.pdf

[7] Kalandarova U.A., Nuritdinov Sh.F., Nurmukhamedova D.E., Kayumov U.K. Patients ' opinions on some components of metabolic syndrome as risk factors for stroke // Neurology. – Tashkent, 2019. - №4 (80). - P.27-30.

[8] Keith C. Ferdinand, and Carola Maraboto. Is Electrocardiography-Left Ventricular Hypertrophy an Obsolete Marker for Determining Heart Failure Risk With Hypertension? / Journal of the American Heart Association. 2019;8:e012457. Apr 2019. https://doi.org/10.1161/JAHA.119.012457

[9] Giuseppe Mancia, Robert Fagard, Krzysztof Narkiewicz, Josep Redon, Alberto Zanchetti, Michael Böhm, Thierry Christiaens, Renata Cifkova, Guy De Backer et al. 2013 ESH/ESC Guidelines for the management of arterial hy-

per-tension: The Task Force for the management of arteri-al hyper-tension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). /European Heart Journal, Volume 34, Issue 28, 21 July 2013, Pages 2159–2219, https://doi.org/10.1093/eurheartj/eht151

[10] Prodolzhitel'nost' bolevogo pristupa u bol'nyh ishem-icheskoj bolezn'yu serdca pri nalichii otdel'nyh kompo-nentov metabolicheskogo sindroma. /Kayumov U.K., Hatamova D.T., Saipova M.L., Badritdinova M.N., Alimov S.S., Ismailov K.YA. // Kardiologiya Uzbekistana. 2007.-№3. – S. 47-50.

IJSER