

Modern Concepts on the Effect of Alcohol Intoxication on the Activity of the Heart

Xotamova Sarvinoz Muyitdinovna

Bukhara state medical institute

Article Information

Received: March 23, 2023

Accepted: April 22, 2023

Published: May 25, 2023

Keywords

*alcoholic intoxication,
damage, heart.*

ABSTRACT

According to World health organization statistics, heart disease has been the leading cause of death for over 20 years. Heart disease today accounts for 16% of all deaths in the world. Since 2000 the number of deaths from cardiovascular diseases increased by more than 2 million and in 2019 reached almost 9 million. The purpose of this article is to analyze, summarize and draw conclusions from the information provided by the authors.

Introduction

The Federal State Statistics Service (Rosstat-2011) in Muscovites identified the cause of death from alcohol associated with damage to the following organs of alcoholic liver disease - 36.8%, alcoholic cardiomyopathy - 33.2%, degeneration of the nervous system caused by alcohol - 12.4%.

For Russia, the abuse of alcoholic beverages is becoming a national disaster. At the same time, it is impossible to take into account the number of surrogates and falsified alcohol, which is quite widespread (Nemtsov A.V. 2007). In addition, statistics calculate alcohol consumption per capita, that is, including children, women and the elderly. And yet, alcohol consumption in Russia is 14.5 liters per capita.

At the same time, chronic alcohol intoxication (CAI), in addition to independent medical and social significance, contributes to the emergence, recurrence and progression of somatic diseases that suffer from people who abuse alcohol. Annually mortality in Russia from diseases associated with alcohol abuse reaches 700 thousand, and about 40 thousand die from poisoning with alcohol surrogates in the country (Nemtsov A.V. 2007).

According to Yu.P. Lisitsyn et al (1990) AR Lingford-Hughes at all. (2003), alcohol abuse attracts the attention of doctors only when patients develop alcoholism, characterized by physical

mental dependence on alcohol and severe mental disorders. At the same time, it is not taken into account that behind the vivid manifestation of alcoholism there are many years of alcohol abuse, which is not accompanied by alcohol dependence and severe mental symptoms and is called "drunkenness".

Recovering from alcoholism, according to many psychiatrists, occurs only in 3-5% of cases, and despite the efforts of psychiatrists and narcologists from all over the world, Paukov V.S. et al. (2004) cannot get the problem out of the dead end. In addition, even those "cured of alcoholism" retain severe changes in almost all internal organs. This happens because before the development of alcoholism, a person goes through a long period of CAI, during which changes develop and progress in the organs and systems of the body. For many years they remain compensated and do not have pronounced symptoms. Only when the compensatory and adaptive capabilities of the organism are exhausted do psycho-pathological symptoms and the clinic of alcoholism appear. That is why the concept of alcoholism does not reflect the breadth of the pathogenesis of CAI and requires a different interpretation of the disease caused by long-term alcohol abuse. Understanding this led us to the need to develop new concepts of alcoholic disease (AD) as suffering with a much longer and more diverse patho and morphogenesis of alcoholism.

Tarasova OI, (2007) ., Paukov V.S. et al. (2019). determined at the same time, analyzing the pathogenesis and morphogenesis of AD, it should be borne in mind that ethanol is a normal metabolite of the body, it participates in the metabolism of lipoproteins and phospholipids, increasing the level of high and very high density lipoproteins, regulates cholesterol metabolism, as well as the synthesis of cell and intracellular membranes ... When the possibility of basal liver metabolism is exceeded, alcohol metabolites, primarily acetaldehyde, enter the bloodstream, which have a damaging effect on various structures of the body, primarily on the vessels of the microvasculature, as well as on cells of all organs and membranes of intracellular structures.

T.A. Golovanova (2012) studied the physiological properties of cardiomyocytes in the culture of myocardial cells of newborn rats. Found that the culture imitates the processes of cessation of division and the transition from hyperplasia to hypertrophy of myocardial cells. Under the conditions of primary culture of myocardial cells in adult rats, he revealed the proliferative activity of resident stem cells, but established their reduced capacity for cardiomyogenesis.

In clinical experiments on animals and on an isolated heart preparation Belovitsky O.V. (2008) found that ethanol reduces the size of the zone of myocardial ischemia, reduces the severity of electrographic changes and has a powerful antiarrhythmic effect in occlusion of the coronary artery

The study of P O Ettinger (1976) revealed, when modeling alcoholism in dogs, the HQ interval time increased by 9 m / s, and the QRS complex expanded by 18 m / s. These changes are rare when taken for a short period of time, do not appear at all when exposed to acute alcohol and are not associated with ventricular hypertrophy, necrosis, inflammation. Long-term alcohol consumption even with proper nutrition, visible disturbances in ventricular conduction and morphological changes are due to the stable toxic effect of ethanol.

The study of N.V. Shlyakhtin (2009) revealed the nature of the relationship about the increase in the severity of alcohol intoxication with the systolic and diastolic function of the left ventricular myocardium. Found a dependence of changes in heart rate turbulence indicators, namely an increase in Turbulence onset and a decrease in Turbulence slope, associated with the severity of acute alcohol intoxication.

Histochemical parameters (E.I. Bystrova 2009), activity of alcohol-oxidizing enzyme systems using computerized quantitative morphometry in cases of sudden death from ACMP (alcoholic cardiomyopathy) and IHD (ischemic heart disease) in comparison with rapid death from mechanical injury.

According to E.V. Kuznetsov (2013) macroscopic and organometric analysis of the heart in chronic combined intoxication with opiates and ethanol, which made it possible to reveal an increase in the mass and size of the heart, the height and width of both atria and ventricles, changes in the ventricular and cardiac indices. He found that with chronic combined intoxication with opiates and ethanol, pathomorphological changes develop, indicating the formation of secondary toxic cardiomyopathy in psychoactive substance users.

Development of ethanol tolerance in the experiment Luis M at all (2004) assessed body temperature and recovery of two reflexes after a high dose of ethanol in rats receiving chronic and acute ethanol consumption. The animals have previously been exposed to chronic or acute alcohol use. The results showed that 56-day-old animals developed greater tolerance with moderate to acute ethanol consumption. However, tolerance to the effects of motor impairment did not develop, as all groups took a long time to recover reflexes.

In chronic alcoholism, the amount of trace elements in the blood, especially potassium, decreases. Moses Elisaf at all. (2002).

Paukov V.S., et al. (2004) identified a lot of adipose tissue under the endocardium and around the intramural vessels in alcoholics. In the coronary arteries and in their branches there are flat atherosclerotic plaques, stenosing vascular lumens by 35–50%; sclerosis of their walls is expressed. In the vessels of microcirculation, hyalinosis, widespread, although irregular atrophy and desquamation of endothelial cells, stasis and sludge of erythrocytes. Plasmorrhage and fibrinoid necrosis of the vessel walls, perivascular edema, and diapedetic hemorrhages, especially in ethanol poisoning, were noted. The number of microcirculatory vessels is reduced. The myocardium is flabby, the heart cavities are stretched, the endocardium is thickened and sclerosed. Sometimes in cardiomyocytes, alcoholic hyaline was detected in the form of Mallory's little bodies, or "rod-shaped inclusions." Fatty degeneration and lipofuscinosis of muscle cells are expressed. Hypertrophied cardiomyocytes alternated with areas of muscle fiber atrophy. There are many foci of overcontraction and fragmentation of myofibrils, especially in those who died in a state of alcoholic delirium. In cases of sudden death from alcohol poisoning, there was a disappearance of the transverse striation of myofibrils as a result of melting of the Z discs, multiple foci of myocytolysis with lymphoid cell infiltration. All those who died in cardiomyocytes showed swelling of mitochondria, pronounced fragmentation of their cristae, blurred, indistinct membranes of intracellular structures. The amount of glycogen granules in the sarcoplasm is sharply reduced. The number of damaged cardiomyocytes was almost 1.5 times higher than their number in the myocardium of those suffering from drunkenness and increased by 6.2 times in comparison with the myocardium of the deceased from the control group. In all observations, diffuse focal cardiosclerosis was noted, the total area of which was $28 \pm 0.5\%$, which is significantly 1.4 times more than in those suffering from drunkenness.

In acute heart attack against the background of alcohol intoxication A.G. Reznik (2013) found: obesity of the myocardial stroma, atrophy of cardiomyocytes along with their hypertrophy and the disappearance of striated striation. In muscle cells, areas of significant lysis of myofibrils, the presence of large vacuoles, dilatation of the tubules of the sarcoplasmic reticulum, mitochondriosis, lipid infiltration of cardiomyocytes, and the accumulation of

lysosomal formations are revealed. Some kernels can be small and pycnotic, while others are oversized and bizarre in shape.

In most cases, myocardial hypertrophy is detected in dilated cardiomyopathy, as a rule, it is accompanied not only by the flattening of the apex of the heart, as a result of which the heart acquires a spherical shape, but also by a uniform expansion of all its cavities. On the contrary, the same macroscopic sign in alcoholic cardiomyopathy is accompanied by expansion of only the left ventricle of the heart (Sokolova O.V. 2018).

The most important and characteristic macroscopic sign of alcoholic heart disease is its obesity, manifested in the form of a pronounced proliferation of epicardial adipose tissue (Moiseev V.S. et al., 2012). This feature distinguishes alcoholic cardiomyopathy from other types of cardiomyopathy. However, an increase in the amount of epicardial fatty tissue may not be associated with alcohol consumption, but may be a manifestation of both general constitutional obesity and concomitant endocrine pathology. For alcoholic cardiomyopathy, typical in this case is the presence of a yellowish tint of the myocardium on the cut, associated with the development of parenchymal and mesenchymal fatty degeneration, caused by the constant long-term toxic effect of ethanol and its metabolites (Pigolkin Yu.I., Morozov Yu.E. et al., 2012).

The study found that secondary vascular collapse of a toxic nature is due to depletion of the compensatory-adaptive functions of the circulatory system under the influence of hypoxia, a decrease in coronary artery perfusion, shock, endogenous intoxication syndrome and hepatic dysfunction. The developing circulatory disorders are often accompanied by disturbances in the activity of the heart, which are based on the onset of the low emission syndrome caused by the direct cardiodepressive effect of ethanol and associated with the development of acute toxic myocardial dystrophy. This syndrome is manifested by a drop in the contractile function of the myocardium and a reduction of the VCB (volume of circulating blood). Toxic myocardial dystrophy occurs as a result of a sharp disruption of energy processes in the myocardium, provoked by the cardiotoxic action of acetaldehyde, acetate and catecholamines.

According to scientists, morphological changes in the heart detected in alcoholic and dilated cardiomyopathies are not specific signs that allow differential diagnosis.

Thus, the authors provided a lot of literary information about the features of the morphofunctional structure of cardiomyocytes of the heart in alcoholism, but experimental studies of the morphogenesis of the cardiac conduction system of rats in postnatal ontogenesis are insufficiently sanctified and contradictory. The study of morphofunctional changes in the conduction system of the heart in alcoholism, as well as methods for their diagnosis and correction, remains an urgent problem.

References:

1. Немцов А В. Алкоголизм в России: история вопроса, современные тенденции. Журнал неврологии и психиатрии им. С.С. Корсакова. 2007; Прилож. 1:3–7.].
2. Немцов А В., Терехин АТ. Размеры и диагно-стический состав алкогольной смертности в России. Наркология. 2007;6(12):29–36.].
3. Лисицын Ю.П., Сидоров П.И. Алкоголизм. Медико-социальные аспекты. М.: Медицина; 1990. 528 с.].
4. Lingford-Hughes AR, Davies SJ, McIver S, Williams TM, Daglish MR, Nutt DJ.

- Addiction. Br Med Bull. 2003;65:209–22. doi: 10.1093/bmb/65.1.209.,
5. Пауков ВС, Ерохин Ю А. Патологическая анатомия пьянства и алкоголизма. Архив патологии. 2004;66(4):3–9.
 6. Резник А.Г. Судебно-медицинская оценка патоморфологических изменений сердца при остром инфаркте миокарда на фоне алкогольной интоксикации [Текст] / А.Г. Резник // Международный журнал прикладных и фундаментальных исследований. – 2013. – № 11(1). –С. 65-67.
 7. Тарасова О И, Огурцов П П, Мазурчик Н В, Моисеев ВС. Современные лабораторные маркеры употребления алкоголя. Клиническая фармакология и терапия. 2007;16(1):10–5.,
 8. Пауков В С, Кириллов Ю А, Чернов И А, Штемплевская ЕВ. Современный взгляд на тельца Мэллори. Клиническая и экспериментальная морфология. 2019;8(4):5–12. doi: 10.31088/СЕМ2019.8.4.5-12.
 9. Голованова Т.А. Функциональные свойства культивируемых клеток сердца крыс: зрелых кардиомиоцитов, стволовых клеток и клеток предшественников :автореф.дис./ Т.А Голованова Санкт-Петербург 2012 С 5-6
 10. Беловицкий О.В. Иммуногистохимические маркёры апоптоза при алкогольно - наркотических интоксикациях / О.В. Беловицкий // Таврический медико - биологический вестник. – 2008. – №1. – С. 118 –122.
 11. P O Ettinger (Cardiac conduction abnormalities produced by chronic alcoholism)American Heart Journal Volume 91, Issue 1, January 1976, Pages 66-78
 12. Шляхтина Н.В. Функциональное состояние проводящей системы сердца и контр активная функция миокарда у больных с острой алкогольной интоксикацией :автореф.дис./ Н.В. Шляхтина Новосибирск 2009 С 4-5
 13. Быстрова Е.И. Алкогольокисляющие ферментные системы в судебно-медицинской диагностике скоропостижной смерти от алкогольной кардиомиопатии и ишемической болезни сердца :автореф.дис./ Е.И.Быстрова МОСКВА – 2009 С 5
 14. Кузнецов Е.В Морфология сердечной
 15. Akhtamovna K. N., Muyitdinovna K. S. Ischemic Heart Disease in Path Anatomic Practice: Cardio Sclerosis //European Multidisciplinary Journal of Modern Science. – 2022. – Т. 5. – С. 402-406.
 16. Xatamova Sarvinoz Muyitdinovna. (2022). THE ROLE OF HYPERHOMOCYSTEINEMIA IN THE DEVELOPMENT OF COGNITIVE IMPAIRMENT IN CHRONIC CEREBRAL ISCHEMIA. *Web of Scientist: International Scientific Research Journal*, 3(9), 421–428. <https://doi.org/10.17605/OSF.IO/P4W69>
 17. Xotamova Sarvinoz Muyitdinovna. (2022). THE ROLE OF HYPERHOMOCYSTEINEMIA IN THE DEVELOPMENT OF COGNITIVE DISORDERS IN CHRONIC BRAIN ISCHEMIA. *Web of Scientist: International Scientific Research Journal*, 3(8), 442–453. <https://doi.org/10.17605/OSF.IO/K9FW8>
 18. Muyitdinovna, K. S. . (2022). Ovarian Cysts in Women of Reproductive Age. *AMALIY VA TIBBIYOT FANLARI ILMIIY JURNALI*, 1(7), 225–228. Retrieved from <https://sciencebox.uz/index.php/amaltibbiyot/article/view/5071>

19. Khatamova Sarvinoz Muyitdinovna. (2022). OCCURRENCE OF LIVER CIRRHOSIS IN FORENSIC MEDICAL PRACTICE AND STATISTICAL ANALYSIS. *Web of Scientist: International Scientific Research Journal*, 3(11), 1308–1317.
20. Shodiev O'lmas Mustafoevich, Olimova Aziza Zokirovna. РЕПРОДУКТИВ ЁШДАГИ ЭРКАКЛАРДА БЕПУШТЛИК САБАБЛАРИ: БУХОРО ТУМАНИ ЭПИДЕМИОЛОГИЯСИ. SCIENTIFIC PROGRESS. 2021 й 499-502р
21. O'lmas Mustafoevich Shodiev (2021/11/29) Pathologies encountered in the kidney in the practice of forensic medical examination. *Journal. Academicia globe: Inderscience Research*. № 2(11) P. 39-43
22. Shodiev O'lmas Mustafoevich, Expression level of anti-apoptotic protein Bcl-2 in bladder papillomas(2022/8/13).*Web of Scientist: International Scientific research Journal*. № 3(8) P. 297-305
23. Shodiev O'lmas Mustafoevich, Khaidarova Nargiza Akhtamovana (2022/6/19) EPITHELIAL SAFE TUMORS OF BLADDER RATE, TYPES AND CAUSES. *Web of Scientist: International Scientific research Journal*. № 3(6) P. 905-912
24. Shodiev O'lmas Mustafoevich, Khaidarova Nargiza Akhtamovana (2022/6/19). MEETING OF KIDNEY CYSTERS IN COURT MEDICAL AUTOPSY PRACTICE. *Web of Scientist: International Scientific research Journal*. № 3(6) P. 893-898
25. Shodiev O'lmas Mustafoevich, Khaidarova Nargiza Akhtamovana (2022). Epitelial safe tumors of bladder rate,types and causes. *Web of Scientist: International Scientific research Journal*. № 3(6) P. 905-912.
26. Van Gelder A comparison of rate control and rhythm control in patients with recurrent persistent atrial fibrillation/Van Gelder[et al.] // *N. Engl. J.Med.* 2002. Vol. 347 (23). P. 1834-184
27. Khaidarova Nargiza Akhtamovna, Khotamova Sarvinoz Muyitdinovna. Ischemic Heart Disease in Path Anatomic Practice: Cardio Sclerosis // *EUROPEAN MULTIDISCIPLINARY JOURNAL OF MODERN SCIENCE*. Volume 5 (2022) 402-406
28. Aziza Zokirovna Olimova, (2021, July). COMPARATIVE CHARACTERISTICS OF THE MORPHOLOGICAL PARAMETERS OF THE LIVER AT DIFFERENT PERIODS OF TRAUMATIC BRAIN INJURY. In *Euro-Asia Conferences* (pp. 139-142).
29. Aziza Zokirovna Olimova. Частота Встречаемости Миомы Матки У Женщин В Репродуктивном Возрасте. *JOURNAL OF ADVANCED RESEARCH AND STABILITY (JARS)*. Volume: 01 Issue: 06 | 2021. 551-556 p
30. Aziza Zokirovna Olimova, Sanoyev Bakhtiyor Abdurasulovich. OVARIAN DISEASES IN AGE OF REPRODUCTIVE WOMEN: DERMOID CYST. Volume: 01 Issue: 06 | 2021. 154-161 p
31. Aziza Zokirovna Olimova. РЕПРОДУКТИВ ЁШДАГИ ЭРКАКЛАРДА БЕПУШТЛИК САБАБЛАРИ: БУХОРО ТУМАНИ ЭПИДЕМИОЛОГИЯСИ. SCIENTIFIC PROGRESS. 2021 й 499-502р
32. Aziza Zokirovna Olimova. MACRO- AND MICROSCOPIC STRUCTURE OF THE LIVER OF THREE MONTHLY WHITE RATS. *ACADEMIC RESEARCH*

IN EDUCATIONAL SCIENCES /2021 й. 309-312 p

33. Sanoyev Bakhtiyor Abdurasulovich, Olimova Aziza Zokirovna. Pathology of Precancerous Conditions of the Ovaries in Women of Reproductive Age. Volume: 01 Issue: 06 | 2021.
34. Aziza Zokirovna Olimova. Cytological screening of cervical diseases: pap test research in the bukhara regional diagnostic center for the period 2015-2019 // Web of Scientist: International Scientific Research 3 (7), 2022, 121-128
35. OA Zokirovna Technique for cutting biopsy and surgical material in the practice of pathological anatomy and forensic medicine // Web of Scientist: International Scientific Research Journal 3 (7), 2022, 116-120