

## Alcohol and Lungs

*Khushnud Yoqubovich Kamolov<sup>1</sup>*

**Abstract:** The article presents the available information about the effect of alcohol on the respiratory system. Particular attention is paid to the mechanisms of the damaging effect of alcohol, morphological changes in the lungs, and the features of the course of a number of respiratory diseases in people who drink alcohol excessively are described. In an animal experiment, it was found that excessive consumption of ethanol leads to dysfunction of the mucociliary apparatus and to dysfunction of alveolar macrophages, which will lead to impaired clearance of the lower respiratory tract, and is the cause of chronic respiratory failure.

**Keywords:** chronic alcoholism, rats, lungs, bronchial tree, experiment.

**Relevance.** Alcohol abuse is one of the most important problems of modern society. In practical healthcare, its solution is assigned to narcologists, whose efforts are aimed at suppressing the mental and physical dependence on alcohol. At the same time, little attention is paid to damage to internal organs. Alcohol mortality is not limited to alcohol poisoning and death from violent causes (murder, suicide), it includes a significant percentage of deaths from alcohol-related somatic pathology [4]. Moreover, in the last few years, the structure of alcohol mortality has seen an increase in this particular indicator [5]. Mortality from alcohol intoxication has taken third place in the world, behind cardiovascular and oncological. The only exceptions are alcoholic cardiomyopathy and liver damage in alcoholism, the pathogenesis and morphogenesis of which has been intensively analyzed, especially in recent years [1-24,]. Lung pathology has been studied to a lesser extent, although it is respiratory diseases that occupy the first place in the structure of the general morbidity of people who abuse alcohol [25,27,28]. Chronic inflammatory diseases of the respiratory organs account for about 7% of the total morbidity structure; among the causes of death, they take the 4th place after cardiovascular, oncological diseases and injuries. [2,4,5,8,29]. Many researchers believe that in the pathology of the lungs in patients with alcoholism, the leading place belongs to chronic nonspecific diseases [9-14,17-27].

Studies carried out in this direction, in the dynamics of the formation of chronic alcohol intoxication, allow us to determine that a single use of a moderate dose of ethanol in the development of pneumonia is of no small importance, little work has been done aimed at determining the amount of ethanol administered or the duration of its use as risk factors, for reduction against infection resistance of the lungs. However, a clear concept of the state of various links against infectious resistance of the lungs in alcohol intoxication has not yet been identified. The respiratory system as a whole seems to be a target for chronic alcohol abuse.

**The purpose of the work:** The purpose of this study was to study in the experiment, the characteristic pathomorphological changes in the respiratory organs in chronic alcoholism in rats.

**Materials and methods:** The study was conducted on 25 white outbred rats weighing 180-210 g. The animals were divided into 2 groups, group I served as a control in the amount of 10 rats, which were injected with intragastric saline. Animals of the II experimental group in the amount of 15 rats were injected intragastrically once with a solution of ethanol at a dose of 7 mg/kg/day of body weight. Animals were killed 3, 7, 15, 30 days after exposure to ethanol and were removed from the experiment at 3 months of age by instant decapitation of animals under ether anesthesia. The lung extracted from the chest was fixed in 10% formalin solution and embedded in paraffin according to generally accepted rules. Next, histological sections were prepared with a thickness of 6-7  $\mu\text{m}$ , which were stained with hematoxylin and eosin. Morphological studies of lung tissue were studied under a Leica microscope.

Results of own research and discussion. Microscopic examination of the lung in the early stages in the parenchyma revealed: in the lumen of large and small bronchi, the folding of the mucous membrane, characteristic of intact animals, was noted, the presence of edema, dyscirculatory disturbance, the cellular composition was found to disintegrate lymphocytes in the form of karyopyknosis and karyolysis. Histologically, on the 15th day of daily exposure to ethanol, acute processes develop (edema, thickening and infiltration of the mucosa, expansion of the lymphatic vessels, increased bronchial secretion), which is reflected by the presence of foci of acute ephysema, spasm of small arterioles.

On the 30th day after the introduction of ethanol, there was a pronounced dysfunction of alveolar macrophages, immune cells incapable of phagocytosis. Structural changes in cells included loss of cilia and metaplasia. We also found an increase in the number and size of dystrophic changes in the epithelium of the bronchial glands, more abundant lymphoid cell infiltration of the stroma with fibrosis and sclerosis in the lung tissue, microcirculation disorders in the lungs. Signs of chronic bronchitis and bronchiolitis of varying degrees were found in the bronchi, and the number of goblet cells was also increased. In an experiment on rats, it was found that excessive consumption of ethanol leads to dysfunction of the mucociliary apparatus and dysfunction of alveolar macrophages, which leads to impaired clearance of the lower respiratory

<sup>1</sup> Bukhara Medical Institute

tract, and is the cause of chronic respiratory failure. Against the background of taking ethanol, there was also a violation of ventilation, diffusion and pulmonary blood flow.

In an experiment on rats, it was found that oral ethanol has a short-term effect on lung tissue and causes aspiration pneumonia, and the drainage function of the bronchi and atrophy of the ciliated epithelium were also impaired.

**Conclusions:** Assessing the morphological changes that occur in the lung tissue during prolonged exposure to ethanol, we can draw the following conclusions: 1. The pathological process occurs simultaneously and develops in parallel in all lung structures. 2. After 15 days of exposure to ethanol, an acute process develops, morphological changes correspond to the subacute stage, after 30 days the inflammatory process becomes chronic with subsequent progression. 3. In the acute and subacute period, the morphological substrates of bronchial obstruction are swelling of the mucosa and submucosa, its thickening due to infiltration, increased bronchial secretion and bronchospasm.

Thus, this study shows that the study in this direction is of fundamental importance for the development of new approaches in the prevention and treatment of lung diseases in patients with alcoholism. In conclusion, I would like to note that researchers and clinicians have only begun to study the problem of alcohol damage to the respiratory system. This gives hope that in the relatively near future the negative effects of alcohol on the health of the respiratory system can be significantly reduced.

It can be argued that the combined course of respiratory diseases and alcoholism is an urgent task of modern medicine.

### Literature.

1. Авдеева Т.Г. Влияние алкоголизма матери на состояние здоровья новорожденного / Т.Г. Авдеева, И.Л. Алимova // Педиатрия. - 1994. - №5. - с. 57-58.
2. Алехина И.П. Наследственный алкоголизм: некоторые нейрохимические и генетические механизмы / И.П. Алехина, А.Г. Вертинская, Н.Л. Векшина // Вестник РАМН. - 1999. - №6. - С. 43-47.
3. Апанова О.И., Шелехин А.А. Внебольничные пневмонии с присоединением внутрибольничной инфекции у лиц с хронической алкогольной интоксикацией// Новости науки и техники. Серия мед. Вып. Алкогольная болезнь/ВИНИТИ.2003. №6. С.1-3.
4. Анохина И.П. Центральные механизмы предрасположенности к зависимости от психоактивных веществ / И.П. Анохина, Н.Л. Векшина, А.Г. Вертинская // Журнал неврологии и психиатрии им. С.С. Корсакова. - 1997. - №12. - С.83-84.
5. Ахмадеева Э.Н. Алкогольный синдром плода / Э.Н. Ахмадеева, Е.К. Алехин, Н.Р. Хусамова //Здравоохранение Башкортостана. - 1996. - № 2-3.-С. 46-51. 1. Абдул Рахман С.А.Ш. Трехмерная морфология долек тимуса кролика в онтогенезе: Автореф. дис. канд. мед. наук. Волгоград. 1997. 19 с.
6. Абдрашидов А.Х. Потребление этанола крысами в условиях свободного выбора, а также при даче растворов этанола в качестве единственного источника жидкости // Биологические основы алкоголизма. М.: Медицина, 1984. С. 197-199.
7. Альтшулер В.Б. Алкоголизм. М., 2010. 264 с.
8. Балака Ю.Д., Карташова В.Е., Скосырева А.М. Воздействие алкогольной интоксикации беременных крыс на систему кроветворения их потомства //Акушерство и гинекология. 1982. № 9. С. 56-57.
9. Ганопольский В.П. Система опиоидов и гормонов стресса при тяжелой механической травме и интоксикации этанолом. Дисс.канд. мед. наук. СПб, 2003. 108 с.
10. Казарновская М.Л., Василос А.Ф., Дмитриенко В.Д. Мутагенное действие этилового спирта на культуру клеток человека //1-й Всесоюз. съезд судебных медиков. Тез. докл. Киев, 1976. С. 594-595.
11. Кампов-Полевой А.Б., Жуков В.Н. Изучение исходной потребности в алкоголе в популяции лабораторных крыс. // Деп. В ВИНИТИ. 1979. №82779.
12. Битти М. Алкоголик в семье или преодоление со зависимости: Пер. с англ. / М. Битти. - М., 1997. - 331 с.
13. Волошин В.М. Состояние и перспективы развития детской психиатрической службы в России / В.М. Волошин, Б.А. Казаковцев, Ю.С. Шевченко, А.А. Северный // Социальная и клиническая психиатрия. - 2002. -Т. 12. Вып. 2.-С.5-9.
14. Гармаш И.В.Рябова А.В.,Ежова Л.Г. и др.Тяжелая пневмония у больного с алкогольным циррозом печени , цитопенией и ДВС-синдромом (возможности современной терапии)//Новости науки и техники. Серия мед. Вып. Алкогольная болезнь/ВИНИТИ,2003. №6.С.1-3.
15. Гурьева В.А. Клиническая и судебная подростковая психиатрия / В.А. Гурьева, Т.Б. Дмитриева, Е.В. Макушкин, В.Я. Гиндикин и др. - М.: Медицинское информационное агентство, 2007. -488 с.
16. Емельянцева Т. А. Роль семьи с алкогольными проблемами в формировании девиантного поведения у подростков / Т.А. Емельянцева // Труды молодых ученых. - Минск, 2000. - с . 142-144.

17. Емельянцева Т.А. Результаты и перспектива психотерапевтической работы по первичной профилактике алкогольной и наркотической зависимости среди подростков / Т.А. Емельянцева. - Минск, 2001. - с.210-217.
18. Крупская Т. С. Состояние липидного обмена у новорожденных, родившихся от матерей, употребляющих алкоголь во время беременности: Автореф. дис.... канд. мед. наук / Т.С. Крупская. - Ставрополь, 1992. - 25 с.
19. Мирошниченко Л. Д. Наркологический энциклопедический словарь в 2 частях. - Часть 1. Алкоголизм / Л.Д. Мирошниченко, В.Е. Пелипас. - М.: Анахарсис, 2001. - 190 с.
20. Ilhomovna, F. N. (2022). RESPONSIBILITY OF PARENTS BEFORE THE OFFSPRING. Conferencea, 441-446.
21. Моисеев В.С. Маркеры алкогольной болезни / В.С. Моисеев // Новый мед. жур. - 1996. - №4. - С. 24-27.
22. Миракян Л.А. Морфологические исследования слизистой оболочки верхних дыхательных путей при хронической алкогольной интоксикации в эксперименте на животных//Журн. Ушных, носовых, горловых болезней 1988. №3.С 28-30.
23. Ilhomovna, F. N. (2022). LATE SEIZURES AND CONSEQUENCES OF EPILEPSY IN YOUNG CHILDREN. Conferencea, 219-223.
24. Найденова Н.Г.Гордеев М.Н. Алкоголизм и патология органов дыхания // Наркология. 2002.№4.С.23-26.
25. Наличко Н.Н.Аспирационная пневмония на фоне алкоголизма// Клинич. Медицина.1990 .№4.С.85-87.
26. Ховерс Л.Я., Овчинников Ю.М.,Дроздов Э.Д.,Кудряшова Н.Д.Состояние ЛОР-органов у больных хроническим алкоголизмом//Вестн.отолорингологии.1986.№3.С.71-73.
27. Arnold R. Patient attitudes concerning the inclusion of spirituality into addiction treatment / R. Arnold // J. Subst. Abuse Treat. Dec. V. 23. Ха 4. 2002. -P. 90 - 94.
28. Burke R. Workaholism and divorce among Australian psychologists / R. Burke, Z. Burgess, F. Oberklaid // Psychol. Rep. Aug. - V. 93. № 1, 2003. - P. 29 - 32.
29. Christodoulou G.N. The delusional misidentification syndromes: strange, fascinating, and instructive / GN. Christodoulou, M. Margariti, V.P. Kontaxakis // Curr. Psychiatry Rep. - 2009. - No. 11(3). - p. 185-189.
30. Kamolov, K. Y. (2022). MORPHOLOGICAL FEATURES OF THE LUNG IN ALCOHOLISM. EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE, 2(3), 12-15.
31. Kamolov, H. Y. (2022). MORPHOLOGICAL FEATURES OF THE LUNG AND BRONCHIAL TREE IN CHRONIC ALCOHOLISM.
32. Камалова, Ш. М., Тешаев, Ш. Ж., & Хамидова, Н. К. (2020). Параметры физического развития 8-летних детей в норме и при сколиозе. *Морфология*, 157(2-3), 92-93.
33. Камалова, Ш. М., Тешаев, Ш. Ж., & Хасанова, Д. А. (2021). Морфометрическая характеристика параметров физического развития детей со сколиозом. *Оперативная хирургия и клиническая анатомия (Пироговский научный журнал)*, 5(2), 26-31.
34. Kamalova, S. M., & Teshaeв, S. J. Comparative Characteristics of Morphometric Parameters of Children with Scoliosis. *measurements*, 14, 15.
35. Камалова, Ш. М., Тешаев, Ш. Ж., Changes in anthropometric parameters of physical development of children with scoliosis (2021). *Society and innovations*, 2 (2), 432-440
36. Kamalova, S. M. (2021, January). CHANGES IN THE PARAMETERS OF THE PHYSICAL DEVELOPMENT OF 9-YEAR OLD CHILDREN WITH SCOLIOSIS. In *Archive of Conferences* (pp. 5-6).
37. Muzaffarovna, K. S. (2021). Morphometric changes in the parameters of physical development of children with scoliosis. *ACADEMICIA: AN INTERNATIONAL MULTIDISCIPLINARY RESEARCH JOURNAL*, 11(2), 359-361.
38. Тешаев, Ш. Ж., Баймурадов, Р. Р., Тешаева, Д. Ш., Камалова, Ш. М., & Асадова, Н. Х. (2019). Морфологические изменения семенников крыс при хронической лучевой болезни и при воздействии биостимулятора. *Морфология*, 155(2), 277-277.
39. Камалова, Ш. М., Хасанова, Д. А., & Алимова, Н. П. (2020). НАРОДНАЯ МЕДИЦИНА КАК МЕТОД ЛЕЧЕНИЯ У ДЕТЕЙ СО СКОЛИОЗОМ. *Новый день в медицине*, (4), 525-528.
40. Камалова, Ш. М., Хасанова, Д. А., & Алимова, Н. П. (2020). НАРОДНАЯ МЕДИЦИНА КАК МЕТОД ЛЕЧЕНИЯ У ДЕТЕЙ СО СКОЛИОЗОМ. *Новый день в медицине*, (4), 525-528.
41. Kamalova, S. M., & Teshaeв, S. J. Comparative Characteristics of Morphometric Parameters of Children with Scoliosis. *measurements*, 14, 15.