

MORPHOLOGICAL FEATURES CHANGES IN THE BRAIN STRUCTURE DURING ALCOHOL INTOXICATION

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ABSTRACT:

Data of social and medical statistics of the last decade show a constant high level of prevalence of alcoholism and alcoholic psychosis among different groups of the population.

Keywords: shock, traumatic, poisoning, alcohol, brain

Enter: To date, mortality due to the consequences of alcohol abuse, in world and domestic statistics, is second only to injuries, cardiovascular and oncological diseases. Deepening knowledge in the field of etiology and pathogenesis of alcoholic disease, as well as the development of reliable morphological criteria for diagnosing acute and chronic alcohol poisoning are named as priority tasks of medicine.

The aim of the study was to study changes in various brain structures in acute and chronic alcohol poisoning on a model at different times. Material and research methods. The work was performed in an experiment on 45 outbred mature male rats weighing 190-200 grams. The study and modeling of acute and chronic alcohol poisoning were carried out according to the method of V.P. Necessary et al. (1999, 2001). To do this, 20 hours before the introduction of alcohol, the animals were deprived of food. A 30% ethanol solution was administered intragastrically using a metal probe at a dose of 12 g/kg per day.

Literature analysis and Methodology: The results of our studies showed that acute single alcohol poisoning caused plethora of the pia mater and predominantly reversible changes in neurons, the number of neurons in the cortex did not change. Most of the unchanged neurons were in the hippocampus (59.7%), significantly less in the thalamus 16% and the cerebral cortex 25%. No altered neurons were found in the hypothalamus and cerebellum. Dark-type cell changes leading to shrinkage of neurons, which were also considered irreversible, are currently not considered so categorically, since it has been proven that when conditions change and the damaging factor stops, they are able to recover, in any case, with alcohol intoxication, this has been proven. Of course, some of them, especially when unfavorable conditions persist, die, but since

at the light level we cannot differentiate between viable and dying neurons, we classified all cells altered according to the dark type as conditionally reversible. Hydropic changes in neurons are traditionally considered reversible, while the continued action of the pathogenic factor can also lead to the formation of "shadow cells". Thus, the division of neuronal changes into reversible and irreversible is rather arbitrary, but it is necessary in order to morphometrically assess the degree of impact of various damaging factors.

Results: Chronic alcohol intoxication was manifested by sclerosis of the walls of arterioles and significant focal neuronal devastation. At the same time, the number of neurons decreased compared to the norm by 35%. The causes of neuronal devastation in this case can be both vascular changes and the direct neurotoxic effect of alcohol associated with the non-oxidative metabolism of ethanol with the formation of fatty acid ethyl esters. The focality of this process may be due to both vascular lesions and neurotoxic effects on neuronal modules that are active at a given time. The most damaged structure was the cerebellum, where 36% of neurons had irreversible changes, among which neuronophagia predominated. Hydropic changes occurred only in 22% of the cells, and "dark" neurons - in 32%. The least affected formation was the hippocampus, where only "shadow cells" were present in 9% of irreversible changes, and the vast majority of neurons were with reversible hydropic changes in 81%. In other structures, irreversible changes occurred with approximately the same frequency.

Discussion: Thus, we can conclude that Acute alcohol poisoning is characterized by plethora of the pia mater and predominantly hydropic reversible changes in brain neurons. Chronic alcohol intoxication was manifested by significant focal neuronal devastation, sclerosis of the walls of arterioles. The number of neurons significantly decreased. The remaining neurons were altered, more than half irreversibly, with the most affected structures being the hypothalamus and cerebellum.

Summary

1. For the first time, a comprehensive clinical and morphological (including morphometric) assessment of the effect of traumatic shock on the brain against the background of acute alcohol poisoning was carried out in experimental animals.
2. Significant neuronal destruction in acute alcohol intoxication was demonstrated morphometrically.

3. Foci of brain tissue necrosis and neuron damage of various severity, especially in traumatic shock manifested in the reticular formation, were found to cause significant damage to the brain.

4. The combination of traumatic shock and alcohol intoxication led to an increase in quantitative and qualitative changes in brain neurons, including irreversible masks.

ABSTRACT:

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