

CASES OF CARBON MONOXIDE POISONING IN FORENSIC MEDICINE

Abdurakhmanov Yuldoshali Toshtemirovich

Khakimov Zainobiddin Kobiljonovich

Andijan State Medical Institute, Uzbekistan

Abstract: This review article shows the current problem of assessing the severity of chemical injury in carbon monoxide poisoning as a result of a fire against the background of ethyl alcohol poisoning. An analysis of the literature on forensic characteristics of carbon monoxide poisoning in a fire against the background of alcohol intoxication was carried out.

Keywords: high temperature, method, carboxyhemoglobin, ethyl alcohol.

INTRODUCTION: In the literature [4,5], when analyzing the cause of death of those killed as a result of a fire in confined spaces (private houses, apartments and other premises), attention is always drawn to the group of young and middle-aged people who died, in whom the concentration of carboxyhemoglobin in the blood exceeds 50%, there is ethanol in the blood and urine (kidney tissue) and there are no obvious serious diseases. In this regard, carbon monoxide poisoning against the background of alcohol intoxication is of particular relevance in the forensic medical examination of cases of death as a result of fire [2].

MATERIALS AND METHODS: Some researchers [3] have studied the features of the influence of high-temperature factors on the concentration of ethanol and carboxyhemoglobin in liquid biological media. Some authors [1], studying the features of the influence of high temperature on ethanol concentration, showed that there is a significant increase in the level of ethanol in all objects of study. This phenomenon is associated with thermal coagulation of integumentary tissues, water imbalance, fluid loss and blood thickening. In a number of cases, the results of studies have shown that with significant exposure to high-temperature factors, with the formation of a large area of thermal damage to tissue, there is a tendency to reduce the level of ethanol in the liquid media of the corpse. This phenomenon is due to significant damage to the integumentary tissues and the possibility of the release of ethanol, as a highly volatile substance, from liquid biological media.

Other authors [4], studying this problem, believe that in case of carbon monoxide poisoning in a fire, high temperature affects the content of carboxyhemoglobin in the blood. Expert and experimental material shows a direct dependence of the quantitative content of carboxyhemoglobin on the degree and area of body damage by flame. A decrease in the level of carboxyhemoglobin concentration was noted when tissues were exposed to high temperatures, in particular an open flame, up to its complete disappearance from the blood, which distorts the diagnosed degree of carbon monoxide intoxication before death. In addition, high temperature causes the breakdown of carboxyhemoglobin, and therefore the content of carboxyhemoglobin in the blood of burnt corpses may be low. The decrease in carboxyhemoglobin in the blood of corpses under the influence of high temperature is due to the splitting off of carbon monoxide associated with hemoglobin and its partial volatilization [5]

RESULTS AND DISCUSSION: The selective effect of carbon monoxide is primarily manifested in its interaction with blood hemoglobin, as a result of which severe hemic hypoxia is observed. The central nervous system is particularly vulnerable and sensitive to oxygen starvation [1]. The results of some studies [2] showed that the effect of ethyl alcohol was beneficial in neurovegetative and vegetosensory disorders of the central nervous system, which was expressed by an increase in concentration thresholds to the action of carbon monoxide. However, in severe cases of ethyl alcohol poisoning, the toxic effect was enhanced, which was manifested by a sharp decrease in the concentration thresholds of stem and pyramidal disorders. These studies have shown that the

resistance of parts of the nervous system to the action of carbon monoxide against the background of alcohol intoxication increases according to the following scheme: psychosensory disorders, inhibition of the reticular formation cortex, inhibition of brain stem formations. Consequently, the phylogenetically most ancient brainstem is less sensitive to hypoxia than the younger cerebral cortex [4].

The presence of alcohol intoxication had a significant impact on the incidence of such disorders of cardiovascular activity as the development of metabolic changes, cardiac ischemia and cardiac conduction disorders. The frequency of manifestations and severity of dysfunctions of the cardiovascular system were more pronounced in patients with alcohol intoxication. This is associated with more severe hypoxic damage to the myocardium when carbon monoxide intoxication is combined with inhalation injury due to ethanol poisoning [5]. Excessive alcohol consumption may be a major risk factor for high carboxyhemoglobin levels in the blood. This is due to the fact that ethyl alcohol reduces the ability of the deceased to avoid a fire and the inability to protect himself in the fire. Ethyl alcohol leads to deterioration of perception, euphoria, impaired coordination of movement, decreased sensory response and reduces the ability to correctly assess the impending danger to the body as a result of a fire.

CONCLUSION: Thus, the above studies have shown that exposure to high temperature factors affects the concentration of ethanol and carboxyhemoglobin in liquid biological media. In particular, thermal coagulation of integumentary tissues, water imbalance, fluid loss and blood thickening can lead to a significant increase in ethanol levels in all study objects.

At the same time, with significant thermal damage to tissues, ethanol, as a highly volatile substance, may escape from liquid biological media and reduce its concentration. Also, there is a decrease in the concentration of carboxyhemoglobin when tissue is exposed to high temperatures, in particular an open flame, which, among other things, contributes to the detachment of carbon monoxide associated with hemoglobin and its partial volatilization.

Taking into account the above, it is necessary to critically evaluate the detected concentration of ethanol and carboxyhemoglobin in biological objects, taking into account the peculiarities of the impact of high temperature factors and open flames on the corpse.

REFERENCES:

1. Drapezo R.G., Sergeev O.D. Collection of initial information when examining the scene of the incident and the corpse // Bulletin of Kemerovo State University - 2015. - No. 2. - P. 150-157.
2. Alekseev I.V., Zaitsev A.P. On the issue of establishing the cause of death of persons found in fires // Siberian Medical Journal (Irkutsk). – 2013. - No. 7. - P. 119.
3. Research Center for Security Management of Complex Systems. "Academy of the State Fire Service of the Ministry of Emergency Situations of Russia." Moscow 2012 <https://academygps.ru/>
4. Luzhnikov E. A., L. G. Kostomarova. Acute poisoning // M.: Medicine. – 2020. – P.434
5. Iskandarov A.I., Abdugarimov B.A. Toxicometry in acute carbon monoxide poisoning due to alcohol intoxication // Toxicological Bulletin. – 2019. - No. 4. - P. 12.