

FORENSIC MEDICAL ASPECTS OF FACTORS AFFECTING
CORBANATANGIDIRITE POISONING

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ANNOTATION

This article reflects the relevance of carbon monoxide poisoning and the impact of several related factors on it. The article discusses the peculiarities of the concentration of carboxyhemoglobin and ethyl alcohol in the blood under the influence of a high-temperature factor and open flames on the corpse. At the same time, the article discusses the problem related to the isolation, confirmation of the presence, and quantitative determination of not only carboxyhemoglobin, but also the need to identify other possible toxic substances formed in combustion products. The role of forensic medical examination in assisting investigative bodies in determining the cause of the deceased's death as a result of a fire was demonstrated.

Keywords: combined poisoning, ethyl alcohol, high-temperature factor.

Introduction: Human activity often leads to destructive impacts on the environment and the occurrence of emergencies. One of the common combustion products is considered to be carbon monoxide. Since carbon monoxide has no taste or smell, it cannot be detected in the air. In pure form, it is practically absent. Most often, this is a mixture of carbon monoxide and other gases with different content. Carbon monoxide occurs from incomplete combustion of carbon-containing compounds. These can be sources such as car exhaust fumes, house fires, and gases from heating system malfunctions. In addition, there are cases of carbon monoxide poisoning occurring in poorly ventilated residential premises with heated stoves.

Features of carbon monoxide poisoning under various circumstances. For the issuance of a forensic medical report, cases of carbon monoxide poisoning against the background of alcohol intoxication, in particular, if a significant amount of ethanol and a high concentration of carboxyhemoglobin are found in the blood of the deceased, along with thermal exposure to the deceased with high temperature and flames, present particular difficulties. Some authors note that the toxic effects of carbon monoxide and ethyl alcohol mutually intensify, meaning they can have a combined effect on the body. Ethyl alcohol leads to the accumulation of carboxyhemoglobin in the blood, which can subsequently lead to carbon monoxide poisoning. Furthermore, it can be noted that the minimal dose of ethanol in the blood can have a favorable effect on the outcome of carbon monoxide poisoning, while the maximum dose can increase the toxic effect of carbon monoxide, leading to an increased risk of death. A high concentration of carboxyhemoglobin in the blood of the deceased (more than 50%) during high alcohol intoxication has reliable criteria, namely a very short toxicogenic phase, which can be evidence of instantaneous death at the scene, and, conversely, a low concentration of carboxyhemoglobin in the blood and a mild degree of alcohol intoxication can indicate the death of the victim already outside the original focus of the lesion, or require the search for other causes of death. Thus, ethyl alcohol contributes to the accumulation of carboxyhemoglobin in the blood and thereby leads to the development of carbon monoxide poisoning that causes death. Other researchers, studying the peculiarities of the influence of high temperature on ethanol concentration, showed that a significant increase in

ethanol levels occurs in all research objects. This phenomenon is associated with thermal coagulation of covering tissues, water imbalance, fluid loss, and blood thickening. In some cases, the results of the conducted studies showed that with significant exposure to a high-temperature factor, with the formation of a large area of thermal tissue damage, there is a tendency towards a decrease in the level of ethanol in the liquid media of the corpse. This phenomenon is due to significant damage to the covering tissues and the possibility of the release of ethanol as a volatile substance from liquid biological media. In addition, the concentration of carboxyhemoglobin in the blood of the deceased as a result of carbon monoxide poisoning at the fire site can also be influenced by a high-temperature factor. When examining the expert materials, it can be determined that the carboxyhemoglobin content depends on the degree of burn and the area of the body's flame damage. High temperature can lead to the breakdown of carboxyhemoglobin and its further decrease in the cadaver's blood. This process is explained by the release of carbon monoxide associated with hemoglobin and its partial removal. Also, exposure to open flames can lead to the complete disappearance of carboxyhemoglobin in the cadaver's blood, making it difficult to diagnose the degree of carbon monoxide poisoning before death. A carboxyhemoglobin concentration greater than 50% in the blood is considered fatal. However, in practice, a lower concentration of carboxyhemoglobin in the blood is not uncommon. This result of low carboxyhemoglobin levels in the deceased's blood may raise doubts among investigators and Ministry of Emergency Situations representatives. In this regard, a crucial task for a forensic medical expert is not only determining the concentration of carboxyhemoglobin in the blood but also the presence and concentration of other combustion products (hydrogen cyanide, ammonia, hydrogen chloride, carbon monoxide, hydrogen fluoride, acetone, and other volatile substances). The indicated combustion products in combination with carbon monoxide can act as a single toxicant, causing combined poisoning, in which the concentration of carboxyhemoglobin is possibly lower than the lethal dose, which, under certain conditions, can lead to errors in determining the cause of death of the deceased.

Conclusion. Thus, based on the foregoing, it follows that the high-temperature factor affecting the corpse can affect the dosage of ethanol in liquid biological media; it is also noted that this factor also affects the carboxyhemoglobin content in the corpse blood, which can subsequently lead to a decrease in carboxyhemoglobin or its complete disappearance from the body; alcohol intoxication can be the main risk factor for the formation of a high concentration of carboxyhemoglobin in the blood;

in the blood of corpses found as a result of a fire, it is necessary to determine not only carboxyhemoglobin, but also other poisonous substances, especially if the concentration of carboxyhemoglobin is below lethal.

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