FEATURES OF CLINICAL AND PATHOHISTOLOGICAL MANIFESTATIONS OF TOXIC LUNG INJURY IN ACUTE SEWAGE GAS POISONING (CASE REPORT)

N. V. Kurdil[1], A. V. Basanets[1], K. F. Voroshilov[2], O. M. Rozhkova[2], V. S. Lisovska[1]

[1]L. I. Medved's Research Center of Preventive Toxicology, Food and Chemical Safety of the Ministry of Health of Ukraine (State enterprise), Kyiv, Ukraine
[2]Kyiv Regional Bureau of Forensic Medical Examination, Kyiv, Ukraine

Abstract. In Ukraine, cases of inhalation poisoning with sewage gases are observed every year among municipal workers and residents of private households, unfortunately, most of them are fatal.
The aim. Based on published data and our own research, to investigate the clinical and pathohistological features of lung damage in acute poisoning with sewage gases.
Materials and methods. The medical data of a male patient who died as a result of poisoning with sewage gases were analyzed. The preparations were examined using an Olympus CX 41 microscope in transmitted light, at a magnification of 100, 200 and 400 times.
Results. The clinical picture of inhalation poisoning with a mixture of toxic gases in a 46-year-old man was accompanied by pronounced neurotoxic and pulmonary toxic effects. Rapid loss of consciousness and development of purulent-necrotic changes in the lung tissue indicated high concentrations of toxic gases. According to the results of pathohistological studies, the following were found in the lung tissue: foci of hemosiderosis, acute alveolar emphysema and dysatelectasis. In the myocardium: moderately pronounced arteriosclerosis, arterial spasm, foci of stromal edema, abnormal arrangement of muscle fibers, fragmentation and hypoxic dystrophy, interstitial sclerosis with perifocal hypertrophy of cardiomyocytes, perivascular sclerosis and lipomatosis. In the brain tissue: edema-swelling with few perivascular hemorrhages. Uneven, sometimes increased, blood filling of the studied organs with signs of impaired rheological properties of the blood was noted.
Conclusions. The toxicity of sewage gases is due to the simultaneous action of chemicals and highly pathogenic flora contained in the gas mixture. Clinical signs of damage are rapid loss of consciousness and rapid development of purulent-necrotic changes in the lung tissue, namely: purulent-fibrous bronchopneumonia with intraalveolar hemorrhages, with foci of hemosiderosis, acute alveolar emphysema and dysatelectasis.

Key words: inhalation poisoning, pulmonary toxicants.

Декларація етики. Дослідження виконані відповідно до принципів Гельсінської декларації (ВМА, 1964 р.) та схвалені Комісією з етики медико-біологічних досліджень Наукового центру.

Конфлікт інтересів. Автори заявляють про відсутність конфлікту інтересів.

Джерела фінансування. Дослідження виконано у рамках науково-дослідної роботи Наукового центру превентивної токсикології, харчової та хімічної безпеки імені академіка Л. І. Медведя Міністерства охорони здоров'я України (Державне підприємство) на тему: «Наукове обґрунтування медичних критеріїв хімічної та харчової безпеки; токсиколого-гігієнічні дослідження хімічних речовин, пестицидів і агрохімікатів, полімерів, матеріалів і виробів; медико-санітарне регламентування небезпечних факторів у об'єктах середовища життєдіяльності людини» (державний реєстраційний номер: 0123U102087).

Ethics Declaration. The studies were performed in accordance with the principles of the Declaration of Helsinki (BMA, 1964) and approved by the Commission on Ethics of Biomedical Research of the Scientific Center.

Conflict of Interest. The authors declare no conflict of interest.

Funding Sources. The study was carried out within the framework of the scientific research work of the Scientific Center for Preventive Toxicology, Food and Chemical Safety named after Academician L. I. Medved of the Ministry of Health of Ukraine (State Enterprise) on the topic: "Scientific substantiation of medical criteria for chemical and food safety; toxicological and hygienic studies of chemicals, pesticides and agrochemicals, polymers, materials and products; medical and sanitary regulation of hazardous factors in objects of the human living environment" (state registration number: 0123U102087).