



Morphological Criteria of Drowning

1. Makhmudjonova Sitorabonu Rustamovna
2. Shavkat Eryigitovich Islamov

Received 2nd Jan 2023,
Accepted 3rd Feb 2023,
Online 6th Mar 2023

Abstract: The article notes the need for locally supervised care for preschool children and persons under the influence of alcohol can reduce the risk of drowning. The characteristic features of different types of drowning deaths are identified. It has been established that it is necessary to pay special attention both to a number of morphological changes in the internal organs and to the results of the laboratory examination (presence of a diatom plankton).

Key words: drowning, morphological criteria, diatom plankton.

¹ 4th year student Samarkand State Medical University

² Doctor of medical sciences, associate professor, Department of Pathological Anatomy and Sectional Biopsy, Samarkand State Medical University

Relevance. Currently, according to WHO, over 300,000 people die of drowning each year, making drowning one of the major public health problems in the world. This type of injury accounted for more than 9% of total global mortality, accompanied by various complications. Drowning is the third leading cause of death from unintentional injuries, accounting for 7% of all trauma-related deaths [3]. This problem, and drowning deaths in particular, are found in all countries and regions, but: low- and middle-income countries account for 90% of all deaths from unintentional drowning [2]; more than half of the world's drownings occur in the WHO Western Pacific and South-East Asia regions; the WHO African Region has the highest drowning death rates, which are 15-20 times higher than those in Germany or the United Kingdom of Great Britain and Northern Ireland. In the United States, 45% of drowning deaths occur among the most economically active segment of the population [6,9]. In the U.S. alone, the direct and indirect costs of drowning in coastal waters are measured at \$273 million per year. Estimates of global drowning mortality involve a great deal of uncertainty and error. Particular attention has been given to laboratory methods of investigation [1,5], especially the detection of diatom plankton in internal organs [4,7,8,10]. Scientific novelty consists in the determination of characteristic signs of different types of death from drowning in the Republic of Uzbekistan.

The aim of the study: Was to identify the characteristics of different types of drowning deaths in the Republic of Uzbekistan.

Material and methods of research. The study involved a retrospective analysis of 30 forensic medical examinations of the corpses carried out at the Samarkand regional branch of the Republican Scientific and Practical Centre of Forensic Medicine.

Results of the study : The findings show that the highest incidence of drowning is among children aged 1-4 years, followed by those aged 5-9 years. Males are also at highest risk of drowning, with the overall drowning mortality rate among males being twice that of females. Men are also more likely than women to be hospitalized for non-fatal cases of drowning. Research suggests that higher drowning rates among men are associated with increased exposure to water and higher risk behaviors such as swimming alone, drinking alcoholic beverages before swimming alone, etc.

In true (wet) drowning, during the stage of inspiration dyspnea, water actively enters the airways, irritating the mucosa of the trachea and large bronchi, causing coughing movements. The mucus produced mixes with water and air to form a frothy, greyish-white mass that fills the airway. This results in alveolar emphysema or so-called acute water emphysema - hyperhydrate - due to the high intrapulmonary pressure. Water is released into the interalveolar septum tissue by tearing the walls of the alveoli. Through the ruptured capillaries water enters the blood vessels. Blood diluted with water enters the left side of the heart and then the great circle of the circulation. The terminal stage is followed by a final respiratory arrest. The whole period of drowning lasts on average 5-6 minutes. The rate of asphyxia in drowning has been found to be greatly influenced by water temperature, hydrostatic pressure, emotional factors, etc. In cold water, death by drowning is hastened by rapid action on the reflex zones.

In the autopsy of persons who have died from true drowning, the lungs are found to be sharply enlarged. The anterior portions of the lungs cover the corpus callosum. Stripe-like imprints of the ribs may be seen on the surfaces of the lungs. The surface of the lungs often has a marbled appearance. The lungs do not always look the same. Hyper aery is when the lungs are sharply swollen but dry on cut, or when there is a small amount of liquid draining from the surface. Hyper aery is caused by air entering the tissue under the pressure of the fluid. The alveoli are ruptured and air enters the intercellular tissue. Hyper aery is a state of the lungs when a large quantity of aqueous fluid drains from the surfaces of the incisions, the lungs being heavier than usual but airy throughout. Subpleural Rasskazov-Lukomsky-Palstauf stains, which are fuzzy hemorrhages in the form of spots or stripes under the pleura of the lungs, are located subpleural. They have a pale pink color. The blood in the left side of the heart, diluted with water, is cherry red in color.

In the dry type of drowning water is swallowed, especially when this process is prolonged and the head appears above the surface. In such cases a large amount of liquid is found in the stomach, in which drowning has occurred. Water may also be in the initial part of the intestine. The sinus of the main bone of the skull is found to contain the fluid in which the drowning has occurred. If the eardrum is perforated, the water will irritate the middle ear receptors and death can be reflexive (a type of reflex called the auriculo-cardiopulmonary reflex). The cervical spine must be opened to rule out damage to the spine. Drowning also occurs after diving into the water upside down, when the cervical spine is damaged by hitting the surface of the water or the ground. Sometimes hemorrhages occur in the neck and chest muscles: along the sternocleidomastoid muscles, in the pectoral muscles. The detection of diatom plankton in the internal organs of a corpse is of great importance for the diagnosis of drowning. Diatoms are unicellular algae with a strong mineral shell. They are usually found in the internal organs as evidence of drowning. When diatoms were found only in the lungs, post-mortem exposure of the body to water was ruled out. Sections of the lungs, heart, spleen, kidneys, bone marrow, and fluid from the sinus of the main bone were taken for examination. A sample of water from the reservoir where the corpse was found was examined for diatom plankton. In the pathogenesis of asphyxia ("blue", "dry") type of drowning the leading link is an acute disorder of external respiration, in connection with what at research of a corpse spill, the saturated cadaver spots of a bluish-violet colour, blueness and puffiness of a face and a neck, hemorrhages in conjunctivitis, sharply expressed ballooning of easy with considerable increase in their volume and airiness are marked. The reflex type of drowning is

characterized by signs of rapid death, the most pronounced of which are spilled, saturated cadaveric stains of purplish-blue colour, liquid state of blood in heart cavities and large vessels in the absence of signs of other types of drowning.

Conclusions. Thus, providing locally supervised care for pre-school children and intoxicated persons can reduce the risk of drowning. Characteristic features of different types of drowning death are identified. Particular attention needs to be paid both to a number of characteristic morphological changes in internal organs, and to laboratory findings (presence of diatom plankton).

LITERATURE:

1. Anisimov L.P., Devyaterikov A.A. Modification of the method of making preparations for micro-logical examination// Selected issues of forensic medical examination. - Khabarovsk, 2017. - №16. - С. 7. //Анисимов Л.П., Девятериков А.А. Модификация метода изготовления препаратов для микробиологического исследования // Избранные вопросы судебно-медицинской экспертизы. — Хабаровск, 2017. — №16. — С. 7.
2. Gorbunov N. S. et al. Diagnosis of the circumstances of drowning // In the world of scientific discoveries. - 2014. - № 4.1 (52). - С. 458-471. // Горбунов Н. С. и др. Диагностика обстоятельств утопления // В мире научных открытий. – 2014. – № 4.1 (52). – С. 458-471.
3. Zhulzhik E. A. Diagnosis of drowning in modern forensic medicine // Concept. - 2015. - No. 04 (April). - С.1-6. // Жульжик Е. А. Диагностика утопления в современной судебной медицине // Концепт. – 2015. – № 04 (апрель). – С.1-6.
4. Kalashnikov D.P., Gornostaev D.V. New laboratory methods in the preparation and study of diatom plankton // Forensic medical examination, 2007. -№1. - С.39-42. // Калашников Д.П., Горностаев Д.В. Новые лабораторные методы в подготовке и исследовании диатомового планктона // Судебно-медицинская экспертиза, 2007. -№1. - С.39-42.
5. Osminkin V. A. To the question of microscopic diagnostics of death from drowning // Forensic Examination. - 2013. - Т. 56. - № 1. - С. 39-41. // Осьминкин В. А. К вопросу микроскопической диагностики смерти от утопления // Судебно-медицинская экспертиза. – 2013. – Т. 56. – № 1. – С. 39–41.
6. Ponomarev D.Y., Nikitaev A.V., Kurch A.M. On the possibility of revealing the fact of moving a corpse from the coastal sea strip with its subsequent burial // Forensic medical examination. - М., 2015. - №1. - С. 13-17. // Пономарев Д.Ю., Никитаев А.В., Курч А.М. О возможности выявления факта перемещения трупа из прибрежной морской полосы с последующим его погребением // Судебно-медицинская экспертиза. — М., 2015. — №1. — С. 13-17.
7. Potemkin A. M., Solokhin E. V., Gornostaev D. V. Forensic assessment of cases of drowning in a bathtub // Forensic medical examination. - 2013. - Т. 56. - № 1. - С. 31-34. // Потёмкин А. М., Солохин Е. В., Горностаев Д. В. Судебно-медицинская оценка случаев утопления в ванне // Судебно-медицинская экспертиза. – 2013. – Т. 56. – № 1. – С. 31–34.
8. Rybalkin R.V. Mozharov P.V. Study of diatom plankton in cases of drowning// Selected questions of forensic-medical expertise. - Khabarovsk, 2007 - N81. - С. 104-106.// Рыбалкин Р.В. Можаров П.В.Исследование диатомового планктона в случаях утопления// Избранные вопросы судебно-медицинской экспертизы. — Хабаровск, 2007 — №81. — С. 104-106.

9. Svetlakov A. V., Davydova Z. V. The term "drowning" in forensic medicine // Problems of expertise in medicine. - 2012. - T. 12. - № 3-4 (47-48). - С. 37-38. //Светлаков А. В., Давыдова З. В. Термин «утопление» в судебной медицине // Проблемы экспертизы в медицине. – 2012. – Т. 12. – № 3–4 (47–48). – С. 37–38.
10. Kamalova M., Islamov Sh.E. Morphological features of ischemic and hemorrhagic brain strokes//Journal of Critical Reviews. 2020. - Vol. 7, iss. 19. - P. 2630-2634.

