

MORPHOGENESIS OF ADRENAL CHANGES IN SUDDEN HEART DEATH**Siddikov Kutbidin Marifjonovich**

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Abstract: the morphofunctional and pathogenetic basis of sudden cardiac death (SCD) caused by pathological changes in the heart or coronary arteries was analyzed. SCD accounts for more than 50% of deaths from cardiovascular pathology worldwide. The results of the analysis of the literature showed that dysfunction of the hypothalamic-pituitary-adrenal system (HPAS) played an important role in the development of SCD, which affects the electrical conduction system of the heart and myocardial function. As a result of the extreme release of hormones in the adrenal glands, signs of morphological restructuring were revealed, such as delipidization in various layers of the cortex and an increase in the number of adrenaline-positive cells in the medulla. Along with myocardial ischemia, stress reactions of the endocrine system are also considered the main trigger factor in cases of SCD. Analysis of the available literature indicates that the correlation between the age-related morphofunctional state of the myocardium and adrenal glands in sudden cardiac death has not yet been sufficiently studied. Therefore, in-depth study of this issue using morphometric, histological, and histochemical methods makes it possible to improve the early diagnosis of SCD and develop new diagnostic criteria used in forensic medical practice.

Keywords: sudden cardiac death (SCD), myocardial ischemia, coronary arteries, adrenal glands, hypothalamic-pituitary system, adrenaline-positive cells, morphofunctional changes, forensic medical diagnostics.

Relevance of the topic. Sudden death (SD), caused by pathological changes in the heart or coronary arteries, is called sudden cardiac death (SCD) (Bokeriya L.A. et al., 2011; Pratt S.M. et al., 1996). HDL is the most common cause of HDL. Globally, it accounts for 50% or more of all cardiac deaths (Engdahl J. et al., 2002; Lopera G. et al., 2009).

Achievements in the further improvement of the sectional diagnosis of SCD are associated with the use of histological methods for the morphological identification of ventricular fibrillation from complications of SCD, which reflects the role of a different trigger than myocardial ischemia, the involvement of factors of a cardiac and extracardiac nature. Among extracardiac factors, dysfunction of the hypothalamic-pituitary-adrenal system (HPAS), which exercises supreme control over the function of internal organs, occupies a leading place (Shvalev V.N. et al., 1992).

In SCD, signs of structural restructuring are observed in the adrenal glands as a result of the emergency release of hormones, which is accompanied by delipidation of the reticular layer of the cortex and the appearance of a large number of adrenaline-positive cells in the medulla.

In some scientific works, morphological signs of structural changes in the cellular composition of the tissue in the form of a decrease in the number and activity of spongiocytes in the medulla and cortex of the adrenal glands in coronary heart disease have been identified; a large number of adrenaline-positive cells have been identified. The established specificity allows us to conclude that the formation of an attack of acute coronary insufficiency occurs under conditions of short-term increased release of corticotropic hormones, which leads to increased degranulation of corticotropic cells and their transformation into chromophobes (Ishikawa j. Yoshida S. Michiue T. et al., 2010), (Ishikawa 1., Zhu B.L.. Li D.R. et al., 2006).

The increase in the number of adrenaline-positive cells and the change in the proliferative activity index of basophil tropocytes compared to "control" indicators does not contradict the literature data (Dac M.W. et all - 1997) and can be used as additional forensic medical criteria for the diagnosis of SCD in young people.

Degree of study of the topic.

Sudden coronary death accounts for 1/2 of deaths from cardiovascular pathology. They are most often observed in men aged 35-45. In all diseases leading to such outcomes, the heart suffers and blood vessel problems begin. Myocardial ischemia is an important risk factor for sudden death. The degree of coronary artery damage is important. In approximately 90% of sudden deaths, atherosclerotic narrowing of the coronary arteries was observed in more than 50% of the vessel lumen. Hormonal neuroendocrine and hemodynamic factors influence the progression and course of atherosclerosis. The central nervous system, with the participation of endocrine glands, regulates metabolic processes.

In the literature known to us, based on morphometric data, we did not encounter studies studying the correlation between age-related morphofunctional states of the myocardium and adrenal glands in the development of sudden death.

Analysis of literature data shows that the features of early detection of individuals with a morphofunctional state of the cardiac conduction system, myocardium, and adrenal glands remain relevant and have not been fully studied. Data on the correlational changes and course of this pathology are currently absent, which is the main reason for the increased risk of developing SCD and, accordingly, requires further improvement of diagnostic tactics.

Studying the morphofunctional state of the adrenal glands in SCD, as well as resolving the question of possible additional risk factors influencing the pathogenesis and clinical course of these diseases, allows for early diagnosis.

Analysis of literature data shows that the features of the clinical course and early detection of sudden cardiac death in humans remain relevant and are not fully studied, data on macroscopic and histological, histochemical diagnostic criteria for the detection and assessment of the features of the course of this pathology are still absent, which is the main reason for the late diagnosis of sudden cardiac death and the increase in mortality and, accordingly, requires further improvement of forensic medical tactics.

Purpose of the work. Study of the features of the development and course of SCD and the morphofunctional state of the adrenal glands depending on age.

Research objectives:

1. Study of the dynamics of SCD.
2. Study of morphological and morphometric changes in the adrenal glands in SCD.
3. Comparative assessment of the dynamics of SCD and the morphofunctional state of the adrenal glands.
4. Creation of an algorithm for the continuity of the development and course of SCD and the morphofunctional state of the adrenal glands depending on age.

Materials and methods of research.

The object of the study was the myocardium and adrenal glands in age-related SCD.

Research methods:

- organometry - weighing mass, measuring dimensions.
- general morphological examination by staining with hematoxylin and eosin.
- Histochemical studies: mucopolysaccharidia with the SHIQ reaction. To determine the degree of lipid metabolism disorders - Sudanalysis, RNA and DNA according to Brache and Felgen, connective tissue according to the Van Gieson method.
- morphometry: histometry - the measurement and counting of cells in different sections of the myocardium and adrenal glands.
- statistical processing of the obtained digital data.

Practical significance of the work:

The practical significance of the research results lies in the fact that the main conclusions and recommendations presented in the work can be used to improve the examination tactics for the early and accurate diagnosis of corpses with SCD and adrenal pathology.

Conclusion: as a result of the conducted research, for the first time, an in-depth analysis of the morphological and biochemical changes in the adrenal glands in cases of sudden cardiac death (SCD) was conducted. It was established that in SCD, the content of lipid and phospholipid fractions of the adrenal glands increases significantly, while the content of polysaccharides and nucleoproteins decreases. These changes are accompanied by a decrease in the morphofunctional activity of spongiocytes, a decrease in their morphometric indicators. The results of the study for the first time scientifically characterized the structural basis of adrenal metabolic disorders in SCD and are important in determining the pathological mechanisms of these changes. The obtained data show a close relationship between morphological, morphometric, and biochemical changes in the adrenal glands in the development of SCD and provide a theoretical and practical basis for further research in this area.

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