

SUDDEN CARDIAC DEATH IN FORENSIC MEDICAL PRACTICE: THE ROLE OF HEART DISEASES

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Summary. Sudden cardiac death is a condition that turns into unconscious death and manifests itself within 1 hour with acute symptoms and is accompanied by cardiac pathology. The fact that diseases of the circulatory system are associated with dysfunction of the cardiovascular system in the aggregate is one of the pathologies proven by clinical and pathological studies. Recently, the pathology of coronary heart disease has attracted the attention of our medical staff with frequent cases of "sudden cardiac death" and has caused many controversial situations. For this, a histopathological examination of the tissue of the cardiac myocardium is carried out using materials obtained during the autopsy of the corpses of patients who died from various diseases. The aim of the study is to supplement data on cardiac pathologies.

Key words: autopsy, histology, myocardium, disease, examination.

Relevance. Nowadays, "sudden cardiac death" is one of the social problems of medicine, and it is one of the most difficult tasks for clinicians, pathologists, forensic experts. Many types of heart disease end in death of the patient, and in some cases, death occurs as a result of cardiac pathology at a time when no macroscopic signs are found in the heart, and its evidence leads to major discussion situations. Pathologies and complications of the underlying disease, knowing the heart disease that comes as an additional disease, pathologists and forensic experts can make a post-autopsy diagnosis of heart pathology as a primary, secondary, background disease, get practical advice on the correct completion of the death certificate.

Sudden cardiac death (SCD) is one of the most important unresolved cardiological problems worldwide. SCD takes the lives of many active, able-bodied people, about 20% of the dead do not have an obvious cardiac disease. Sudden cardiac death is death that occurs within minutes to 24 hours from the first onset of symptoms and occurs as a result of cardiac arrest against the background of sudden asystole or ventricular fibrillation in patients who were previously in a physiologically and psychologically stable state [1].

The main cause of SCD in adults is coronary heart disease (CHD) (80-85%), with more than 65% of cases associated with acute coronary circulation disorders, from 5 to 10% - with dilated cardiomyopathy and about 5-10% - with other heart diseases. Among young people, sudden death occurs in 20% of cases during sports, in 30%

during sleep, in 50% under various circumstances during wakefulness [2]. The main mechanisms of SCD in children and adolescents have not been fully disclosed, although some stages of tonatogenesis are quite clear. The immediate cause of death in older children and in children with organic pathology, regardless of age, in 80% of cases is ventricular fibrillation, most often provoked by ventricular tachycardia, less often by bradycardia and asystole, in younger age groups, asystole is initially recorded in 88% of cases [1- 3].

This review is an attempt to identify and analyze risk factors for sudden cardiac death in children and adolescents, as well as modern diagnostic methods.

Epidemiology

Sudden cardiac death accounts for about 5% of all deaths in children and adolescents (from 1.5 to 8.0 per 100 thousand per year). In the US, 5,000 to 7,000 apparently healthy children and adolescents die suddenly every year. In addition, SCD is registered in 1 out of 50-100 thousand athletes. According to pathoanatomical studies, SCD accounts for 2.3% of deaths under the age of 22 years and 0.6% in those aged 3 to 13 years. In Uzbekistan, the prevalence of SCD in children is from 1 to 13 per 100 thousand per year, and in adolescents involved in sports - 0.5 per 100 thousand. Every year, 10-12 schoolchildren die in physical education classes in Uzbekistan; 4-5 people per year die in physical culture and sports [1, 2].

Causes of sudden cardiac death

Unlike adults, in whom atherosclerotic changes in the coronary arteries are the dominant cause of SCD, the causes of sudden cardiac death in children are more diverse. Sudden death as an outcome of cardiovascular pathology occupies a special section of cardiology. Predisposing factors that contribute to the appearance of a life-threatening condition in children can be:

1. Congenital pathology of the cardiovascular system:
 - congenital heart defects (before and after surgical correction);
 - fibroelastosis of the endocardium;
 - dysplastic changes in the muscle-valve structures of the heart (valve prolapse, arrhythmogenic right ventricular dysplasia, vascular aneurysms).
2. Acquired pathology of the cardiovascular system:
 - myocarditis;
 - acquired heart disease;
 - hypertrophic cardiomyopathy.
3. Ischemic myocardial damage as a result of:
 - anomalies of the coronary artery;
 - spasm of the coronary artery;
 - thrombosis of the coronary artery;
 - vascular aneurysms.

4. Violation of excitability and conduction of the myocardium:

- Wolff-Parkinson-White syndrome (WPW-syndrome) with the development of life-threatening arrhythmias;
- Clerk-Levi-Cristesco syndrome (CLC syndrome);
- long QT syndrome;
- arrhythmias with the presence of ventricular extrasystoles;
- intraventricular blockade.

It can also be represented as:

1. SCD in children with known, previously recognized heart disease.
2. SCD in children who are considered healthy, when a life-threatening condition is the first symptom of the disease.
3. Syndrome of sudden infant death.

Goals and objectives.

The aim of the study is to identify the most common cardiac pathologies in the Bukhara region and, based on pathohistological findings, to develop which pathologies are more common, their consequences and preventive measures.) and macroscopic and microscopic analysis in the pathohistology department of the Bukhara Regional Bureau of Forensic Medicine. A total of 46 dead patients underwent heart tissue examination.

Materials and methods.

Based on macroscopic and microscopic studies of cardiac tissue during the study, a total of 46 cardiac tissue pathohistologically examined. For general morphology, 2 pieces from each heart, ie 1.5x1.5 cm from the upper and middle part, were cut and solidified in 10% neutralized formalin. After washing for 2-4 hours in running water, it was dehydrated in increased concentrations of alcohols and xylene, then paraffin was poured and the blocks were prepared. Incisions of 5–8 µm were made from paraffin blocks and stained with hematoxylin and eosin. The examination revealed the following pathologies:

Acute heart failure characteristic of alcoholic cardiopathy was observed in 19 cases, cardiomyopathy in 11 cases, and coronary atherosclerosis in 16 cases.

Results and conclusions.

The results of pathohistological examinations of the heart showed that in most cases, the pathology of acute heart failure (19 cases) characteristic of alcoholic cardiopathy was observed in the heart.

Acute heart failure characteristic of alcoholic cardiopathy (19 cases) - in some cases, ethanol may not be detected in the blood of a dead patient, but based on this result, it is also incorrect to say that the patient does not have alcoholic cardiopathy. In such cases, the catamnesis of the deceased patient plays an important role.

In second place was the pathology of coronary atherosclerosis (16 cases). Coronary atherosclerosis (16 cases) is a chronic disease of the arteries of the elastic

and musculoskeletal type, the accumulation of cholesterol and lipoproteins in the vascular wall as a result of disruption of the metabolism of fats and proteins in the body. In third place was the pathology of cardiomyopathy (11 cases).

Cardiomyopathy (11 cases) is a primary myocardial lesion of unknown etiology that is a disorder of heart function unrelated to the coronary arteries, valve apparatus, pericardium, systemic disease, or pulmonary hypertension.

When making a post-autopsy diagnosis, pathologists and forensic experts have the opportunity to cite renal pathology as the main, additional, background disease, to receive practical advice on the correct completion of the death certificate.

The underlying disease is a nosological unit that causes death by itself or through complications.

Background disease is a disease that is important in the emergence and development of the underlying disease, although it does not depend on the etiology of the underlying disease.

Concomitant (additional) disease is a nosological unit that is not etiologically and pathogenetically related to the underlying disease and its complications, does not affect its course and does not lead to death.

- These data open up the real prospect of a significant reduction in renal pathology and its resulting mortality, and provide undoubtedly useful information not only for pathologists, but also for all specialists involved in the diagnosis, prevention and treatment of kidney disease.

- This information can help to improve the performance of medical institutions at any level.

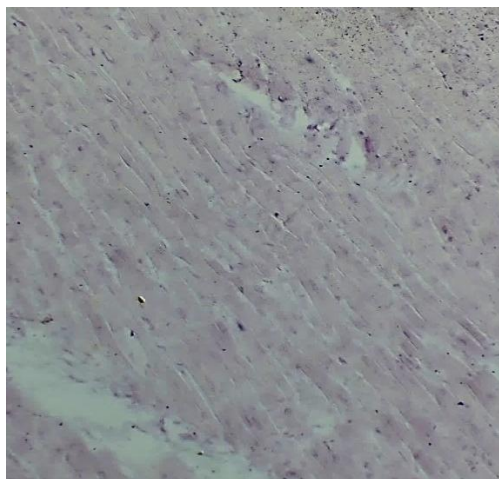


Figure 1. Loss of nuclei in some cardiomyocytes, weak neutrophil infiltration, onset of cardiomyocyte fragmentation.

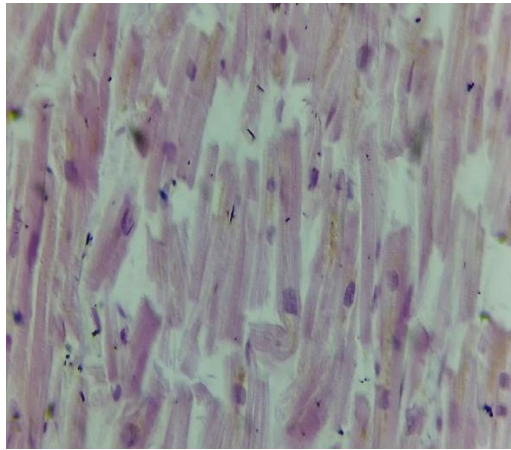


Figure 2. Fragmentation of a series of cardiomyocytes. Lipid drops.

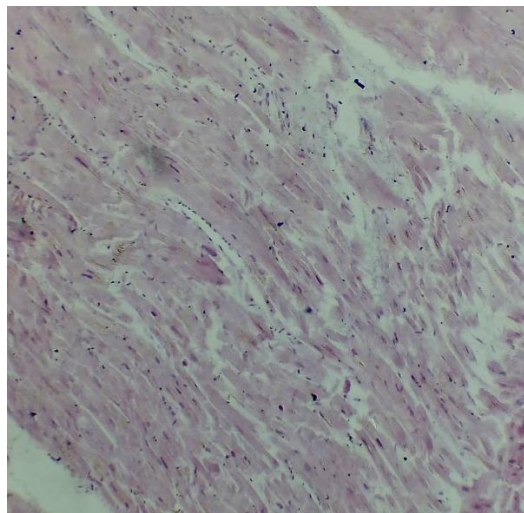


Figure 3. Weak neutrophil infiltration between cardiomyocytes, signs of fragmentation along some cardiomyocytes.

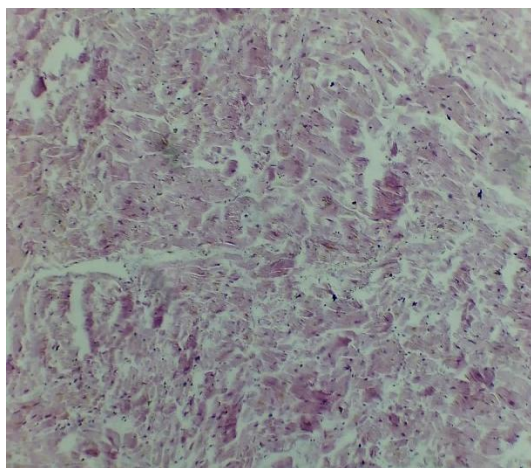


Figure 4. Swelling in the interval of cardiomyocytes, the presence of fragmentation, with weak neutrophil infiltration.

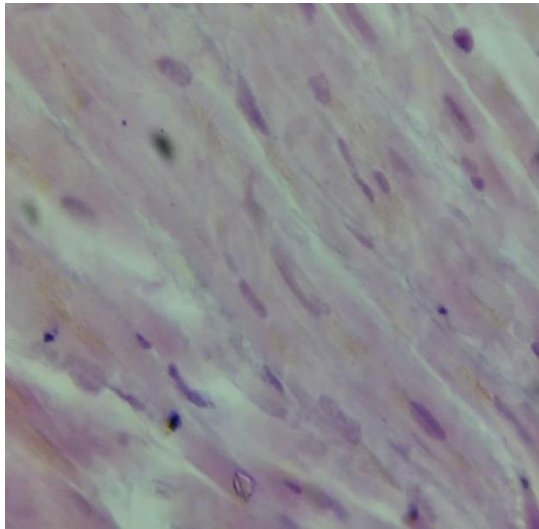


Figure 5. Symptoms of lipofuscinosis in cardiomyocytes, hypertrophy of cardiomyocytes.

References:

1. Sanoev B. A., Israilov R. I. And Djuraeva G. B. Quantitative Indicators And Methods For Modeling [Structural Units In Placental Insufficiency](#). World Journal Of Pharmaceutical Research. 9 (12), 37-47
2. Sanoev B.A. Morphological And Morphometric Characteristics Of The Placenta In Normal Pregnancy. Scientific Community: Interdisciplinary Research, 492-498
3. Саноев Бахтиёр Абдурасулович. Морфологические И Морфометрические Характеристики Плаценты При Нормальной Беременности. «Development Of A Modern Education System And Creative Ideas For It, Republican Scientific-Practical Online Conference On "Suggestions And Solutions»6,94-96
4. Б.А. Саноев, Г.Ш. Ниёзова, Н.И. Хикматова. Макро – И Микроскопические Проявления Лейомиом Матки. Новый День В Медицине, 526-528
5. Sanoyev Bakhtiyor Abdurasulovich, Olimova Aziza Zokirovna. Pathology Of Precancerous Conditions Of The Ovaries In Women Of Reproductive Age. Volume: 01 Issue: 06 | 2021.
6. Тураев, У. Р., Тураева, Г. Р., &Олимова, А. З. (2015). Особенности Микрогемоциркуляции Крови В Почках При Экспериментальной Острой Кишечной Непроходимости. *Наука Молодых–EruditioJuvenium*, (3).
7. Ахорова Ш. Б., Рахматова С. Н., Уринов М. Б. Опыт лечения больных с невропатиями лицевого нерва с применением препарата Nucleo CMF forte //Вестник Совета молодых учёных и специалистов Челябинской области. – 2016.

– Т. 1. – №. 1 (12). – С. 20-23.

8. Akhrova S. B., Nurullaev N. N. Features of vegetative dysfunction in postcovid syndrome //Vestnik Soveta molodyh uchyonyh i specialistov Chelyabinskoy oblasti (Bulletin of the council of young scientist and specialist of the Chelyabinsk region). – 2021. – Т. 1. – №. 32. – С. 10-13.

9. Akhrova S. B. Specific changes in the nervous system in patients with post-COVID syndrome //Bulletin of Kazakh National Medical University,(4). – 2021. – Т. 354. – С. 358.

10. Ахророва Ш. Б. Prevalence and neurological features of diabetic polyneuropathy in type 1 diabetes //журнал неврологии и нейрохирургических исследований. – 2021. – Т. 2. – №. 2.

11. Ахророва Ш. Б. Диабетической полинейропатии при сахарном диабете i типа //журнал неврологии и нейрохирургических исследований.–2021.–№. Special. – Т. 1.

12. Ахророва Ш. Б., Раупова Н. Ш. Клинические особенности эпилептических состояний у больных с хронической ишемией мозга //Вестник Казахского Национального медицинского университета. – 2021. – №. 4. – С. 308-310.

13. Ахророва Ш., Рахматова Д., Пулатов С. Сроки восстановления лицевого нерва при параличе Белла в зависимости от стороны поражения и пола //Журнал проблемы биологии и медицины. – 2012. – №. 2 (69). – С. 11-13.