ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

CHANGE OF HUMAN TOOTH AND MYOCARDIAL MORPHOMETRIC INDICATORS IN SUDDEN CARDIAC DEATH

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Abstract: Macroscopic changes of the heart in autopsy and forensic medical histology materials, morphometric parameters in microscopic general-morphological and histochemical staining methods were studied from 20-60 and over 40 subjects with sudden cardiac death in research and control groups. Morphometric studies of macroscopic, microscopic typical and atypical cardiomyositis in cardiac geometry, age-related changes of neurodystrophic disorders in the nervous system were revealed.

Keywords: Artificial intelligence; Cephalometrics; machine learning.

Introduction:

Every year, 17 million people worldwide die of cardiovascular diseases. close people die, 25% of them are UTO. The incidence of UTO per year is 1.4 per 100,000 population in women and 6.7 in men, and it is 0.5-3.7 per 1000 people among young people [2, 4, 5, 7, 8, 9].

13-15% of all deaths are sudden , and 90 % of them are caused by sudden cardiac death (1). According to various national registries, about 9 million people on earth die of sudden death every year.

VT is the dominant mechanism, and ventricular fibrillation is considered, various electrophysiological mechanisms are involved in the development and maintenance of tachycardia and fibrillation, including high automaticity and the mechanism of excitation wave feedback, which acute myocardium It occurs due to ischemia or fibrosis - necrotic changes, as a result of heterogeneity in its structure [3, 6].

Methods:

Morphological and morphometric changes of the heart were studied in autopsy and forensic medical histology materials from 20-60 and above 40 subjects with sudden cardiac death (SCD) in the research and control groups. The dimensions of the heart, its weight, wavy deformity and dissociation of cardiomyositis, contracture changes, and dystrophic changes in its nerves were studied.

Results:

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
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Scanned in a NanoZoomer (REFC13140-21.S/N000198/HAMAMATSU PHOTONICS/431-3196 JAPAN) used for 3D multiplex morphometric examinations and used to obtain confocal 3D images. in the form, the area of cross-sectional dimensions on the X, Y, Z axes according to the relief of points was studied. The obtained micrographs were processed in the QuPath-0.5.0-ImageJ software, and the diameter , fiber thickness, size, occupied area of atypical cardiomyocytes (Purkine fibers) located in the subendocardial area, the maximum, minimum and average thickness of typical cardiomyocytes, the thickness of the interstitial tissue area occupied by muscle bundles was measured in μm .

The samples of the micropreparations mentioned above were photographed after scanning, the sizes of each are presented in a special table, the average statistical analysis results are presented according to the Student-t test, and the average statistical indicators of the results obtained according to the reliability level $P \leq 0.05$ received.

Discussion:

Structural changes associated with myocardial injury are characteristic for TYuO , which led to changes in heart geometry - size, cavity shape, muscle mass and configuration .

In the control group, the macroscopic morphometric examination of the heart revealed the following average parameters: heart volume - 280±3.0g, length 9.5±0.2cm, width 9±0.3cm, thickness 4.8±0.4, left the thickness of the wall of the ventricle - 1.3±0.1cm, the thickness of the wall of the right ventricle - 0.4±0.1cm.

In the control group, wavy deformity of cardiomyositis was equal to 57.5 ± 2.8%, and dysstasia of cardiomyositis was equal to 64.4 ± 3.7%. The amount of contractures in the left ventricle was 64.2 ±5.8%. In the control group, contracture injuries of cardiomyositis of the 3rd degree were observed in both ventricles.

When the contractile coefficient of left ventricular cardiomyositis was studied in relation to age, it was observed that the indicators in the control group were significantly higher than the indicators in the research group [5].

In sudden cardiac death in the heart macroscopically - signs of ischemia in the myocardium, small sclerosis foci, hypercontractile state of cardiomyositis, wavy folds, fuchsinophilia, fragmentastia were observed.

Decreased contractile function of the left ventricular myocardium due to sclerotic changes and conduction disorders was considered the main risk factor of TYuO'.

Heart morphometric parameters in the research group: heart weight - 330±3.3g ($P<0.001$) , length 10.1±0.2cm ($P<0.001$) , width 9.4±0.3cm ($P<0.01$) , thickness 5.2±0.4cm ($P<0.05$) , left ventricular wall thickness - 1.6±0.1cm ($P<0.001$) , right ventricular wall thickness - 0.6±0.1cm ($P <0.001$) . When these indicators were compared, it was higher in sudden cardiac death compared to the control group. When both ventricles were histologically

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

examined, the predominance of 2-3 degree contracture damage of cardiomyositis was observed.

The location of contractures was most often found in the anterior, lateral and posterior walls of the left ventricle, mainly in the subendocardial and intramural sections of the myocardium.

In case of sudden cardiac death, wavy deformation in all areas of the myocardium, as well as symptoms of cardiomyositis dysstasia in the area of the placed discs occupying the full field of vision or 2/3 were expressed. The number of cardiomyositis with signs of undulating deformation is 44.2 ± 5.6% ($P<0.001$) , the number of cardiomyositis with signs of dysstasia is 58.7 ± 2.8% ($P<0.001$) did.

At autopsies, uneven filling was observed in 1/3 cases as a sign of macroscopic ischemia in the myocardium [7]. Macroscopically, small sclerotic foci were manifested with atrophy of cardiomyositis

Parallel changes were observed in the myocardium, coronary vessels, and reflexogenic sinocarotid areas. It was noted that the above-mentioned changes "rejuvenate" them when compared with the information in the literature.

In sudden cardiac deaths large focal cardiosclerosis was often observed in the interventricular septum, which testified to the involvement of the conductive system in the pathological process.

In the histochemical examination, massive discompletion of subendocardial and intramural myocardial bundles, massive stylolysis of Purkin fibers, severe swelling of cardiomyostites, and stylolysis of some were observed.

During scanning and morphometric examination, the diameter ratio of the components of the cross-section of the myocardium and the occupied area was measured, typical and atypical cardiomyositis, changes in the perimeter and relief of muscle cells located in tufts were studied.

When the morphometric parameters of the myocardium composition of the left ventricle front surface, side surface and back surface longitudinal section surface of typical and atypical cardiomyositis were studied compared to the control group, their statistical increase was noted.

Reactive and degenerative changes in myelin fibers and receptors in the reflexogenic sinocarotid areas of the heart were observed in the autopsies of people who died suddenly with increasing age, and it was noted that it ended with cardiac fibrillation. In these degenerative changes, the development of heart failure was observed in 8% of people under the age of 40, 24% under the age of 50, 30% under the age of 60, and 38% of people over the age of 60. Changes in cardiac tissue sympathetic nervous system concentration and denervation were seen as the cause of fibrillation.

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

Conclusion:

Macroscopic and morphometric studies of typical and atypical cardiomyositis in the geometry of the heart in morphometric examinations, age-related parallel changes of neurodystrophic disorders in the nervous system - ventricular fibrillation and asystole, impact on electrical instability, development of visceral pathology - sudden cardiac arrest death plays an important role in thanatogenesis

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ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
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