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АКТУАЛЬНІ ПИТАННЯ ТЕРЕТИЧНОЇ ТА ПРАКТИЧНОЇ МЕДИЦИНИ

Topical Issues of Clinical and Theoretical Medicine

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щитовидной железы. Гипертиреоз у крыс моделировали путем подкожного введения трийодтиронина в дозе 10 мг/кг или L-тироксина в дозе 50 мкг/кг в течение 7 дней. Материал для исследования – плазма крови и гомогенат сердца крыс. Активность катепсина Д оценивали по гидролизу гемоглобина в присутствии пепстатина. Содержание белка определяли по Лоури. Уровень T_3 и T_4 оценивали иммуноферментным методом.

Результаты. Повреждение миокарда у крыс сопровождается нарушением инкреторной функции щитовидной железы, о чем свидетельствует снижение уровней T_3 и T_4 на 55,6 % и 32% соответственно. В кардиомиоцитах обнаружено повышение внелизосомальной активности катепсина Д и уменьшение связанной с лизосомами активностью. Систематическое введение T_3 и T_4 снижает неседиментируемую и повышает седиментированнную активность катепсина Д, тиреоэктомия повышает оба вида активности, что может быть обусловлено регулирующим влиянием йодтиронинов как на состояние мембранных структур, так и на биосинтез фермента. Лизосомодестабилизирующий эффект более выражен у гипотиреоидных животных, по сравнению с эутиреоидными. На фоне гипертиреоза лизосомальная система миокарда оказывается более резистентной к повреждающему действию, более активным является T_3.

Вывод. Следовательно, йодтиронины в физиологических концентрациях можно рассматривать в качестве средств предупреждающих или ограничивающих развитие клеточного повреждения.

METHOD FOR DETERMINING THE HOMOGENITY OF AORTIC WALL CALCIFICATIONS

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Introduction. Cardiovascular diseases in Ukraine in 2012 amounted to 65.8% of deaths. The part of their prevalence and incidence in the structure of diseases among the general population is 31.5% and 7.4%, but it reaches 52.1% and 20% among people of retirement age. Cardiovascular diseases include myocardial infarction, stroke, and aneurysm of vessels. Calcified plaques on artery walls are one of the most common causes of heart attack and stroke due to a significant narrowing of the space between them. Plaques prevent normal blood supply of the myocardium and brain thereby not satisfying their need for oxygen. Calcification of vessels may cause their aneurism. In particular, the presence of abdominal aortic aneurism during a year can be a cause of a sudden death: a person dies from an internal bleeding in the abdomen caused by the rupture of aneurism. That's particularly why the study of the research methods of calcifications, its composition and the process of depositing in the wall of blood vessels are topical.

The objective of the research is to find out the features of location of the calcified deposits in the walls of the aorta and the extent of its heterogeneity.

Materials and the research methods. The study of the extent of homogeneity of the calcification of vessels' membrane was held with the use of gravimetric weighing of the samples dried under the following temperatures: 18°C, 40°C, and 100°C. Each sample was divided into four parts. Each part of calcified aorta was weighed after drying at thermostat. The selected temperature range allows to determine the mass fraction of free water with different bind force. To determine the extent of homogeneity the following formula was used: $H = \sum_{i=1}^{n}(|x - \bar{x}|)$; where H stands for the extent of heterogeneity, x stands for the percent of water loss in the sample, $\bar{x}$ stands for the arithmetical mean of the percent of water loss in all samples.

Results and discussion. The research showed that the average water content is 67%. The extents of heterogeneity 14, 2 and 7 show that calcified aorta loses water irregularly. Accordingly, the first part of the sample was more calcified than the others. This is confirmed by the amount of evaporation of water data: in the first sample it constitutes the smallest part – 52%, when in the other two samples it constitutes 69% and 75% resp. In addition, the first sample had less water evaporated

at room temperature, which refers to the liquid sector of interstitial fluid. The data about the water fractions part show that the pathological bioapatite is unequally distributed in the walls of a vessel.
Conclusions. The following method of studying the homogeneity of pathological biomineral can help to determine the mechanism of depositing of calcificates in the walls of vessels, and that will be a step forward to finding an effective method of diagnosis and treatment of vascular calcifications.

BIOGRAPHICAL SKETCH AND SCIENTIFIC WORK

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Camillo Golgi was born in July 1843 in Corteno, a village in the mountains near Brescia in northern Italy, where his father was working as a district medical officer. He studied medicine at the University of Pavia, where he attended as an 'intern student' the Institute of Psychiatry directed by Cesare Lombroso (1835-1909). Golgi also worked in the laboratory of experimental pathology directed by Giulio Bizzozero (1846-1901), a brilliant young professor of histology and pathology (among his several contributions, Bizzozero discovered the hemopoietic properties of bone marrow). Bizzozero introduced Golgi to experimental research and histological techniques, and established with him a lifelong friendship.

Golgi started his scientific career in 1869, with an article in which, influenced by Lombroso's theories, he stated that mental diseases could be due to organic lesions of the neural centers. In 1872, due to financial problems, Golgi had to interrupt his academic commitment, and accepted the post of Chief Medical Officer at the Hospital and continued his search for a new staining technique for the nervous tissue. In 1873 he published a short note ('On the structure of the brain grey matter') in the *Gazzetta Medica Italiana*, in which he described that he could observe the elements of the nervous tissue "studying metallic impregnations... after a long series of attempts". This was the discovery of the "black reaction" (*reazione nera*), based on nervous tissue hardening in potassium bichromate and impregnation with silver nitrate. Such revolutionary staining, which is still in use nowadays and is named after him (Golgi staining or Golgi impregnation) impregnates a limited number of neurons at random (for reasons that are still mysterious), and permitted for the first time a clear visualization of a nerve cell body with all its processes in its entirety.

In 1875 Golgi published, in an article on the olfactory bulbs, the first drawings of neural structures as visualized by the technique he had invented. In 1885, Golgi published a monograph on the fine anatomy of the central nervous organs, with beautiful illustrations of the nerve centers he had studied with his method.

In the same year, Golgi returned to Pavia, where he was appointed in 1876 as Professor of Histology. In 1881 Golgi was appointed to the chair of General Pathology at the University of Pavia, and he also maintained his teaching in histology.

In Golgi's laboratory, Emilio Veratti (1872-1967), described for the first time the sarcoplasmic reticulum in skeletal muscle fibers. In 1906 Golgi shared the Nobel Prize with Santiago Ramón y Cajal (1852-1934) for their studies on the structure of the nervous system.

He took an active part in public life; he was especially concerned with public health, and became a senator in 1900. He retired in 1918 but remained as professor *emeritus* at the University of Pavia. Golgi died in Pavia in January 1926. His publications are collected in the*Opera Omnia* (published by Hoepli Editore, Milan). The first three volumes of*Opera Omnia* appeared in 1903 and the fourth volume was edited by Golgi's co-workers (L. Sala, E. Veratti, G. Sala) and appeared in 1929.

Scientific Debates and the Impact of Golgi's Discoveries

Golgi's discovery of the black reaction and his subsequent investigations provided a substantial contribution to the advancement of the knowledge on the structural organization of the nervous tissue. The theory that tissues are composed of individual cellular elements (the cell theory) had been enunciated in 1838-1839 by Matthias Jacob Schleiden (1804-1881) and Theodor Schwann