

AGE-RELATED CHANGES OF NORMAL HEART ANATOMY

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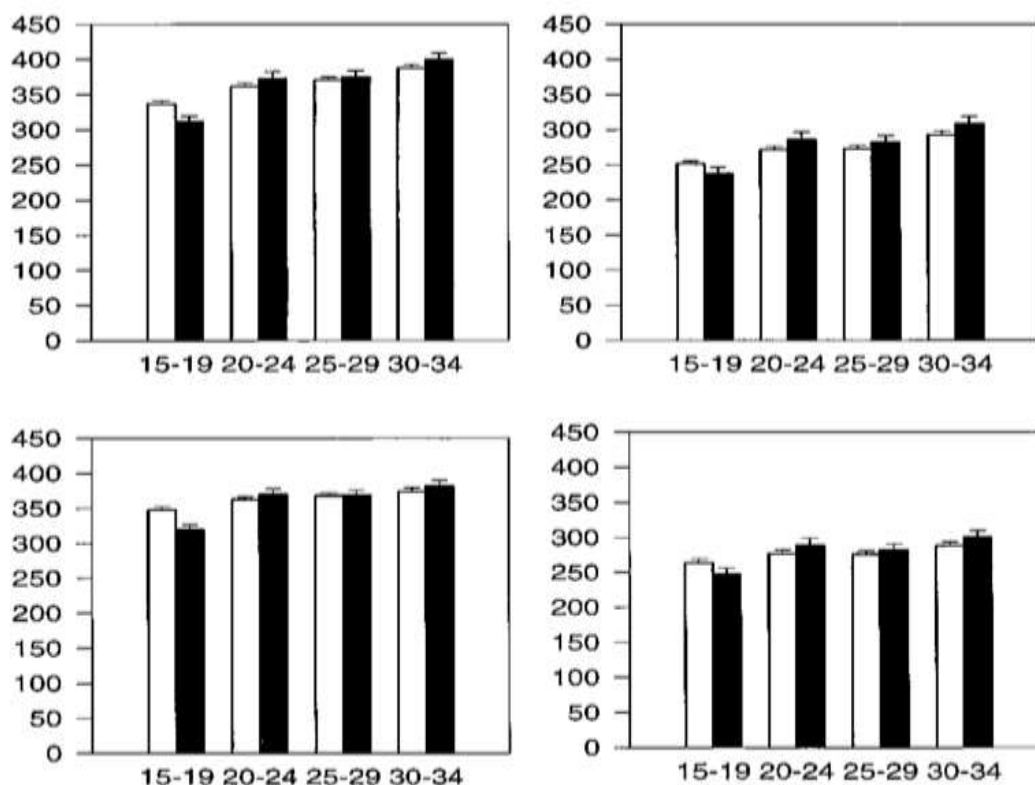
Abstract: *This article talks about morphological changes in the morphological structures of a healthy heart that change with age: heart weight, heart muscle degeneration, chambers, valves, pericardium, conduction system, and endocrine activity.*

Key words: *myocardium, degeneration, deposition, collateral, phenomenon, lipofuscin, collagen, conduction system.*

INTRUDATION

The heart is the main organ that provides blood flow in the human body. The heart is the first functioning organ in the embryo. Age-related adaptive changes of the heart are being filled with new information from year to year. The fact that death rates from heart diseases are increasing every year shows how relevant this topic is today. The formation of age-related norms is important for the diagnostic parameters of cardiovascular diseases affected by aging.

Cargo weight



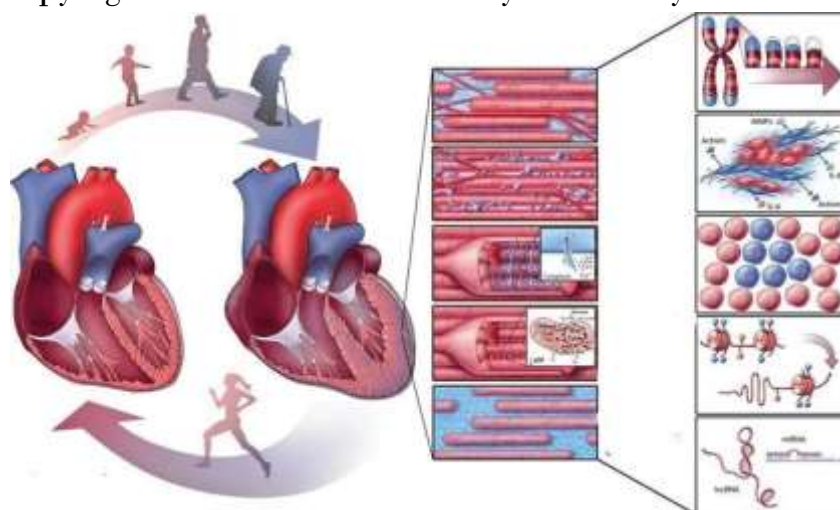
Men Women

Picture-1. Statistics on frequency of change of heart weight and age in men and women (Heart-weight-by-age-race-sex-and-hypertension-Heart-weights-were-lower-in-15-to_fig4_13613048) .

Many research findings confirm that the weight of the heart increases with age. The average heart weight is usually heavier in men than in women regardless of age. Unlike men, the weight of the heart increases significantly with age in women. This change, which occurs especially in 40-50-year-old women, is based on the increase in blood pressure that occurs as a result of menopause.

Muscle degeneration

As a result of aging, the shape of cardiomyocytes in the myocardium increases, and their number decreases. Age-related deposition of lipofuscin gives the myocardium a brown appearance. Despite the fact that this substance is a phenomenon of biological aging, it has been proven that it causes subclinical heart dysfunction in the elderly due to occupying a certain volume in the myocardial layer of the heart.



Picture-2. Molecular processes occurring in heart muscle with age.

Cameras

The age-related shortening of the distance from the base of the heart to the three parts also changes the shape of the heart. It causes a decrease in the systolic and diastolic volumes of the left ventricle, a deviation to the right due to the expansion of the aortic root, and an expansion of the left ventricle.

Valves

Age-related changes in normal heart valves are functionally significant. Mainly, the closing surfaces of the mitral and aortic valve leaflets become thicker from year to year. Collagen deposition and degeneration, lipid accumulation and dystrophic calcification affect their histological structure.

Pericardium

The pericardial lining is composed of collagen fibers that allow it to stretch when pericardial pressure or volume increases. Age-related flattening of collagen fibers leads to thickening, hardening and rigidity of the pericardium.

Coronary arteries

Coronary arteries twist and expand due to hemodynamic pull with age, independent of the weight of the heart. The most important thing is that with age, the heart is better supplied with coronary collateral blood vessels. That's why today the death rate is increasing in people who had a myocardial infarction at an early age because the collateral blood vessels are not well developed.

Monkenberg's medial calcification of the coronary arteries is an age-related degenerative process. Age-related high blood pressure is one of the main factors leading to this condition.

Transmission system

As a result of aging in the transmission system, it is characterized by tissue fibrosis, lipid infiltration, and a decrease in pacemaker cells and their special transmission proteins. At the same time, there is a decrease in the left bundle and intranodal muscle fibers arising from the bundles of His. Such changes in the conduction system of the heart lead to a decrease in the maximum heart rate and a decrease in the activity of catecholamines in old age.

Endocrine structure of the heart

In some cases, atrial natriuretic factor is secreted from heart chambers and ventricles. This factor is also called volume regulating hormone. This hormone is important in the accumulation of amyloid in the heart during aging.

Conclusion:

There are structural changes in the heart that accompany normal aging. For example, lipofuscin deposition is an epiphenomenon of old age, although it has no functional significance. The age-related changes in the heart discussed below are insufficient to reflect clinical disease. Research conducted with emerging technologies among selected populations may shed light on the relationship between cardiovascular disease and normal aging.

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