Volume 2, Issue 10, October 2024 ISSN (E): 2938-3765

STRUCTURE AND FUNCTION OF THE CARDIOVASCULAR SYSTEM OF THE HUMAN BODY

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Abstract
This article describes the structure of each of the cardiovascular system and its operation.

Keywords: Cardiac topography, Cardiac automatism, Endocardium, Myocardium, Epicardium, Regurgitation, Tricuspid valve, Mitral valve, Bundle of Hiss, Ashof-Tovar node, Kis-Flak node, Purkinje fibers.

Introduction

The heart pumps blood through the circulatory system. The circulatory system is a network of elastic tubes through which blood flows to the organs and tissues of the body. The circulatory system includes the heart and blood vessels: arteries, arterioles, capillaries (the smallest vessels), venules, and veins. Arteries carry oxygen-rich blood to all parts of the body. Veins return carbon dioxide and waste products to the heart and lungs. If all the veins of the human body are connected and stretched in one line, they will cover a distance of 96.5 thousand kilometers. This will be enough to wrap the ground more than 2 times.

The circulatory system includes: the heart, which acts as a pump, and blood vessels (arteries, arterioles, capillaries, venules, veins). There are two circles of blood circulation: large and small. The great circle of blood circulation starts from the left ventricle of the heart, then through the aorta, arteries and arterioles, the blood passes through the whole body in different order and reaches the cells at the level of the capillaries (microcirculation channel), giving nutrients and oxygen to the intercellular fluid, and in return, carbon dioxide and waste removal. Blood from the capillaries collects in the venules, then in the veins and is sent to the right atrium, thereby closing a large circle of blood circulation.

A small circle of blood circulation starts from the right ventricle through the pulmonary arteries. Next, the blood is sent to the lungs, where it is enriched with oxygen and returns to the left atrium through the pulmonary veins (Fig. 1).

In the atrium there is a thin muscular wall of the myocardium, which acts as a temporary reservoir of blood that enters the heart and pushes it only to the ventricles. The ventricles (especially the left side) have a thick myocardium, the muscles of which contract strongly to push the blood through the vessels for a considerable distance. There are valves between the atria and the ventricles that

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direct blood flow in only one direction (from the atria to the ventricles). On the right side of the heart, between the atrium and the ventricle, there is a tricuspid valve, and on the left side there is a bicuspid (mitral) valve. At the beginning of the vessels that leave the ventricles are semilunar valves. All heart valves not only control the flow of blood, but also prevent its reverse flow.

The pumping function of the heart consists of successive contraction (systole) and relaxation (diastole) of the muscles of the atrium and ventricle.

The blood that moves from the heart through the arteries of a large circle is called arterial (enriched with oxygen). Venous blood (enriched with carbon dioxide) moves along large circular veins. In a small circle, the opposite is true: venous blood moves along arteries and arterial blood moves along veins.

Normally, the human heart contracts rhythmically: systole alternates with diastole, forming a cardiac cycle. At rest, there are 60-80 heart cycles or heart contractions per minute. This indicator is called heart rate. At the same time as the heart contracts, the vibrations of the walls of the arteries are called the pulse, and the number of such vibrations measured in a certain time, for example, per minute, is called the pulse rate.

The pulse adequately reflects the frequency of heart contractions and is very convenient for express control of the heart when determining the body's reaction to physical stress, studying physical activity, emotional stress, etc.

Moderate physical activity helps to increase the strength of heart muscles, increase its systolic volume and optimize (reduce) heart rate. The most important thing for training the heart is the uniformity and gradual increase of loads, avoiding overloads and monitoring the condition of heart activity indicators, especially during adolescence.

Blood pressure is the pressure of blood on the walls of blood vessels. The level of blood pressure depends on the activity of the heart, the amount of blood in the bloodstream, the intensity of the flow of blood to the periphery, the resistance of the vessel walls and the elasticity of the vessels, the viscosity of the blood and etc.

Along with the changes in the work of the heart, the blood pressure in the arteries also changes: the pressure in the systole of the heart reaches its maximum level and is called systolic or maximum pressure. During the diastolic phase of the heart, the pressure falls to a certain initial level and is called diastolic or minimum. Systolic and diastolic blood pressure gradually decrease as blood vessels move away from the heart. Blood pressure is measured in millimeters of mercury (mm Hg).

Blood circulation is regulated at two levels: at the level of the heart and at the level of blood vessels. Central regulation of heart work is carried out by the centers of the parasympathetic (inhibitory effect) and sympathetic (accelerating effect) sections of the autonomic nervous system. Reflex regulation of the heart is possible through baroreceptors and chemoreceptors located on the walls of blood vessels. Baroreceptors sense blood pressure, and chemoreceptors sense changes in the amount of oxygen and carbon dioxide in the blood. The impulses from the receptors are directed to the intermediate brain, and from there to the center of regulation of the heart (medulla oblongata) and cause changes in its work. Reflex regulation also occurs through conditioned reflexes from the cerebral cortex.

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The state of blood vessels is also regulated by the central nervous system (vasomotor center), reflex and humoral. Hemodynamics can be affected only by vessels with muscles in their walls, and these are, first of all, arteries of different levels. Parasympathetic impulses cause vasodilation (vasodilatation), and sympathetic impulses cause vasoconstriction (vasoconstriction). When the vessels expand, the speed of blood movement decreases, blood supply decreases and vice versa. Humoral regulation of blood circulation is provided by adrenaline and vasopressin hormones, which causes narrowing of the lumen of blood vessels around internal organs and expansion in muscles. Acetylcholine and histamine hormones cause the diameter of blood vessels to expand.

REFERENCES

1. A. Ahmedov. O‘.Mirsharapov. T.Sagatov. H.Rasulov. // ANATOMIYA // darslik –2018y. 81-85 betlar.
2. A.E.Eshonqulov, Sh.M.Ahmedov// ODAM ANATOMIYASI VA FIZIOLOGIYASI//: darslik –Toshkent 2010y. 69 bet.
3. A.Qodirov// NORMAL FIZIOLOGIYA//: tibbiyot institutlari talabalari uchun o‘quv adabiyoti –Toshkent. 135-136 betlar.
4. E.Nuritdinov // ODAM FIZIOLOGIYASI // Toshkent 2005. 43-44 betlar.
5. To‘xtayev Q.R. Gistologiya Sitologiya Embriologiya // darslik –Toshkent, 2021 y. 476 bet.
6. To‘xtayevQ.R.// Gistologiya Sitologiya Embriologiya// darslik –Toshkent, 2021 y. 479 bet.

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