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Study of Physiology of Blood Vessels

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Abstract:

In this article, an understanding of the doctrine of hemodynamics. Movement of blood in vessels and the factors that ensure it. Blood pressure and factors affecting it. Blood velocity, arterial and venous pulse. Management of blood vessels. Reflexogenic parts and their importance.

Keywords:
Hemodynamics, hydrodynamics, blood vessels, aorta, artery vessels, arterioles, venous vessels, vena cava, capillaries, vascular anastomosis, blood flow rate, blood pressure, maximum pressure, minimum pressure, pulse (pressure) difference, pulse, arterial pulse, vein pulse, sphygmography, sphygmogram, phlebography, phlebogram, vascular tone, sympathetic nerve fiber, parasympathetic nerve fiber.

Introduction

An understanding of the doctrine of hemodynamics. Movement of blood in vessels and the factors that ensure it. Hemodynamics is the study of the flow of blood through the veins. Hydrodynamics is the study of fluid flow through tubes. Since blood vessels are tubes by nature, and blood is a liquid, the flow of blood through the vessels obeys the laws of hemodynamics and hydrodynamics.

So, like other fluids, blood flows from a place of high pressure to a place of low pressure.

When the heart works in a rhythm, divides the blood into the veins and shoots it out in separate portions, the blood flows continuously in the veins in a continuous stream.--

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This allows the blood to flow undisturbed through larger arteries and through arterioles and capillaries.

So, if the main reason for blood flow in arterial vessels is pressure, blood flow from venous vessels to the heart is caused by 3 factors: Contraction of muscles and compression of venous vessels. Valves inside veins. Negative pressure inside the chest.

When the muscles contract, the veins are compressed and move the blood forward. The valves in the veins do not allow the blood pushed forward to go back. The negative pressure in the chest is formed periodically during the diastole of the heart. This ensures the movement of blood towards the heart.

Blood pressure and the factors affecting it. Blood pressure is the pressure exerted by the blood on the vessel wall due to the work of the heart. It mainly depends on the work of the heart and the tone of the vascular wall. Arterial vessels in the body are like branches of a tree, branching and narrowing in diameter, and its resistance to the flowing blood increases. As a result, the blood pressure will also decrease.

Therefore, the highest pressure is observed in the aorta, and the pressure gradually decreases as it moves to the arteries and capillaries.

The pressure in small-diameter veins is very low (equal to 58 mm Hg) and decreases in large veins.- As a result, the pressure in the vena cava even becomes negative.

During the systole of the heart ventricles, the pressure in the arteries increases to a maximum, and during diastole it decreases to a minimum level. Accordingly, two types of blood pressure are distinguished: Maximum (systolic) pressure. Minimum (diastolic) pressure.The amplitude of pressure change between systolic pressure and diastolic pressure is called pulse pressure or pulse difference.Pulse waves of blood pressure are not observed in arterioles and capillaries. There are two methods of blood pressure measurement: Blood pressure method and Bloodless method.

It is very difficult to determine blood pressure by blood method.A mercury manometer is used to determine blood pressure in arteries, and a water manometer is used for low pressure in veins. Capillary blood pressure is measured by the Krog method. A bloodless method is widely used to determine blood pressure. A sphygmomanometer is used for this purpose.

Factors affecting the blood pressure index: Acceleration and deceleration of the heart. Narrowing and expansion of the diameter of the vessels. Increase and decrease in blood volume. A lot of blood loss. Blood viscosity. Resistance of arterioles and capillaries to blood. Systolic and minute volume of the heart. Physical work. Nervous system. The state of the organism. The time of day and the temperature of the external environment. Animal type, breed, age, productivity, etc.

Acceleration of the heart, narrowing of the diameter of the vessels causes an increase in blood pressure and vice versa. A lot of blood loss from the veins causes a drop in blood pressure. Blood pressure is lower at night than during the day.

As the animal ages, blood pressure increases due to the loss of elasticity of blood vessels. An increase of 10 l of breast milk causes a 30 mm increase in blood pressure. The pressure in the small blood circulation is 56 times lower than the pressure in the large blood circulation.-

Blood velocity, arterial and venous pulses. The movement of blood in the veins in the body, that is, the speed of flow, is different in different veins. The narrowest part of the vascular system is the aorta. Blood: 400-500 mm/sec in the aorta. Blood in medium-diameter arteries is 150-200

mm/sec. 0.5 mm/sec in capillaries. 614 cm/sec in medium-diameter veins. It moves at a speed of 20 cm/sec in the veins.

The total sum of the diameters of capillary vessels in the body is on average 800 times greater than the diameter of the aorta.

Since there are more veins than arteries in the body, the pressure in them is lower.

Blood circulation time is the time taken by a blood particle to circulate through all the vessels in the large and small blood circulation circles. Blood circulation time: 40 seconds in horses. 32 seconds in cattle. 14 seconds in sheep. 13 seconds in goats. In rabbits, it is 8 seconds.

4/5 of the blood circulation time is spent in the large blood circulation circle, and 1/5 in the small blood circulation circle. Because the blood vessels of the small blood circulation circle are short and have a large diameter. The blood vessels of the large circulatory circle are long and small in diameter.

A pulse or pulse is the rhythmic undulation of the walls of blood vessels due to the activity of the heart. Two types of pulse are distinguished in the body: Arterial pulse and Venous pulse

The pulse of the artery depends on the activity of the ventricles of the heart. Because the heart pumps blood into the aorta in a certain rhythm, in parts. The pulse of the artery spreads much faster than the speed of blood flow. For example, if the speed of blood flow in the aorta is 400-500 mm/sec, the pulse wave propagates with a speed of 79 m/sec. So, the pulse spreads 1418 times faster than the blood in the aorta.- ---

As it moves away from the heart, the pulse wave fades away and remains unknown in the capillaries. Arterial pulse can be determined by palpation: from the external jaw artery in horses and large horned cattle, from the femoral artery in small animals. Due to the thick layer of subcutaneous fat in pigs, it is more difficult to detect the pulse by palpation.

Arterial pulse can be studied by graphically recording it using a sphygmograph. Sphygmogram to the recorded line is called

The pulse is defined by the following symbols: Frequency-the number of contractions and expansions of the heart per unit of time.Rhythm is the repetition of pulse waves in equal intervals of time. Velocity is the propagation of pulse waves along the vessel walls. Height is the extent to which the pulse wave can expand the vessel wall. Pulse force is the force required to press against the vessel wall for the pulse wave to disappear.

According to Pulse-Rate: accelerated or slowed down. According to the frequency: more or less. According to the rhythm: with or without rhythm. Depending on how much the pulse wave can expand the vessel: high or low. Depending on the strength: it can be loose or hard (strong or weak). The pulse changes during various diseases. Therefore, determination of the arterial pulse is of great importance in the diagnosis of various diseases in the body.

The venous pulse depends on the activity of the heart chambers. The venous pulse is mainly observed in the large vena cava near the heart. A pulse wave is not recorded in small, small-diameter veins. Venous pulse phlebograph device can be learned by recording. The recorded curve is called a phlebogram. Learning to record the venous pulse is of great importance in examining the heart.

Management of blood vessels. Reflexogenic parts and their importance. All blood vessels in the body expand as a result of various influences. This is called blood vessel tone.-

Blood vessel tone is controlled by sympathetic and parasympathetic nerve fibers of the central nervous system.-

There are nerve fibers that constrict and dilate blood vessels: Vasoconstrictors–are nerve fibers belonging to the sympathetic nervous system, which increase the tone of the vessels and constrict the vessels. However, the coronary arteries, the nerves that control the cerebral vessels, are an exception, because the walls of these vessels expand when the sympathetic nerve fibers are stimulated. Vasodilators are nerve fibers that reduce the tone of blood vessels and expand blood vessels, some of which belong to the parasympathetic nervous system, but most of them are part of the trunk of the sympathetic nervous system.

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