BLOOD CIRCULATION AND DEFECTS OF DEVELOPMENT IN THE EMBRYO

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Abstract: During the period of development and birth, the embryo receives all the nutrients and oxygen necessary for life from the mother's body. This process is carried out by satellite. This process happens as follows. There are three vascular structures in the umbilical cord: two umbilical arteries and one umbilical vein. As with the minor circulation, the umbilical arteries carry deoxygenated blood from the fetus to the placenta; and the umbilical vein returns oxygen- and nutrient-rich blood from the placenta to the fetus. After entering the body of the fetus, this oxygenated blood must be efficiently distributed throughout the body. However, in order for this to happen, the circulatory system of the unborn baby has a number of unique anatomical features that allow blood to circulate to the capillary beds where it is most needed.

Key words: foramen ovale, ductus arteries, ductus venosus, umbilical artery, placenta, umbilical cord, ductus venosus, heart defect, atherosclerosis, hypertrophy, ligation

These anatomical features: - oval hole. - ductus arteries - ductus venozusi Anatomy and physiology of umbilical arteries Umbilical arteries exist only during embryonic life. They are the first branch of the internal or hypogastric iliac artery, which joins the abdominal wall until it forms the abdomen, where it becomes the umbilical cord after birth. There are two umbilical arteries, each of which comes from one of the iliac arteries: right and left. Umbilical arteries carry partially deoxygenated blood from the fetus to the placenta. There, the blood releases carbon dioxide and receives oxygen to return to the body of the fetus through the umbilical vein. It is

important to note that this is partially oxygenated blood, because it is the same type of blood that circulates in the body of the fetus. However, compared to the blood from the umbilical vein, the oxygen content is low. After birth, the umbilical arteries disappear, and medial umbilical ligaments appear on the anterior abdominal wall. Anatomy and Physiology of the Umbilical Vein The umbilical vein originates in the placenta and passes through the umbilical cord until it reaches the fetal abdomen. Once there, it then passes through the sickle cell ligament of the liver to split into two smaller parts. One of them is the terminal vein of the umbilical artery, which joins the portal vein. From there, new blood rich in oxygen and nutrients reaches the liver. Up to 60-70% of the flow of the umbilical veins is channelized through this branch. The second branch, about 2 cm long, is known as the ductus venosus. After the fetus is born, the umbilical vein disappears and becomes the round ligament of the liver, and the ductus venosus gives rise to the venous ligament of the liver.

Anatomy and physiology of the orifice. Under normal conditions, blood flows from the right atrium to the lungs. But in intrauterine life, this is not necessary, because the lungs do not carry out any gas exchange. In this context, most of the blood in the right atrium passes directly into the left atrium through the foramen ovale. Only a small part reaches the right ventricle and pulmonary arteries and provides the minimum necessary flow for lung development. The foramen is a communication in the interatrial septum that allows blood to pass from the right side of the heart to the left without passing through the small circulatory circle. This ensures that oxygenated blood is directed to the vascular bed where it is most needed, reserving a minimum amount of partially oxygenated blood for the lungs. At this stage of development, the metabolic requirements of these organs are very low. The ovary closes spontaneously shortly after birth because the pressure in the pulmonary circuit increases after the fetus is born and breathes. If this does not occur, a congenital heart disease called "permanent foramen ovale" or "atrial septal defect" occurs, which in most cases requires surgical correction. Anatomy and physiology of the ductus arteriosus. As we mentioned earlier, most of the blood that reaches the right atrium goes directly to the left atrium. However, some of it still reaches the right ventricle and from there it passes to the pulmonary arteries. However, despite the foramen ovale, the volume of blood reaching the pulmonary artery is greater than what the lungs require. Therefore, there is a communication that stops the passage from the pulmonary artery to the aorta. This connection is called the ductus arteriosus, and it allows excess blood reaching the small circulation to be diverted to the aorta and the main circulation, leaving a minimal amount in the lungs. In addition to the

ductus venosus, blood from the liver reaches the inferior vena cava through the suprahepatic veins, and from there it reaches the right atrium. Due to the difference in blood density in the ventus venosus and suprahepatic veins, they do not mix and reach the right atrium in parallel streams. A few minutes after birth, due to pressure changes in the blood circulation, the venous channel closes and disappears completely from 3 to 7 days. Its remains give rise to the venous ligament of the liver.

Heart defects are persistent defects, defects and changes in the anatomical structure of the heart; interferes with normal blood flow. A distinction is made between congenital and acquired heart disease. Congenital heart defects occur as a result of incorrect formation of the fetal heart and large vessels of the heart during embryonic development. In the early period of pregnancy, poisoning of the mother's body, suffering from some diseases, biological effects of ionizing rays, genetic diseases and other factors are the causes. In infancy (up to 1 year of age), incomplete development of the cardiovascular system (for example, open arterial passages or incomplete completion of the foramen ovale) is also included in Heart defects.

Heart disease can be congenital or acquired.

The most common types of Congenital Heart Diseases are: various combinations of abnormal paths between the large and small blood circulation circles, as well as narrowed or occluded areas in the large vessels of the heart (for example, the pulmonary artery and aorta), or the wrong location of these vessels; mixed vices; defects related to the number and structure of heart chambers.

Depending on the degree of mixing of arterial and venous blood, some congenital heart defects occur with cyanosis (blue defects) and some without cyanosis (white defects). It depends on the direction in which the blood flows (direction of the shunt), the level of pressure increase in the pulmonary artery, and the condition of the heart muscles. Physical maldevelopment of the child, paleness or blueness, shortness of breath, changes in the size and position of the heart, heart murmurs, etc. are typical signs of congenital heart defects.

Patent ductus arteriosus

Patent ductus arteriosus, or PDA, is a heart defect that can develop soon after birth. This affects the blood flow through the baby's lungs. Mild PDA may not need treatment, but some children with the defect may require catheterization or surgery.

PDA causes babies to bleed too much into their lungs. As the baby develops in the womb, the opening between the aorta and the pulmonary artery (ductal arteriosus) allows blood to bypass the baby's lungs and go directly to the body. Blood does not have to go to the lungs first, because the mother supplies oxygenated blood to the

baby through the placenta. The ductus arteriosus should close on its own within a few days after birth. If the foramen does not close, this connection between the arteries is patent or patent ductus arteriosus. Small connections may not cause problems, but larger connections can cause a number of symptoms and require closure. Causes of patent ductus arteriosus.

Treatment

Symptomatic PDA can be treated with both surgical and non-surgical methods. Conservative - Newborns without unpleasant symptoms can be observed simply as an outpatient.

Surgically, the DA can be closed by ligation (although support in preterm infants is mixed). [8] This can be done manually and can be closed, or with intravenous plugs or plugs that cause intravascular thrombus formation.

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