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PHYSIOLOGICAL CHARACTERISTICS OF NEWBORNS

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Abstract: This article analyzes the physiological characteristics of newborns, their differences in the functioning of organs and systems in the first month of life, and their adaptation mechanisms in the body. The features of the postnatal functioning of such important systems in the baby's body as the respiratory, cardiovascular, digestive, and central nervous systems are described. Also, normal physiological conditions observed in newborns (for example, physiological jaundice, weight loss) and ways to manage them are considered. This information is of great importance for pediatric practice.

Key words: newborn, physiology, body adaptation, neonatal period, respiratory system, cardiovascular system, digestive system, nervous system, physiological jaundice, immune system, thermoregulation, hormonal changes, weight loss, pediatrics, children's health.

The newborn (neonatal) period is one of the most complex and at the same time the most responsible stages in human life. This period includes the first 28 days of life from the moment of birth. During this time, the baby must adapt to the external environment physiologically, biochemically and immunologically. These adaptation processes are manifested by major changes in the functioning of the main organs and systems of the body - the respiratory, cardiovascular, digestive, nervous and immune systems.

Changes in the concentration of insulin, adrenaline, thyroid hormones and other biologically active substances ensure the rapid adaptation of the baby to the external

environment. In particular, the function of the alveoli in the lungs, the formation of the respiratory circulatory system, the control of body temperature, and the emergence of suckling reflexes are integral parts of this adaptation.

Physiological jaundice, weight loss, hormonal changes, and innate reflexes observed in newborns are also considered normal, but their correct assessment and control are of great importance in pediatric practice. This article provides a comprehensive overview of the physiology of the neonatal period, providing useful information for practicing physicians and medical students.

Respiratory system. The process of breathing in a newborn begins at birth. As a second sign of life, the alveoli fill with air when the baby's lungs open for the first time, and a transition from an aqueous environment to an air environment occurs. In this process, the respiratory center (respiratory center of the brainstem) is stimulated by hypercapnia, hypoxia, and cold shock. Surfactant plays an important role in the full functioning of the lungs, preventing the collapse of the alveoli. Surfactant deficiency can lead to neonatal respiratory distress syndrome.

Nervous system. In newborns, the central nervous system is not fully formed. As a result, they clearly have congenital reflexes (sucking, swallowing, Moro, Babinski, grasping reflexes in the arms and legs). These reflexes persist until 2–3 months of life and gradually disappear. With the activation of the nervous system, the child's perception, movement, and reaction to the environment increase.

Digestive system. The baby's digestive system is adapted only to breast milk. The stomach capacity is very small - approximately 30–35 ml. Enzyme activity, especially lipase and amylase, is low. Therefore, feeding other than milk is not recommended for babies. The adaptation process in the digestive system lasts 6–8 weeks.

Immune system. The immune system in newborns is not sufficiently developed. Active immunity in them has not yet been formed, and passive immunity is provided mainly by immunoglobulins (IgG) transmitted by the mother through the placenta

and antibodies (IgA) received through breast milk. Therefore, babies are highly susceptible to infections.

Thermoregulation. The thermoregulation system of newborn babies is not sufficiently active. They are quickly affected by the external temperature, which increases the risk of hypothermia or hyperthermia. In babies, heat is produced by a tissue called “brown fat”. However, since this reserve is limited, it is very important to keep the baby in a warm environment.

Hormonal changes. During the neonatal period, some physiological conditions are observed in the baby due to hormonal changes. In particular, physiological jaundice (bilirubin concentration increases on the 3rd-5th day), weight loss (up to 5-8% of birth weight), followed by recovery, hormonal mastitis, and gynecological discharge are all normal conditions. They should be under the supervision of a doctor, but they will pass on their own.

Conclusion: The newborn baby's body is not like an adult human body, but a developing, not yet fully formed biological system with its own physiological characteristics. During this period, any changes in the functioning of organs and systems occur rapidly, therefore, it is necessary to carefully monitor and assess the baby's condition.

Indicators such as physiological jaundice, weight loss, congenital reflexes, respiratory rate and heart rate may be within the norm, but they must be distinguished from pathology. Also, in the process of adaptation of the baby to the external environment, the weakening of the immune system and thermoregulation capabilities can in some cases lead to clinical conditions.

That is why knowledge of neonatal physiology is of great importance for specialists working in the field of pediatrics. Because in order to correctly assess any clinical condition, find solutions and implement preventive measures, it is necessary to know physiological norms. This article is aimed at covering these issues and can serve as an important source for education and practice in medicine.

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