The paradigm of the vitreum morphology of the human eye, thanks to clinical and fundamental research on the rehabilitation and replacement of transparent eyes, dictates a deeper analysis of the available concepts of sources of development, structure, and the interaction of cellular diffrons in the transparent eyes, given the limited availability of biomaterials [1]. Therefore vitreoretinal surgery based on modern conceptions of the structure of the eye is a complex task in connection with the special histophysiology and anatomical relationships of the retina and vitreous body (CT) [2]. Some authors consider disturbances in the system of vitreoretinal interrelations, as a result of the phenotypic heterogeneity of the KIF11 gene, a representative of the kinesin family 11 associated with retinopathy. Maggio E, Polito A, Guerriero M, Prigione G, Parolini B, Pertile G. (2017) indicate the important role of St in the development of age-related macular degeneration (AMD). Reva G.V. with et al. found that with glaucoma CT is undergoing changes associated with destruction, degeneration and fragmentation of its fibrillar core: with open-angle glaucoma, hypohydration of the stroma of the anterior part of the CT occurs, and in the closed-angle gland, hyperhydration occurs. Reducing the level of collagen, the destruction of the collagen core, the loss of its property to retain water leads to hyperhydration of the whole CT, increasing the load on the drainage system of the eye. The basis of the macromolecular CT skeleton, which performs the skeletal and form-building function, is a three-dimensional network of type II collagen, proteoglycans and hyaluronic acid, which forms an entangled spongy molecular polyanion network filling the space between randomly oriented collagen fibrils and having a stabilizing effect on them, preventing contact of fibrils. Despite the abundance of works devoted to the study of the eye, the vitreous humor still remains the least studied structure: there is no complete picture of the processes of transformation of its matrix in norm and in pathology. Abdo M, Haddad S, Emam M. (2017) provides comprehensive data on the development of the organ of sight in rabbits, while similar studies on human material are clearly insufficient. In the prenatal development of the human eye, carotenoids are found: in the vitreous body – lutein and its oxidized forms; in the lens – oxidized forms of lutein. The albumin content in the eye of the human fetal eye has a maximum value significantly higher than the level of albumin in the adult body's CT, at 17–22 weeks and decreases by the 28th week, reaching a level characteristic of the adult eye. Alpha-fetoprotein (AFP) in the vitreous eye of human fetuses is found simultaneously with albumin at the same stages of development. In the eyes of human fetuses (15–28 weeks of pregnancy), the presence of lutein is detected, which is not detected in the eye of an adult person, but disappears after the 28th week of the fetal period. The content of carotenoids decreases by the 28th week, and in 30-week-old human fetuses, carotenoids are not detected. The increased content of these proteins in the CT only in the prenatal period, coinciding with the period of intensive growth of the eye, suggests that this rise should be associated with morphogenetic processes.

VASCULOGENESIS IN THE ORGANS OF THE HUMAN EMBRYON

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Introduction. Sources of development and the laying of organs of the human embryo are of great importance for the full development of the fetus [8,11]. At the present stage, there are very limited and contradictory data on the morphology and vasculogenesis in various organs of the human embryo [1, 5 ,10]. At the present stage, it is not known how epigenetic mechanisms can control the regulation of angiogenesis in embryo development.Increasing evidence suggests that multipotent stem cells are harbored within a vascular niche inside various organs. Although a precise phenotype of resident vascular stem cells (VSCs) that can function as multipotent stem cells remains unclear, accumulating evidence shows that multipotent VSCs are likely vascular pericytes (PCs) that localize within blood vessels. These PCs are multipotent, possessing the ability to differentiate into various cell types, including vascular lineage cells [11].

Absence of exhaustive data on the sources of vasculogenesis in the structure of the embryo and the dynamics of the development of vascular organ pools has determined the direction of our scientific research [7, 9].

Aim. To study the features of the development of blood vessels in systems of visceral organs and skin of the human embryo.

Material and methods. The study used material of 48 human embryos at the age of 3 to 8 weeks of prenatal ontogenesis.

Results. It is established that in the period from the 3rd to the 4th week in the body of the embryo there is an uneven laying of the blood vessels. In the ectomesenchyme surrounding the cerebral bladder of the cephalic end of the embryo, large capillaries appear, filled with megaloblasts. The mesenchyme appears later in the trunk region, capillaries and blood islands in it are absent in this period. In the tissues of the heart, lungs, liver, walls of brain blisters and neural tube there are no blood. The liver of the human embryo is represented by a network of trabeculae from hepatocytes, the cells of the network are filled with megaloblasts. These morphological findings differ from those of other authors describing vasculogenesis in the liver of mouse embryos. Our data are in accordance with the data of other authors that in some organs of a developing human the endothelium is a derivative of the cells of the developing organ that come into contact with megaloblasts and receive the corresponding direction of differentiation as a result of intercellular interactions [3 , 4].

We noted that already in the embryonic period in the parenchyma of the liver, in contact with megaloblasts, and in the ectomesenchyme surrounding the cerebral bubbles, cells bearing receptors to markers CD68 and CD163 [2]. We assume that vasculogenesis in the liver of a human embryo develops similarly to this process described in the spleen and liver in the example of rats Goldman O, Han S, Hamou W, Jodon de Villeroche V, Uzan G, Lickert H, Gouon-Evans V. (2015) [6].

Discussion. Our data do not fit into the classical concept of vasculogenesis in the tissues of a human embryo. The obtained results testify to the necessity of continuing the scientific search on this issue. Many factors necessary for physiological angiogenesis and the complexity of regulating space-time interactions in the development of vasculogenesis of the embryo dictate the direction of efforts to address these issues.

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