DOI: 10.5281/zenodo.3233928
UDC: 617.749-003.283

Aqueous humor's biochemical composition in ocular pathologies

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Manuscript received March 12, 2018; revised manuscript May 10, 2019

Abstract

Background: Being analogous to a blood surrogate, the aqueous humor has an important role in the regulation of the homeostasis of the ocular tissues. It has many functions: provides nutrition, removes excretory products, transports neurotransmitters, stabilizes the ocular structures, influences the intraocular pressure, and participates in the immune response against invading pathogens and inflammation. Aqueous humor's unique composition (electrolytes, proteins, biologically active substances, and organic solutes) is required to maintain adequate functionality of the ocular system. Its secretion is a complex biochemical reaction that gives specific properties and makes the difference from other human fluids. Different factors (traumatic, physical, chemical, pharmacological) and eye pathologies influence its composition, modifying its physiological properties, and cause pathological conditions in the anterior segment. In the last decade, it was made massive progress in the characterization of the composition of aqueous humor in different pathologies (glaucoma, myopia, keratoconus, age-related macular degeneration, branch retinal vein occlusion, etc.). It determined the biomarkers for eye's pathologies and identified the progression of the disease.

Conclusions: The detailed knowledge of biochemical and physiological properties of aqueous humor is necessary in understanding the pathophysiology of eye's diseases. The significant variations in the differentially abundant changes in human aqueous humor may be relevant for future diseases treatment in order to get favorable outcomes in patients. Specific markers for pathologies represent nowadays an important field of research. These markers are necessary for early diagnosis and selecting the proper treatment for each individual case by stopping the clinical disease progression.

Keywords: aqueous humor, composition, pathological conditions.