Correlation between ERG Response and Blood Flow in Glaucoma Patients
Kursycheva N.I., Kiseleva T.N., Khodak N.A., Irtegova E.Y.
Ophthalmological Center of the Federal Medical and Biological Agency (Moscow, Russia), The Helmholtz Moscow Research Institute of Eye Diseases*

Electroretinography (ERG) is a promising and highly sensitive method for early detection of function loss of viable retinal ganglion cells [4,6]. Abnormal ocular blood flow and/or vascular dysregulation are considered to play an important role in chronic tissue stress in open-angle glaucoma [8]. However, only a few studies demonstrate a correlation between ocular/cerebral blood flow and electrophysiological function of the retina and optic nerve in glaucoma [1,3].

**Purpose:** To study the correlation between retinal biophysical response and retinal blood flow in glaucoma patients.

**Methods:** Electrophysiological data (ERG and VEP, Toney EP-1000) was recorded in 12 POAG patients (age 59±11.3 years, mean IOP 20.3±3.5 mm Hg). Blood flow velocity in ocular vessels was measured using VULOSUN 730 Pro Ultrasound System (“Kretz”) with a 10-16 MHz linear probe. Doppler imaging of the vessels was performed using VULOSUN 730 Pro Ultrasound System (“Kretz”). Blood flow velocity was measured in the ophthalmic artery (OA), short posterior ciliary arteries (SPCA), central retinal arteries (CARA), central retinal vein (CRA) and vortex vein (VV). Correlation between electrophysiological parameters and blood flow velocity was calculated using the “SPSS 11.0 for Windows” software.

**Results:** Blood flow velocity reduction in all the vessels, including OA, SPCA, CRV and VV was demonstrated. Moreover, ERG parameters and blood flow velocity in ocular vessels correlated with each other. The ERG b/a wave ratio (K-index) is considered to be a good indicator of retinal ischemia in early glaucoma and low blood flow velocity in CRV in glaucoma in comparison with the control group. An increased K-index in advanced glaucoma might be explained as activation of glial cells in response to tissues ischemia.

**Conclusions:**
1. The obtained results might be explained as activation of glial cells during glaucoma progression and suggest the importance of venous blood flow in glaucoma pathogenesis.

**References**