Ocular Perfusion Pressure and Blood Flow Fluctuations during Dorzolamide versus Timolol Add-on Therapy in Prostaglandin Analogue Treated Glaucoma Subjects

(1) Eye Clinic of Kaunas Medical Academy of Lithuanian University of Health Sciences; Kaunas; Lithuania
(2) Glaucoma Research and Diagnostic Center, Indiana University School of Medicine, Indianapolis, IN. USA.

Purpose:
To evaluate fluctuations in the ocular perfusion pressure (OPP) and retrobulbar blood flow (RBF) parameters during dorzolamide vs timolol add-on therapy in open-angle glaucoma (OAG) patients previously treated with prostaglandin analogue (Pg).

Methods:
35 OAG patients, 31 women (85.7 percent) (age 62.8(8.5)) were evaluated in a 3 month randomized, cross-over, single-masked study. During experiment ocular perfusion pressure (OPP), diastolic ocular perfusion pressure (DPP), blood pressure (BP), mean arterial pressure (MAP) were assessed 4 times per day (8-12-16-20 h). RBF was measured 2 times per day (8-20h) using Color Doppler imaging in the ophthalmic (OA), central retinal (CRA), nasal (nPCA) and temporal (tPCA) posterior ciliary arteries. Each vessel peak systolic velocity (PSV) and end-diastolic velocity (EDV) were assessed and vascular resistance (RI) calculated.

Results:
During both add-on therapies IOP was statistically significantly lower as compared to latanoprost baseline (15.7±2.4; 14.9±2.2 using dorzolamide and 14.2±1.9 mmHg using timolol, p<0.05). Dorzolamide add-on therapy showed smaller IOP (2.0±1.4), SPP (13.3±7.9), systolic BP (13.5±8.7) and diastolic BP (8.4±5.4) fluctuations as compared to both Latanoprost baseline or Timolol add-on therapies. Higher difference between morning and evening BP was correlated to decreased evening CRA EDV in timolol group (c=-0.41; p=0.01). With increased MAP in the morning or evening hours, we found increased evening OA RI in timolol add-on group (c=0.400; p=0.017; c=0.513; p=0.002 accordingly). Higher MAP fluctuations were related to impaired RBF parameters during evening hours – decreased CRA EDV (c=0.408; p=0.015), increased CRA RI (c=0.576; p<0.001) and nSPCA RI (c=0.356; p=0.036) in dorzolamide group and increased nSPCA RI (c=0.351; p=0.04) in timolol add-on group. OPP fluctuations correlated with increased nSPCA RI (c=0.453; p=0.006) in timolol group. OPP fluctuations were not related to IOP fluctuations in both add-on therapies (p<0.05).

Conclusions:
Dorzolamide add-on therapy showed lower fluctuations in IOP, SPP and BP. Higher variability of daytime OPP led to impaired RBF parameters in the evening.

References: