Background:
Multiple sclerosis (MS) is an autoimmune disease often associated with vascular dysregulation and increased tendency to vasospasm (1). It may be due to increased endothelin-1 production by activated lymphocytes and subsequent endothelial dysfunction (2) (Fig 1). Diminished blood flow in retinal arteries was detected by Colour Doppler Imaging (CDI) in MS patients (2,3,4,5).

Optic nerve atrophy sometimes occurs in the course of MS usually as the consequence of optic neuritis. Among MS patients with optic nerve atrophy there are some who present not typical but glaucomatous features of optic disc damage (6,7). There are suggestions that incidence of glaucomatous optic neuropathy (GON) may be higher in MS patients than in normal population (7). Unstable optic nerve head perfusion with ischaemia/reperfusion damage secondary to vascular dysregulation is indicated as a relevant component in the pathogenesis of glaucomatous optic neuropathy (8).

Ocular pulse amplitude (OPA) recorded by Pascal dynamic contour tonometry (DCT) simultaneously with intraocular pressure (IOP) represents haemodynamic IOP fluctuations and is given as a difference between “systolic” and “diastolic” IOP. OPA indirectly reflects the choroidal perfusion. It can be useful to evaluate optic nerve blood flow as the most of the optic nerve head blood supply is provided with peripapillary choroid. Low OPA might be an independent risk factor for GON (8). OPA correlates with CDI resistive index (RI) in the peripheral vessels in glaucoma patients and healthy controls (9).

Aim:
The aim of the study was to evaluate OPA in patients suffering from multiple sclerosis (MS) with and without structural features of glaucomatous optic neuropathy (GON).

Patients and Methods:
A total of 39 MS patients (9 males and 30 females) mean age: 39 years, ranged from 22 to 62, were recruited for the study and in 37 of them (74 eyes) underwent stereoscopic optic nerve head examination, HRT, and OCT evaluation of retinal nerve fiber layer to detect structural features of GON.

Results:
Among 39 patients recruited for the study 4 demonstrated structural features of GON in at least one eye (Fig 2).

Mean OPA in 33 MS patients without GON (66 eyes) was 2,45 mm Hg (SD ± 0,97) whereas mean OPA in 4 MS patients with GON (8 eyes) was 1,78 mm Hg (SD ± 0,69) (Fig 3). None of the patients showed increased IOP (above 21 mmHg). Mean IOP was 15,1 mm Hg (SD ± 2,88) in MS patients without GON and 15,0 mm Hg (SD ± 3,09) in MS patients with GON (p=0,36) (Cochran-Cox test).

Conclusion:
Ocular pulse amplitude (OPA) is diminished in multiple sclerosis (MS) patients demonstrating structural features of glaucomatous optic neuropathy (GON) as compared with multiple sclerosis (MS) patients without GON, similarly to primary open angle glaucoma patients, especially those with typical IOP (10,11). This result may suggest a common pathway of disturbed choroidal perfusion in developing glaucomatous damage.

References: