

**Integrity of
glaucomatous
neurodegeneration
from eye to visual
pathways**

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Glaucoma represents a group of neurodegenerative diseases characterized by structural damage to the optic nerve and the slow, progressive death of retinal ganglion cells. Histopathological findings in the optic nerve (ON), corpus geniculatum laterale (CGL) and visual cortex in glaucoma were reported. ON atrophy and degeneration was reported in studies conducted with conventional magnetic resonance imaging (MRI). There are conflicting reports with Occipital Proton MR Spectroscopy. The techniques that the first functional and structural findings have been obtained are functional MRI (fMRI) and Diffusion-Tensor MRI (DTI), respectively. fMRI detects increased neuronal activity via changes in blood oxygenation, DTI is based on the movement principle of fluids in a plane connected to the nerve.

Recently we observed statistically significant correlation of glaucomatous neurodegeneration between eye and visual pathways with techniques developed with 1.5T MRI. ON and CGL damage and cortical hypofunction were shown with DTI and fMRI, respectively. In previous papers of ours, variability of serum oxidative stress biomarkers relative to biochemical data and clinical parameters of glaucoma patients, neuroprotective effects of oral versatile antioxidants, association between glaucoma and lipid oxidation have been demonstrated; implying once more, glaucoma is not only an ocular pathology.

Strategies independent from IOP, concerning the area beyond the optic nerve head, are needed in the evaluation and treatment of glaucoma. Better understanding of retrobulbar glaucomatous damage will enable us to determine more efficient diagnosis, follow-up and treatment strategies and facilitate the answering of some questions which remain unknown about this disease.

Biography

Kaya N Engin is an ophthalmologist and PhD on Biochemistry. His current affiliation is Bagcilar Education and Research Hospital, Department of Ophthalmology, Istanbul/Turkey. He has a strong focus on neuroprotection in glaucoma. He is member of ARVO, EVER, Society of Free Radicals and Antioxidants Research (Turkey). He received 3 national awards. He is author of 18 papers, 3 book chapters, more than 50 presentations and serving as an active member of glaucoma division of Turkish Ophthalmology Society, reviewer of 6 elite international journals.