

Neurodegeneration in retina and optic nerve diseases

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The process of neuronal cell death following different types of injury involves apoptosis. Blocking the apoptotic cascade leading to cell death may prevent cell death and consequent loss following neuronal injury (neuroprotection). Loss of neural visual cells means effective loss of vision. Hence, neuroprotection strategies are needed to maintain neuronal integrity or to keep damaged cells functioning. In glaucoma, intraocular pressure (IOP) lowering aims to prevent the insult that leads to retinal ganglion cell (RGC) injury. Neuroprotection aims to maintain function despite injury. Over the past 20 years, many laboratory studies of potential neuroprotective agents have yielded promising results. However, some agents have subsequently failed to show significant neuroprotective activity in humans. Therefore, any evidence of neuroprotection in humans must be confirmed by controlled human clinical trials.

This presentation will review the basic and clinical evidence in support of the action of different neuroprotective agents for retinal cells, as applied to major fields of retinal and optic nerve diseases, with special emphasis to photoreceptor and retinal ganglion cell degeneration.