

Abstract

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Neuroprotectin D1 inhibits retinal ganglion cell death following axotomy.

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OBJECTIVE AND METHODS: Neuroprotectin D1 (NPD1), a docosahexaenoic acid-derived autacoid, is an endogenous neuroprotective and anti-inflammatory mediator that is generated in the retina and brain. The effects of exogenous NPD1 on retinal ganglion cell (RGC) apoptosis and the role of 12/15-lipoxygenase (Alox15) in retina were evaluated after optic nerve transection (ONT).

RESULTS: Treatment with NPD1 was associated with significant protection against RGC death. The percentage of RGC survival in NPD1-treated group was 30% at 2 weeks after ONT as compared with 12% of RGC survival in the ONT group without treatment. Endogenous NPD1 was a predominant lipid autacoid in uninjured and axotomized retinas. Alox15 mRNA expression was upregulated in retinas following ONT suggesting that amplification of 12/15-lipoxygenase (12/15-LOX) may represent a neuroprotective response in the rat retina. The density of RGCs was higher in the normal retina of 12/15-LOX-deficient mice as compared with congenic controls.

CONCLUSION: Hence, the resident NPD1 has a potential role in the physiological and pathophysiological responses of the retina.

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