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The Role of NAD+ and Nicotinamide (Vitamin B3) in Glaucoma: A Literature Review

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Abstract : Glaucoma is a collection of irreversible optic neuropathies which, if left untreated, lead to severe visual field loss. These diseases are a leading cause of blindness across the globe and are estimated to affect approximately 80 million people, particularly women and people of Asian descent.1This represents a major burden on healthcare systems worldwide. Recently, there has been increasing interest in the potential of nicotinamide (vitamin B3) as a novel option in the management of glaucoma. This review aims to analyse the currently available literature to determine whether there is evidence of an association between nicotinamide adenine dinucleotide (NAD+) and glaucomatous optic neuropathy and whether nicotinamide has the potential to prevent or reverse these effects. The literature showed a strong connection between reduced NAD+ levels and retinal ganglion cell dysfunction through multiple different studies. There is also evidence of the positive effect of nicotinamide supplementation on retinal ganglion cell function in models of mouse glaucoma and in a study involving humans. Based on the literature findings, a recommendation has been made that more research into the efficacy, appropriate dosing, and potential side effects of nicotinamide supplementation is needed before it can be definitively determined whether it is appropriate for widespread prophylactic and therapeutic use against glaucoma in humans.

Keywords : glaucoma, nicotinamide, vitamin B3, optic neuropathy
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