Frequent swimming goggle wear is not associated with thinning of the retinal nerve fiber layer: results of the Western Australian Eye Protection Study

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Purpose: Swimming goggles are commonly worn to improve underwater visibility. Previous studies have demonstrated a small but significant transient increase in intraocular pressure while wearing certain types of swimming goggles, which over time may damage the optic nerve head representing a significant risk factor for glaucoma development and progression among people who swim regularly. The aim of this study was to determine if glaucoma incidence is increased among swimmers.

Methods: As part of the ongoing Western Australian Eye Protection Study, we performed a comprehensive ocular examination on 259 members of local swimming clubs and 281 individuals who do not swim regularly and have no history of glaucoma. Intraocular pressure (IOP) was measured using iCARE tonometry and visual fields testing was performed using Humphrey SITA fast 24-2. Retinal nerve fibre layer thickness was assessed using spectral domain optical coherence tomography.

Results: 35 individuals with high myopia (spherical equivalent less than -6.00 diopters in either eye) were excluded from the analysis. The mean age of our cohort was 57.3 years (range 18.9-94.8 years). Swimmers spent on average 3.5 hours per week in the water, 76% always or often wore goggles while swimming and 79% had been using swimming goggles regularly for more than 10 years. Based on measurements of visual fields we did not detect any new cases of glaucoma in our cohort of frequent swimmers. Similarly, we found no difference in thickness of retinal nerve fibre layer between swimmers and non-swimmers: mean right global thickness (GT) of 94.2 μm vs 94.0 μm (p = 0.741) and left GT 94.9 μm vs 95.1 μm (p = 0.881).

Conclusion: These findings suggest that frequent swimming goggle wear over time does not lead to an increased risk of glaucoma.