The fellow eye in NAION: report from the ischemic optic neuropathy decompression trial follow-up study.

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This study was a follow-up study to the original Ischemic Optic Neuropathy Decompression Trial (IONDT) in 1995. The original study was a multicenter, randomized clinical trial in which optic nerve decompression surgery was compared to careful, clinical follow-up in patients with non-arteritic anterior ischemic optic neuropathy (NAION). The original trial showed no benefit of optic nerve decompression surgery. The current study followed the patients from this original trial for at least 5 years, to assess the risk of NAION development in the fellow eye (i.e., the other, previously non-affected eye), and the variables that might contribute to an increased risk of developing NAION in the fellow eye.

Experimental design: Patients in the original IONDT trial were enrolled based on the following criteria: 1) age > 50 years, 2) sudden loss of vision within the previous 14 days, 3) a relative afferent pupillary defect, 4) optic nerve head (disc) edema, 5) visual acuity 20/64 or worse, and 6) an abnormal visual field. They were also eligible if they had a previous NAION in the fellow eye. They were excluded if they had any medical condition that could result in nonischemic optic neuropathy or excessive surgical risk, a diagnosis of temporal arteritis, an inability to give informed consent, or any other ophthalmologic condition that makes a reliable visual acuity measurement difficult. All patients were followed at set regular intervals. Baseline patient demographics and comorbidities were also recorded, as well as the use of aspirin.

Results: A total of 418 patients with NAION were enrolled in the original IONDT trial. Of these, 258 patients were randomized and 160 patients were only observed (either because they declined randomization or had initial visual acuity better than 20/64). Enrolled patients were mostly men (61%), white (95%) and ranged from age 50-89 years. Via a baseline examination, the study neuro-ophthalmologists determined that 80 patients (19%) had an episode of NAION in the fellow eye before enrollment. There were a few additional patients who were found to have optic nerve head pallor ("optic neuropathy") at baseline (8 patients) or on follow-up (4 patients), but they lacked sufficient corroborating evidence to diagnose NAION, or it was secondary to an alternative etiology. Overall, there were 128 out of the total 418 patients (30.6%) who had fellow eye NAION either at baseline or follow-up (*cumulative prevalence*). If we exclude those who already had fellow eye NAION or had optic neuropathy that was not convincing for NAION etiology, there were only 326 patients who were "at risk" of developing fellow eye NAION. Of these, 48 patients (14.7%) developed new NAION in the fellow eye (*cumulative incidence*). The median interval to the development of fellow eye NAION was 1.2 years, with nearly half (46%) occurring during the first year. Otherwise, in terms of baseline characteristics associated with the incidence of fellow eye NAION, baseline first eye visual acuity of 20/200 or worse and diabetes were both associated with a significantly increased risk of NAION in the fellow eye. There was no significant association with aspirin use, age, sex, or smoking. About half of the patients with bilateral NAION had Snellen visual acuities within three lines of each other.

Conclusion: Overall, the study found a cumulative prevalence of 30.6% and cumulative incidence of 14.7% of fellow eye NAION over a median follow-up period of 5.1 years. It is possible that additional NAION events occur beyond 5 years but this was not specifically captured in this study. About half of the new cases of NAION occurred during the first year of follow-up, and both diabetes and poor visual acuity in the first eye (VA of or worse than 20/200) were significantly associated with a higher risk. Ultimately, this study is significant in that prior studies had reported fellow eye NAION prevalence rather than incidence, so the data here helped us to understand risk factors for the development of NAION in the fellow eye.

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