Clinical Factors Influencing the Visual Prognosis of the Fellow Eyes of Normal Tension Glaucoma Patients with Unilateral Field Loss

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Aim
To investigate the influence of several clinical variables on the development of visual field loss in the ‘second eye’ of patients with normal tension glaucoma (NTG) presenting with unilateral field loss.

Methods
Patients with NTG and unilateral field loss at presentation were selected from a cohort of 403 consecutive diagnoses of NTG. The state of the visual field, ‘normal’ or with a visual field defect, was defined using the Advanced Glaucoma Intervention Study (AGIS) template. Where available, optic disc planimetry was carried out on stereo photographic images taken at presentation. Measurements of the topography of each of these optic discs were compared with morphometric values from a group of normal subjects, allowing for differences in age and disc size. For each patient the percentage of the relative neuroretinal rim (NRR) area was calculated. The time taken to develop a visual field defect was related to clinical factors including age, sex, peak and mean diurnal intraocular pressure (IOP), refraction, relative NRR area, and the AGIS score of the fellow eye at presentation.

Results
54 patients were included in the study. The median (range) follow up time was 49.2 (11.1–116.7) months. 14 (26%) patients developed field loss in the eyes with initially normal field. The estimate of the median time to field loss onset was 95.1 months. Field damage developed more rapidly in women and in patients with greater AGIS score in the contralateral eye at the beginning of follow up (HR 0.20 (0.04; 0.93); 1.19 (1.02; 1.41) respectively). Little evidence of any association was found between time to onset of field loss and each of age, refraction, and peak or mean diurnal IOP. Planimetric disc analysis was carried out in 33 (61%) patients. Of these 10 (30%) developed field loss in the eyes with initial normal field at a median follow up of 95.1 months. After adjustment for sex and AGIS, relative NRR area was found to be significantly related to the time of onset of field damage, the greater the reduction in relative NRR area, the shorter the time to visual field loss (HR 0.93 (0.89; 0.99)).

Conclusions
NTG patients with unilateral field loss are at high risk of developing field damage in the eyes with an initially normal visual field. In this study, the visual prognosis of the eye with the normal visual field at presentation was found to be influenced by the extent of the reduction in relative NRR area together with the severity of field damage in the contralateral eye at presentation.

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