Role of the stimulus size in the generation of optokinetic nystagmus in normals and in patients with retinitis pigmentosa

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BACKGROUND: To find out the smallest stimulus size still able to elicit optokinetic nystagmus (OKN). To discuss the differences in the generation of OKN between normals and patients with tunnel vision. METHODS AND PATIENTS: OKN was elicited monocularly with black and white stripes of 2 degrees moving on a screen temporally-to-nasally or nasally-to-temporally at velocities of 15, 30, 45, and 60 degrees /s. In healthy subjects (n = 10) the size of the stimulus was gradually increased from minimal 8 degrees x 0.5 degrees to maximal 48 degrees x 10 degrees. OKN was elicited in retinitis pigmentosa (RP) patients (n = 2) with visual field reduced to the central 10 degrees. OKN gain was measured using infrared oculography. OKN response was considered as normal if it was within 2 standard deviations of the mean OKN of age-matched control groups (n = 29). RESULTS: In healthy subjects the size of the stimulus necessary to elicit normal OKN gain was smaller at low velocity of 15 degrees /s (16 degrees x 1 degrees ) than at higher velocities of 30, 45, and 60 degrees /s (16 degrees - 24 degrees x 3 degrees ). Normal OKN gain was measured in the RP patients only at the low velocity of 15 degrees /s. CONCLUSIONS: Small stimuli are sufficient in normals to elicit good OKN answers. Therefore, poor OKN gain in RP patients may not be explained by their tunnel vision only. We postulate that in these patients the reduction of gain is due to a multifactorial decrease of their visual perception related to disorders of the visual field, the visual acuity, and the contrast sensitivity.