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Post illumination pupil response: relation to glaucoma

Laxmikanth Kankipati

University of Alabama at Birmingham, USA

The pupillary light reflex is a reflexive constriction of the pupil in response to an increase in ocular illumination. It is an indispensable clinical measure of visual neurological and autonomic function, which until recently was thought to be driven only by rods and cones. In 2000, a novel photopigment, melanopsin, was discovered in primate and rodent inner retina that was expressed by a unique class of retinal ganglion cells, which apart from receiving rod and cone inputs are intrinsically photosensitive, henceforth termed intrinsically-photosensitive retinal ganglion cells (ipRGCs). In behaving macaques and a limited number of human subjects, these ipRGCs were shown to be responsible for the

sustained pupillo constriction that is often observed following the cessation of a short wavelength visual stimulus, henceforth termed post-illumination pupil response(PIPR). Using a newly developed, wide-field optical system, we compared PIPR in normal subjects and in patients with moderate to severe glaucoma by presenting a 60°, 10-second light stimulus (13 log quanta/cm2/s retinal irradiance), and recording pupillary responses for 50 seconds after light cessation. All normal subjects (n=37) displayed a significant PIPR (1.4mm,p<0.0001). We also observed a significant decrease in the PIPR in glaucomatous patients (n=16; PIPR 0.6mm, p<0.05) when compared to age-matched controls (n=19; PIPR 1.3mm, p<0.001). For the patient population, the magnitude of PIPR was inversely correlated with the measured visual field loss of the tested eye. Therefore, this test has the potential for use as a clinical tool in evaluating patients with glaucoma and other melanopsin-related disorders.

Biography

Dr. Laxmikanth Kankipati has a medical degree (M.B.B.S) from University of Health Sciences, Vijayawada, India. He also has Masters degree in Public Health (MPH, Epidemiology) and a doctoral degree (PhD) in Vision Sciences from the University of Alabama at Birmingham (UAB), Birmingham, Alabama. He is currently a Research Associate in the Department of Ophthalmology at UAB. He is a member of the Association for Research in Vision and Ophthalmology. He currently has 2publications in peer-reviewed journals and 1 paper in review.