

*Br J Ophthalmol* doi:10.1136/bjophthalmol-2014-304872

## Clinical science

# Relationship between halo size and forward light scatter

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**Received** 3 January 2014

**Revised** 10 March 2014

**Accepted** 15 April 2014

**Published Online First** 9 May 2014

## Abstract

**Purpose** To determine the relationship between the size of a halo induced by a glare source and forward scatter or visual acuity (VA) in healthy eyes.

**Method** Measurements were made in the right eyes of 51 healthy individuals of mean age  $29.3 \pm 7.5$  years. Halo radius was measured using the Vision Monitor and low luminance ( $1 \text{ cd/m}^2$ ) optotypes presented at a distance of 2.5 m. The visual angle subtended by the radius of the halo was calculated in minutes of arc (arc min). Forward scatter or, straylight, was measured using the compensation comparison technique. Best-corrected distance VA was measured using high contrast (HC) (96%) and low contrast (LC) (10%) Bailey-Lovie logMAR letter charts under photopic ( $85 \text{ cd/m}^2$ ) and mesopic ( $0.15 \text{ cd/m}^2$ ) luminance conditions.

**Results** Mean halo radius was  $202 \pm 43$  arc min ( $3.4 \pm 0.7^\circ$ ) and mean retinal straylight was  $0.95 \pm 0.12$  log units. Mean photopic distance HC-VA and LC-VA were  $-0.02 \pm 0.06$  and  $0.12 \pm 0.09$  logMAR, respectively. Mean mesopic distance HC-VA and LC-VA were  $0.35 \pm 0.11$  and  $0.74 \pm 0.11$  logMAR, respectively. Forward stepwise regression analysis revealed that halo radius was significantly correlated with straylight ( $r=0.45$ ) and mesopic LC-VA ( $r=0.48$ ), but not with photopic HC-VA and/or LC-VA and mesopic HC-VA.

**Conclusions** In healthy eyes, the larger the halo size induced by a given glare source, the greater the forward-scatter (straylight) and worse the mesopic LC-VA. Halo size seems to be independent of photopic HC-VA or LC-VA and mesopic HC-VA.