

Differences In The Miosis Response To Increased Light Intensity Using The X-480 Filter In Persons Over 65 Years Old

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Purpose: To assess the effects of the X-480 filter (cutoff λ 480 nm) on mesopic and scotopic pupil diameters in persons older than 65 years, we examined 196 eyes of 98 subjects (52 men/46 women) aged 65 to 101 years.

Methods: Pupil diameters were measured under three levels of luminance (high mesopic (HM) 4 lux; low mesopic (LM) 0.4 lux; and scotopic (S) 0.04 lux) using the Procyon binocular pupillometer P2000 (Procyon Instruments Ltd.) after a 5 min period of adaptation to mesopic conditions (3 cd/m²). For each measurement, 10 photographs of each eye were taken over a 10 second interval.

Results: Mean (\pm SD) pupil diameters (mm) determined at the 3 luminance levels were: 4.84 ± 1.0 for S; 4.43 ± 0.9 for LM; and 3.65 ± 0.7 for HM without the X-480 filter; and 4.84 ± 1.0 ; 4.61 ± 0.9 ; and 4.09 ± 0.9 , respectively with the filter. At the highest luminance level (4 lux), the filter led to an increase in pupil diameter of around 10% in both sexes, this increase being significantly greater in women (3.88 ± 0.9 men; 4.31 ± 0.9 women). No differences were observed at the other two luminance levels. When the subjects were stratified by age, differences in the pupil reflex were observed for the different luminance levels without the use of the filter: at 85 years for S; 75 years (women) and 85 years (men) for LM; and 75 years for HM. In general, with or without the filter, the age limit for an appreciable difference in the response to occur remained stable at 75 to 80 years of age.

Conclusions: Both light intensity and age provoke significant changes in pupil