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LOSS OF NASAL RETINAL SENSITIVITY MAY NEGATIVELY IMPACT ABILITY TO READ ACROSS THE ETDRS LETTER CHART

Oral

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Purpose:

Choroideremia patients often exhibit asymmetric retinal sensitivity loss and significantly constricted visual fields and report difficulties fixating on ETDRS chart letters. The study investigates whether ETDRS letter error positions relate to asymmetrical retinal sensitivity in choroideremia, RPGR-associated retinitis pigmentosa (RPGR-RP), exhibiting symmetrical sensitivity loss, and control participants.

Methods:

Monocular visual acuity (VA) was measured using the standard ETDRS letter chart at 4m. Total errors per column were counted for rows up to and including 1 row below the “threshold” row (lowest row with up to two errors) and were analysed with a weighted formula to generate weighted error scores for each participant. Macular sensitivity was assessed using Macular Integrity Assessment microperimetry (Centervue SpA, Padova, Italy). Mean temporal-minus-nasal macular sensitivity was calculated. Correlation analyses were applied. A positive correlation indicates that greater letter errors occurred on the side of the chart visualised towards the relatively less sensitive retina.

Results:

Sixty eyes from 30 choroideremia (median age 44.1 years [IQR 33.8-47.8]), 28 eyes from 14 RPGR-RP (median age 29.7 years [IQR 25.3-35.9]) and 42 eyes from 21 control (median age 25.9 years [IQR 22.7-30.6]) participants were examined. Results showed significantly greater temporal macular sensitivity in the RE of choroideremia participants (Wilcoxon signed-rank, P=0.038) but not LE. RPGR-RP participants and controls showed no asymmetry in macular sensitivity. There was a significant positive correlation between weighted error scores and macular sensitivity asymmetry in the RE of choroideremia participants (Spearman’s rank, ρ=0.40, P=0.031). No correlation was found in RPGR-RP or control eyes.

Conclusions:

Significant asymmetry in macular degeneration in the RE of choroideremia participants may affect ability to localise ETDRS chart letters and therefore should be considered a source of variability. Using single crowded optotype VA test with forced choice paradigms, such as the Electronic Visual Acuity (EVA) (EMMES©), may overcome this issue.