Preserved functional and structural integrity of the papillomacular area correlates with better visual acuity in retinitis pigmentosa

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PurposeLinking multifocal electroretinography (mfERG) and optical coherence tomography (OCT) findings with visual acuity in retinitis pigmentosa (RP) patients.
DesignProspective, cross-sectional, nonintervention study.
SubjectsPatients with typical RP and age-matched controls, who underwent SD-OCT (spectral domain OCT) and mfERG, were included.
MethodsMfERG responses were averaged in three zones (zone 1 (0°-3°), zone 2 (3°-8°), and zone 3 (8°-15°)). Baseline-to-trough- (N1) and trough-to-peak amplitudes (N1P1) of the mfERG were compared with corresponding areas of the OCT. The papillomacular area (PMA) was analyzed separately. Correlations between best-corrected visual acuity (BCVA, logMAR) and each parameter were determined.
Main outcome measuresComparing structural (OCT) and functional (mfERG) measures with the BCVA.
ResultsIn RP patients, the N1 and N1P1 responses showed positive association with the central retinal thickness outside zone 1 (P≤0.002), while the central N1 and the N1P1 responses in zones 1, 2, and 3- with the BCVA (P≤0.007). The integrity of the IS/OS line on OCT showed also a positive association with the BCVA (P<0.001). Isolated analysis of the PMA strengthened further the structure-function association with the BCVA (P≤0.037). Interactions between the BCVA and the OCT, respectively, the mfERG parameters were more pronounced in the RP subgroup without macular edema (P≤0.020).
ConclusionIn RP patients, preserved structure-function of PMA, measured by mfERG amplitude and OCT retinal thickness, correlated well with the remaining BCVA. The subgroup analyses revealed stronger links between the examined parameters, in the RP subgroup without appearance of macular edema.