( ) R1 ( ) R2 ( ) R3 (X) PG0 ( ) PG1 ( ) Estagiário ( ) Tecnólogo ( ) PIBIC

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Service (sector)
Neuro-Ophthalmology

Nº CEP
654/06

Pattern electrorretinograms for the detection of neural loss in patient with permanent visual field defect from chismal compression

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Purpose: To evaluate the ability of full field and hemifield pattern electroretinogram (PERG) parameters to differentiate between eyes with band atrophy (BA) of the optic nerve and healthy eyes.
Methods: Twenty-four eyes from 24 consecutive patients with permanent temporal hemianopic visual field defects and BA of the optic nerve from previous chiasmal compression and 24 healthy subjects were studied prospectively. All patients were submitted to an ophthalmic examination including Humphrey 24-2 SITA Standard automated perimetry. Full field and hemifield (nasal and temporal) stimulation transient pattern electroretinogram (PERG) were recorded using checkerboard screens. Amplitudes and peak times for the P50 and N95 as well as the overall P50+N95 amplitude were measured. The intraocular N95:P50 amplitude ratio was calculated. Comparisons were made using Student's t test. Receiver operating characteristic (ROC) curves were used to describe the ability of PERG parameters to discriminate both groups.
Results: Full field P50, N95 and P50+N95 PERG amplitude values were significantly smaller in eyes with BA when compared with control eyes (P < 0.001). Nasal and temporal hemiafield PERG studies revealed significant differences in N95 and P50+N95 amplitudes measurements. No significant difference was observed regarding peak time values as well as N95:P50 amplitude ratio. Nasal and temporal hemifield PERG values showed no significant difference both in eyes with BA and in controls. Using the 10% percentile of normals as the lower limit of normal, 15 of 24 eyes were considered abnormal using the best discriminating parameters.

Conclusions: Transient PERG amplitudes measurements were efficient at differentiating eyes with BA and permanent visual field defect from normal controls. However, PERG parameters from hemifield stimulation were not able to identify asymmetric hemifield neural loss and that future studies are necessary for clarify this issue.