

Electrophysiology in Glaucoma

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OBJECTIVES: Electrophysiological testing of the visual system has been continuously used in studies involving the evaluation of retinal ganglion cells (RGC) and the diagnosis of glaucoma. This study aims to review the results of recent studies regarding the clinical applicability of electrophysiological tests to glaucoma.

METHODS: A systematic review of the literature was carried out by 2 independent reviewers using the PubMed and EMBASE electronic databases, searching for articles published in English from 2014/01/01 to 2019/07/01 using a combination of the following keywords: ("glaucoma" OR "ocular hypertension") AND ("electrophysiolog" OR "electroretinogra" OR "ERG" OR "mfERG" OR "Pattern-reversal electroretinography" OR "PERG" OR "mfPERG" OR "photopic negative response" OR "pattern electroretinogram" OR "visual evoked potential" OR "multifocal electroretinography" OR "multifocal electroretinogram" OR "electro-oculography" OR "multifocal VEP" OR "mf-ERG") . A total of 38 studies were selected and the data of 29 of them were tabulated in this review.

RESULTS: Among the 30 studies selected, the photopic negative response (PhNR) and the reversal pattern electroretinogram (PERG) were found to be the major methods used to record the electroretinographic responses generated by the RGC. Their multifocal versions and the multifocal visual evoked potential (mfVEP) were also proposed during this period. In general, the results underscored a consistent but general correlation between the amplitude and latency measures and routine tests for glaucoma, such as perimetry and optical coherence tomography.

DISCUSSION: In agreement with previous reviews, clinical electrophysiological testing of the visual system reasonably matched with both the structural and functional analyses for glaucoma. No definitive indications of these tests have been established either at early detection or during follow-up of the disease, and easier protocols and better topographical correspondence with current glaucoma tests are warranted for their routine use.

<http://www.ncbi.nlm.nih.gov/pubmed/31809397>