Multifocal Visual Evoked Potentials in the Differential Diagnosis of Acute Optic Neuritis

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Purpose: To demonstrate the use of multifocal visual evoked potential (mVEP) objective perimetry in the differential diagnosis of acute optic neuritis.

Background: Studies into objective perimetry,1-5 demonstrate that objective visual field assessments can be performed and applied in clinical practice. The mVEP objective perimetry technique can reliably map visual field loss and the results strongly correlate with subjective perimetry findings.4 The Accumap mVEP perimetry also provides a means for assessing the VEP from 58 individual segments of the field of vision, rather than an overall central response.

Methods: Patients with a differential diagnosis of acute optic neuritis were recruited through a metropolitan clinic. The monocular mVEPs were recorded using the Accumap system. The inbuilt Accumap normal patient database was used for comparison of amplitudes and latencies throughout the visual field, and a probability plot was used to identify possible scotomas.

Results: Sixteen patients were recruited with possible optic neuritis (ON). In 12 patients a diagnosis of acute ON was confirmed based on detailed clinical history and disease progression. In the other four patients diagnosis of ON was subsequently ruled out. All 12 patients with a diagnosis of acute optic neuritis showed a significant reduction of amplitude and latency delay on mVEP. Humphrey visual field, however, was abnormal in only 7/12 (58%) cases. Remaining four patients had normal mVEP test results and normal Humphrey visual fields.

Conclusion: The Accumap mVEP can be used to detect acute optic neuritis and differentiate it from other conditions, and is more sensitive than subjective Humphrey perimetry. This is particularly useful to clinicians when the patient has an atypical presentation. The multifocal visual evoked potential is an important method for assessing the state of retino-geniculo-cortical pathways and can be a useful tool for neuro-ophthalmological diagnosis.

References:

Keywords: multifocal visual evoked potential, optic neuritis

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