Higher sensitivity of visual evoked potentials compared to optical coherence tomography in clinically isolated syndrome

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Background: Visual evoked potentials (VEPs) and optical coherence tomography (OCT) can detect demyelination and neurodegeneration in the visual pathway, with higher sensitivity of VEPs reported in clinically definite MS and first-ever optic neuritis. Our aim was to compare the sensitivity of VEPs and OCT in patients with Clinically isolated syndrome – CIS suggestive of MS.

Methods: Seventy-one consecutive patients with CIS (43 females, mean age 34.3 $\pm$ 9 years) underwent VEPs and OCT with measure of VEP latency and of thickness of the peripapillary retinal nerve fibre layer (RNFL) in both eyes.

Results: Considering all patients, VEPs were abnormal in 43.7%, whereas OCT showed abnormal RNFL values in 15.5% of patients (decreased except for 2 patients with acute ON); 8 patients (11.3%) had both abnormal VEPs and OCT, 23 (32%) had abnormal VEPs only, while 3 patients (4.2%) had abnormal OCT only (McNemar's Chi squared 13.885, P value 0.0002). When considering patients with optic neuritis at presentation (n=24, 33.8%), VEPs were abnormal in 22 (91.7%) patients and OCT in 7 (29.2%). In patients without ON, abnormal VEPs were found in 9 patients (19.1%) and OCT in 4 (8.5%).

Conclusions: The present findings of a higher sensitivity of VEPs compared to OCT in CIS is consistent with previous literature in clinically definite MS and isolated optic neuritis. OCT adds little to VEPs in detecting involvement of the visual pathway, particularly in patients with non optic neuritis presentation. Longitudinal monitoring is required to assess the comparative value of the two methods in proving optic nerve involvement as an indicator of dissemination in space and their prognostic value on the subsequent conversion to MS.