Differences in Clinical Features between Optic Neuritis in Neuromyelitis Optica Spectrum Disorder and Multiple Sclerosis

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Background: Optic neuritis (ON) is a demyelinating inflammation of the optic nerve that accounts for a considerable proportion of unilateral or bilateral acute to subacute visual loss cases. It is also one of the common manifestations in idiopathic demyelinating diseases including Neuromyelitis Optica Spectrum Disorders (NMOSD), Multiple Sclerosis (MS), Acute Disseminated Encephalomyelopathy (ADEM), and other conditions such as systemic autoimmune diseases. When there are no other manifestations or no sign of association with any specific antibodies, especially at its first presentation, it is difficult to differentiate etiologies between NMOSD-related ON (ON-NMOSD) and MS-related ON (ON-MS). Several different characteristic features of ON between the two diseases have been reported. Since treatment for MS may exacerbate NMOSD relapses, it is crucial to distinguish the two diseases as early as possible to provide appropriate and early treatment. Hence, some characteristics and radiographic findings to differentiate ON-NMOSD from ON-MS should be identified in Thai patients presenting with ON.

Objective: To compare clinical presentations, laboratories, and imaging findings in ON associated with MS and NMOSD.

Methods: A retrospective chart review was performed in patients presenting with ON. There were 59 NMOSD patients with 72 eyes involvement and 163 ON attacks, and 20 MS patients with 23 eyes involvement and 36 ON attacks.

Results: ON-NMOSD was more often found with recurrent ON and tended to be simultaneous bilateral ON involvement at their first ON attack. ON-NMOSD revealed worse visual acuity at first ON attacks and also with poorer long-term visual outcome than those of ON-MS. In the meantime, nearly half of ON-NMOSD remained to have LogMAR visual acuity $\geq 1$ at their last follow-up ($p=0.035$). Significant thinner average retinal nerve fiber layer thickness was found in the ON-NMOSD group. We found no significant differences in segmentation location of the optic nerve lesions and the length involvement between the two groups.

Conclusion: It was difficult to completely differentiate ON-NMOSD from ON-MS. However ON-NMOSD tended to be simultaneous bilateral ON involvement and poorer long-term visual outcome than those of ON-MS.

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Figure 2: Visual acuity in VA LogMAR scales at different time after the ON attack.