# NAA Discerns MS From Neuromyelitis Optica

BY MICHELE G. SULLIVAN

BANGKOK, THAILAND — Serum levels of *N*-acetyl aspartate are significantly higher among patients with relapsing-remitting multiple sclerosis and clinical syndromes suggestive of MS than they are in patients with neuromyelitis optica, and might be a valid biomarker to help distinguish the disorders.

In her study of 176 subjects, Dr. Carla Tortorella found that serum *N*-acetyl aspartate (NAA) levels were about 14 times higher in those with MS or a clinically isolated syndrome suggestive of MS (CIS) than they were in those with neuromyelitis optica (NMO). In fact, said Dr. Tortorella of the University of Bari, Italy, levels in NMO patients were the same as they were in age-matched healthy controls.

NAA is normally synthesized in neural mitochondria and leaves the cell by several methods, Dr. Tortorella said at the World Congress of Neurology: passing from neurons to oligodendrocytes where it is catabolized; passing through the astrocytes into the extracellular space and thus into the bloodstream; and passing into the cerebrospinal fluid. This process is abnormal in patients with MS, leading to increased serum NAA levels, but no studies have compared these levels in patients with MS and those with NMO.

Dr. Tortorella examined serum and CSF levels of NAA in 48 patients with relapsing-remitting MS, 20 with CIS, and 32 with NMO. She also included 76 age-matched healthy controls for comparison.

There were some baseline differences between the groups. Those with NMO were older (median 43 years) than those with CIS (28 years) or MS (38 years). Disease duration was also different: CIS, 6 months; MS, 6 years; NMO, 5 years.

The Expanded Disability Status Scale score was 1.5 in the CIS group, 2 in the MS group, and 4.6 in the NMO group. None of the MS or CIS patients were taking disease-modifying drugs, while 10 of the NMO patients were taking immunosuppressants.

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All patients submitted serum NAA samples. The levels were similarly high in those with CIS and MS (1.7 mM/L in each group). These were significantly higher than the levels found in those with NMO and among healthy controls (0.12 mM/L each).

While all of the MS and CIS patients had CSF levels available for testing, only eight of the NMO patients did, and there were no CSF samples from healthy controls. "Nevertheless, the CSF NAA levels were markedly and consistently higher in the CIS and MS patients [0.68 and 0.76 mM/L] than they were in the NMO patients [0.05 mM/L]," Dr. Tortorella said.

She found no significant association between NAA levels and age, disease duration, or disease activity. However, among those with MS, she found a significant correlation between increasing NAA levels and worsening Expanded Disability Status Scale scores.

Because the correlation between serum NAA and MS is so much stronger than it is with NMO, Dr. Tortorella suggested that NAA might be a useful way not only to help distinguish between the disorders but to measure the progression of MS, particularly in the early phase of the disease.

The findings make sense in light of the pathology of the various disorders, she said. "One theory is that NAA is higher in MS and CIS because there is more extensive and less focal impairment than there is in NMO, suggesting axonal damage that extends beyond the enhancing lesion. There also could be a defective NAA metabolism in the oligodendrocytes, which are really damaged in MS."

Dr. Tortorella did not have any conflicts of interest to declare. ■