

Anti-MOG antibodies in Pediatric Neuroinflammatory Demyelinating Diseases

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Introduction:

Central nervous system (CNS) oligodendrocyte-derived myelin contains myelin oligodendrocyte glycoprotein (MOG), a known auto-antigen in experimental and clinical inflammatory demyelinating diseases. Highly sensitive and specific anti-MOG antibody testing became commercially available in October 2017 in the United States. Thus, our understanding of anti-MOG-related CNS demyelinating disease in clinical, non-research, cohorts is limited.

Objective: To characterize pediatric anti-MOG positive patients (MOG+).

Methodology:

We retrospectively reviewed pediatric and adolescent patients presenting with neuroinflammatory symptoms to Akron Children's Hospital (ACH) from January 1, 2014 through May 24, 2019. Using Epic's Slicer-Dicer Analytic tool, we identified patients with CNS inflammatory disease diagnoses including: acute disseminated encephalomyelitis (ADEM), acute optic neuritis (AON), encephalitis, transverse myelitis, neuromyelitis optica spectrum disorder, and multiple sclerosis. Charts were reviewed for anti-MOG testing, and anti-MOG positive patients (MOG+) were included in this analysis. ACH Institutional Review Board exemption was obtained.

Results:

8/35 tested patients were MOG+. 6/8 MOG+ (75%) were female, with a mean presenting age of 7.25 years. Despite heterogeneity of presenting symptoms, ADEM was the most common diagnosis (6/8 MOG+). The other two diagnoses were AON and acute cerebellar ataxia. No MOG+ had comorbid autoimmune diagnoses, though one had an asymptomatic Leber Hereditary Optic Neuropathy gene mutation. Two MOG+ patients have chronic relapsing disease requiring disease modifying therapies; the remainder were monophasic and responded to high dose corticosteroids. Two initially MOG+ were anti-MOG negative 6-12 months after initial presentation and have not relapsed. 6/8 MOG+ have on-going neurologic symptoms or disability beyond 6 months of follow-up.

Conclusions:

In our small cohort, ADEM was the most common initial diagnosis, and MOG+ was associated with persistent neurologic disability. Ideally, as clinical phenotypes emerge, early identification of MOG+ patients may lead to faster treatment, better prognostication, and implementation of acute vs chronic treatment depending on risk for relapsing disease.