Lasting ambulatory and visual disability in patients with Neuromyelitis Optica Spectrum Disorder

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Backgrounds

- NMOSD is a rare, inflammatory CNS syndrome, which can lead to significant accrual of visual and ambulatory disability over time[1]
- Patients with NMOSD often have pathogenic autoantibodies to aquaporin-4 (AQP-4), but may also have autoantibodies to myelin oligodendrocyte glycoprotein (MOG-IgG) or no autoantibodies[2,3]
- Due to its low incidence and prevalence, the long-term disability experienced by patients with NMOSD remains incompletely described[4]
- Previous studies have indicated that patients who have MOG-positive disease are more likely to accrue lasting visual disability when compared to patients with AQP-4 disease[5]

Methods

- All clinical records at the University of Alabama at Birmingham with an NMOSD diagnosis were found using the i2b2 search engine
- A retrospective chart review was conducted to collect demographics, BMI, antibody status, and details of the clinical course
- Likelihood ratio, Chi-square test, or Fisher's Exact (FE) test used for comparisons, $p<0.05$ considered meaningful
- Kaplan-Meier survival analysis was used for non-parametric time-to comparisons
- Analysis was completed using JMP

Results

Table 1. Patient Characteristics (N=121)

Gender	**N (%)**
Female	102 (84.3%)
Male	19 (15.7%)
Race	
White	31 (25.6%)
Black	73 (60.3%)
Asian	8 (6.6%)
Hispanic/Latino	2 (1.7%)
Other	7 (5.8%)
Average age at presentation	**SD**
White	46.9 (19.6)
Black	36.6 (14.3)
Other	36.2 (10.4)
Antibody Serology	
Aquaporin-4 Antibody	83 (68.6%)
Myelin Oligodendrocyte Glycoprotein Antibody	20 (16.5%)
Seronegative	18 (14.9%)

Results

Table 2. Patient and Disease Characteristics by Antibody Status (N=121)

Characteristic, n(%) unless noted	All (121)	APQ4 (83, 68.5%)	MOG (20,16.5%)	Seronegative (18, 14.9%)
BMI				
Underweight	4 (3.3)	2 (2.4)	1 (5.0)	1 (5.6)
Normal	26 (21.5)	20 (24.1)	1 (5.0)	5 (27.8)
Overweight	27 (22.3)	19 (22.9)	4 (20.0)	4 (22.2)
Obese	64 (52.9)	42 (50.6)	14 (70.0)	8 (44.4)
Age of Presentation: Mean (SD)	39.2 (15.9)	40.3 (16.2)	38.8 (14.2)	34.6 (16.5)
Ambulatory Status (Current)				
Self-ambulatory	83 (68.5)	51 (61.4)	19 (95)	13 (72.2)
Cane	11 (9.0)	10 (8.3)	0 (0)	1 (5.6)
Walker	12 (9.9)	11 (13.3)	0(0)	1 (5.6)
Wheelchair	15 (12.4)	11 (13.3)	1 (5)	3 (16.7)
Visual Disability	49 (40.5)	30 (36.1)	8 (40)	11 (61.1)

Fig. 1: Presenting Symptom

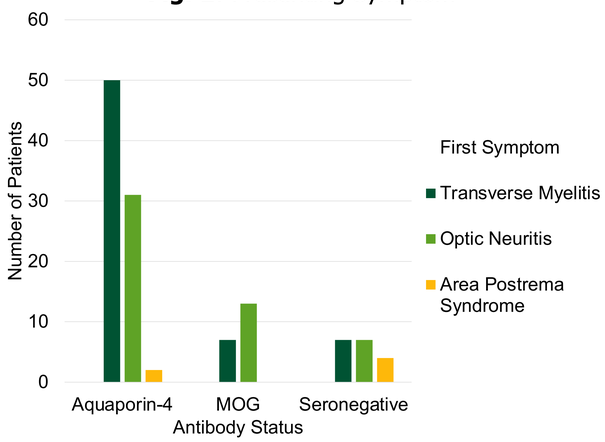


Fig. 2: Presence of Any Lasting Disability

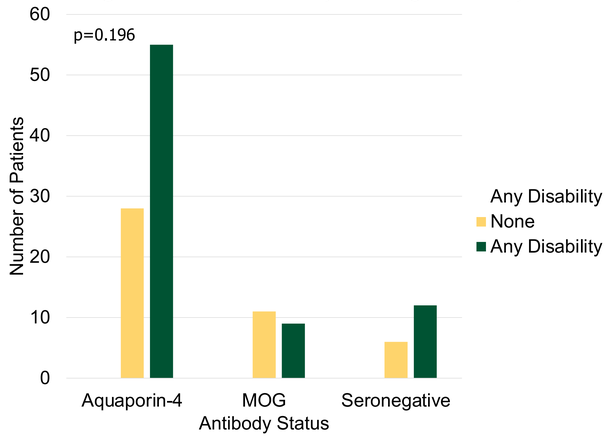


Fig. 3: Presence of Lasting Visual Disability

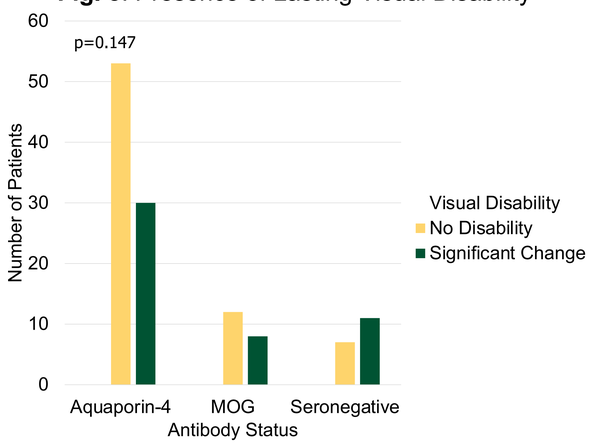
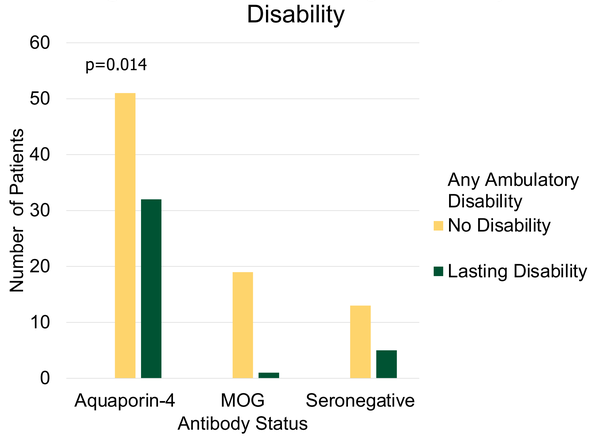


Fig. 4: Presence of Lasting Ambulatory Disability



Results

- A total of 121 patients were found to have a diagnosis of NMOSD
- Black patients were more likely than white patients to be AQP-4 positive (79.5% vs. 41.9%, p=0.0004)
- Patients who were AQP4-IgG positive were more likely than patients who were MOG-IgG positive or seronegative to present with Transverse Myelitis (60.2% vs. 35% vs. 38.9%, p= <0.001)
- Patients with AQP4-IgG autoantibodies were more likely than patients with MOG-IgG or seronegative patients to have lasting ambulatory disability (62.7% vs. 5% vs. 27.8%, p=0.014)
- Antibody status did not affect presence of lasting visual disability among patients
- Kaplan-Meier survival analysis was conducted, but did not show significant difference in disability status over time when separated by antibody status

Conclusions

- Lasting ambulatory, but not visual, disability differs by antibody status in patients with Neuromyelitis Optica Spectrum disorder.

Limitations

- Findings may be different in other geographic areas of the United States
- Our population did not include enough Asian and Hispanic/Latino patients for analysis based on race

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