Prodromal Symptoms and Health Care Utilization in Pediatric Onset Multiple Sclerosis Prior to Diagnosis

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Background

- Recent evidence suggests a prodromal period preceding the clinical onset of MS
- Prior population-based studies have shown an increase in healthcare utilization prior to first demyelinating event in adults and children[1, 2]
- Autonomic symptoms, pain, fatigue, and psychiatric symptoms are elevated in adult MS patients 5-10 years prior to diagnosis[3,4]
- There is limited data on prodromal symptoms in pediatric-onset MS (POMS)
- POMS patients reach disability landmarks at a younger age than their adult counterparts, have higher annualized relapse rates, greater MRI disease burden, and earlier brain atrophy [5-8]
- Early diagnosis of POMS is essential for the prevention of relapses and long-term disabilities

Objectives

- Evaluate trends in healthcare utilization in the period before POMS diagnosis and characterize prodromal POMS symptoms

Methods

- All patients presenting to the Pediatric MS and Demyelinating Diseases Center at Washington University between June 2011-June 2021 were screened for POMS
- 24 patients met inclusion criteria: fulfillment of the 2010 McDonald criteria for the diagnosis of MS, onset before 18 years of age, and ≥ 2 years of EMR data available prior to MS diagnosis
- Data collected: 1) symptoms -2 to 0 years before MS diagnosis and at time of MS diagnosis 2) healthcare utilization -1 to 0 and -2 to -1 years before MS diagnosis
- Reviewed EMR for ambulatory physician visits, hospital admissions, and telephone calls to physician offices

Results

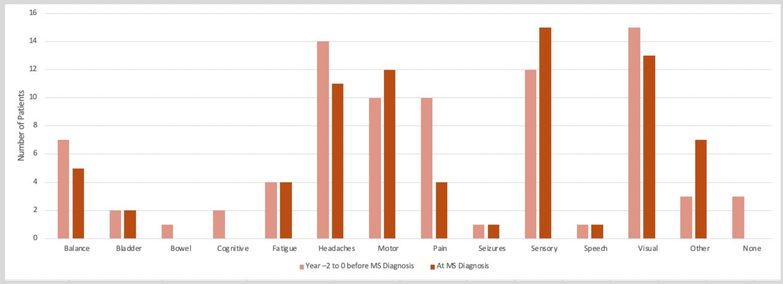

Figure 1. Neurologic symptoms present prior to and at time of MS diagnosis

Health care utilization	Year –2 to –1 before MS Diagnosis	Year –1 to 0 before MS Diagnosis
Office and ER Visits		
Total (% Neuro related)	82 (17.1%)	150 (57.2%)
Median visits/patient (IQR)	2 (3.5)	5 (4.5)
Hospital Admissions		
Total (% Neuro related)	4 (75%)	32 (93.8%)
Median visits/patient (IQR)	0 (0)	1 (0)
Phone Calls to Physician		
Total (% Neuro related)	17 (47.1%)	98 (78.5%)
Median calls/patient (IQR)	0 (0)	2 (4.5)

Table 1

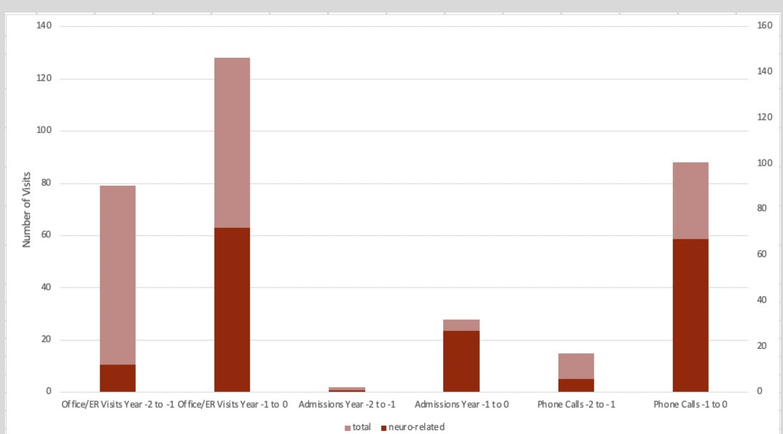

Table 1 and Figure 3. Healthcare utilization prior to MS diagnosis

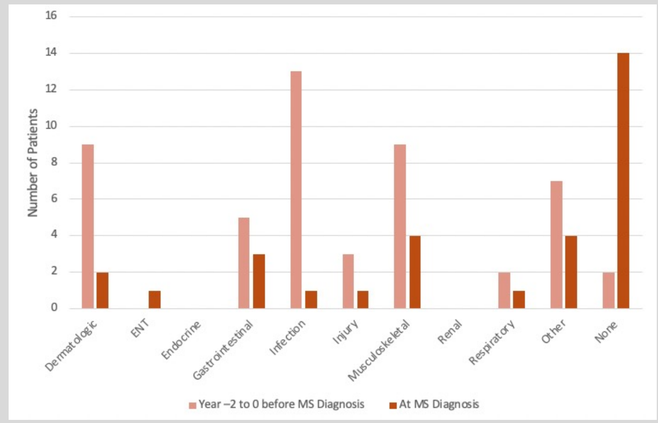

Figure 2. Non-neurologic symptoms present prior to and at time of MS diagnosis

Conclusions

- There was increased healthcare utilization in the year immediately prior to MS diagnosis
- Individuals with POMS present with a variety of neurologic and non-neurologic complaints in the two years leading up to MS diagnosis
- Our cohort data suggests the possibility of a prodromal period in POMS, as seen in the adult MS population
- Identification of prodromal symptoms may facilitate earlier referral from primary care providers to pediatric neurologists
- Our study is limited by small sample size
- Future studies should compare healthcare utilization of POMS patients prior to diagnosis vs matched controls

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