Evaluation of Multiple Sclerosis Patients' Disease Modifying Therapy Prior to and after Disease Relapse

Robert D'Eramo, PharmD; Myla Goldman, MD, MSc; S. Ross Tingen, PharmD, BCPS
University of Virginia Health System, Charlottesville, Virginia

BACKGROUND

- Multiple Sclerosis (MS) is a chronic progressive inflammatory neurodegenerative disease that affects more than 1,000,000 people in the United States and over 2.5 million people worldwide.
- The standard practice to treat relapsing MS is through disease modifying therapy (DMT) drug regimens which reduce clinical and radiographic relapses and can delay disease progression.[1]
- Treatment guidelines for MS focus on efficacy, safety and patient specific factors, but do not provide specific guidance in DMT selection.[2]
- Currently DMT escalation vs. induction are being evaluated.

OBJECTIVE

- Evaluate patient characteristics associated with step-wise DMT start or change of category after MS relapse

METHODS

Study Design

- This is a retrospective chart review of all patients with an MS diagnosis (ICD9 340.0; ICD10 G35) who visited the University of Virginia Health-System (UVA) between January 1, 2014 and March 31, 2017, during a relapse event. Patients were identified using a MS clinical database of those who received intravenous steroids since 2014. DMTs were separated into three groups based on annual relapse rate (ARR). Changes in DMT after diagnosis or relapse were the then categorized as 1, 2 or 3 step change depending on the change of drug group and if patient was treatment experienced or treatment naive (Fig. 1). Patient characteristics were then compared.
- **Exclusion criteria:** Primary or secondary progressive MS

Primary outcome

- **To evaluate the change in DMT following a MS relapse event**

Definitions

- RRMS = Relapsing remitting MS
- SPMS = Secondary progressive MS
- CIS = Clinically isolated syndrome
- DMT = Disease modifying therapy
- PPMS = Primary progressive MS
- Pulse Steroids = steroid treatment at standing intervals in time, commonly used for treatment of progressive MS

Design

Figure 1

Results

Table 1: Baseline Demographics	Treatment Naïve (n=14)	Treatment Experienced (n=53)
Age	39.8 (17-58)	40.5 (22-62)
Female Gender (%)	6 (42.9)	39 (73.6)
EDSS Before Relapse	2.5	3
EDSS After Relapse	3	3

Table 2: Treatment Naïve	1 Step (n=12)	2 Step (n=2)
Age (95% CI)	41.8 (33.3-50.2)	28
Female Gender (%)	6 (50%)	0
EDSS Before Relapse	3 (2-4)	4
EDSS After Relapse	3 (3-4)	4

Figure 2: Treatment Experienced

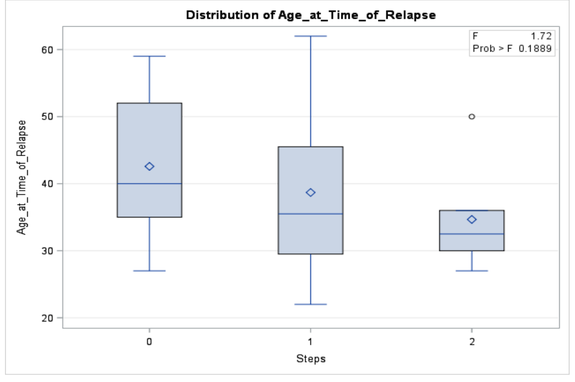

Table 3: Treatment Experienced	0 Step (n=31)	1 Step (n=16)	2 Step (n=6)
Age	42.6	38.7	34.7
Female Gender (%)	23 (74.9)	12 (75)	4 (66.7)
EDSS Before Relapse	3 (3-3.5)	3 (2.5-6.5)	2 (2-8)
EDSS After Relapse	3 (2.5-4)	3 (3-6.5)	2.5 (2-3.5)
Number of Prior DMTs	2.35	1.8	1.3
Length of Time on DMT Prior to Relapse (months)	27.7	7.5	7.3

DISCUSSION

- A total of 67 patients with RRMS who experienced a relapse were included in this retrospective chart review.
- 14 patients were considered treatment naïve.
- Patients in both groups treated with a 2-step DMT initiation were overall younger (most < 40 years old) and had a worse EDSS at time of relapse.
- 15 patients treatment experienced were not on DMT at time of relapse most commonly due to self-discontinuation or administrative error (ie. insurance lapse)
- For the treatment experienced group, DMT at time of relapse was the greatest predictor of a 2 step change (no treatment -> group 2, group 1 -> group 3) via regression analysis.
- A 2 step change occurred most frequently in patients with residual deficit
- Limitations
  - Not every relapse patient was captured in the clinic database
  - New drug approval has changed drug availability and therapy since 2014 and may have played a role in the step-wise changes

CONCLUSIONS

- Patients presenting to the UVA MS Clinic had a mean age of 40 years at time of initial relapse.
- Treatment of patients with MS relapse at UVA MS Clinic are most commonly treated with a escalation approach in DMT.
- Younger patients or those with a more disabling relapse are more frequently treated with a two-step escalation versus those treated with one-step in both the treatment naïve and the treatment experienced group.

REFERENCES

1. Gold R, Wolinsky JS, Amato MP, Comi G. Evolving expectations around early management of multiple sclerosis. Ther Adv Neurol Disord. 2010;3(6):351-367.
2. Rae-Grant A, Day GS, Marrie RA, et al. Practice guideline recommendations summary: Disease-modifying therapies for adults with multiple sclerosis. *Neurology.* 2018;90(17):777-788.

DISCLOSURES

The authors SR Tingen and R D'Eramo have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.
Dr. Myla Goldman has the following disclosure: Consulting fees: ADAMAS, EMD Serono, Sanofi, Novartis Pharmaceuticals, Teva Neuroscience; research support: Biogen IDEC, National MS Society, NIH, Novartis Pharmaceuticals,PCORI.