CG15

Cognitive Dysfunction in MS: Education Translates Science into Practice

Elaine Rudell
Projects In Knowledge
Little Falls, NJ

Patty Peterson
Projects In Knowledge
Little Falls, NJ

Jeffrey Yangang Zhang
Kessler Foundation
Research Center
West Orange, NJ

John DeLuca
Kessler Foundation
Research Center
West Orange, NJ

INTRODUCTION

- Up to 65% of patients with MS experience cognitive dysfunction/impairment at some point in the course of their disease,[1] resulting in a significant deterioration in lifestyle, social relationships, independence, and employability[1-3]
- In a self-report survey among 1797 MS patients, cognitive dysfunction was one of the most frequently reported symptoms resulting in loss of employment[4]
- Since cognitive dysfunction can occur as early as clinically isolated syndrome (CIS), it is important for clinicians to include tests that assess cognitive function in their MS patients on a regular basis, as they do with MRI tests[5]
- Physicians play a key role in the early diagnosis of cognitive dysfunction, identifying candidates for treatment, treatment selection and implementation, and monitoring of patients for improvement or treatment adjustments, and educational programs are key to changing practice behavior to improve patient outcomes
- *Multiple Sclerosis Tool Kit: Diagnosing and Understanding Cognitive Dysfunction*, an online 9-course CME curriculum, was designed by Projects In Knowledge to address gaps in knowledge, competence, and practice performance relating to cognitive function in MS patients. A total of 333 participants completed all 9 courses and received certificates

OBJECTIVE

- The objective of this study was to evaluate the effectiveness of a sample of 4 of 9 CME courses (focusing on cognitive dysfunction in MS) on clinicians' improvement in knowledge, competence, and practice performance

METHODS

- Of 333 participants completing all 9 courses, responses were analyzed for a sample of 4 courses pertaining specifically to the diagnosis and treatment of cognitive dysfunction in MS; 169 participants completed paired pre- and posttest questions

  Knowledge/Competence

  — Evaluating improvement in knowledge/competence (application of knowledge learned to practice strategies)

  Intent to Change Practice Performance

  — Intent to make changes in their practice performance (self-assessed intent to implement learnings into practice) regarding early testing and evaluation, and managing cognitive dysfunction
- The 4 curriculum courses chosen for this analysis were
  - — Patient Cognitive Reserve and MS-Related Cognitive Dysfunction
  - — Case Study: Clinically Isolated Syndrome Presenting with Cognitive Dysfunction and Aggressive MRI Findings
  - — Case Study: Cognitive Dysfunction Diagnosis and Management
  - — The Role of MRI in Assessing MS-Related Cognitive Impairment
- *P* values are based on a McNemar's test using a 1-tail test and are analyzed at a 95% confidence level

KESSLER FOUNDATION

Projects In Knowledge®
At the Intersection of Knowledge and Outcomes Since 1980

The independent CME/CE activities evaluated in this analysis were supported by an educational grant from **Biogen Idec** and **Elan**.

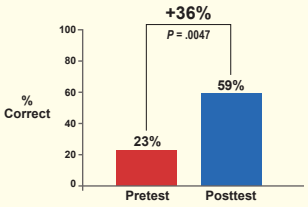
RESULTS

Course 1 Patient Cognitive Reserve and MS-Related Cognitive Dysfunction

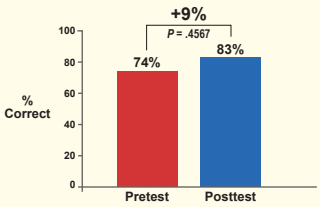
Knowledge/Competence (n = 22)

- Prior to the course, 23% of participants realized that higher cognitive reserve protects cognitive function, compared with 59% who were aware of this following the course—an increase of 36% ($P = .0047$)
- Participants showed an improved trend (+9%) in their understanding of the concept of cognitive reserve (↑ from 74% to 83%) from pretest to posttest scores ($P = .4567$)

Higher cognitive reserve protects cognitive function



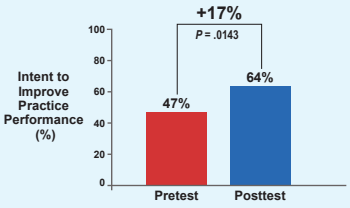
The concept of cognitive reserve refers to a patient's cerebral/neural complexity and efficiency



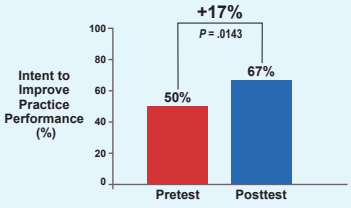
Intent to Change Practice Performance (n = 36)

- Significantly more respondents indicated they will always/very often
  - — Assess patients' cognitive reserve early in the course of MS in order to identify those at higher risk of developing cognitive impairment (47% before vs 64% after the course – +17%; $P = .0143$)
  - — Consider initiating cognitive interventions in those identified at greater risk (50% before vs 67% after the course – +17%; $P = .0143$)

Assess patients' cognitive reserve early in the course of MS to identify patients at higher risk of developing cognitive impairment



Consider instituting cognitive interventions in patients at greater risk of developing cognitive impairment

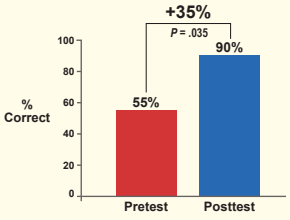


Course 2 Case Study: Clinically Isolated Syndrome Presenting with Cognitive Dysfunction and Aggressive MRI Findings

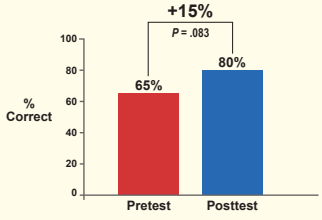
Knowledge/Competence (n = 20)

- Participants who knew cognitive impairment and brain atrophy are associated with a higher risk of conversion from CIS to clinically definite MS (CDMS) demonstrated a statistically significant increase from pretest to posttest, 55% to 90% – +35% ($P = .035$)
- A trend indicated that more participants were aware that patients with CIS are not good candidates for natalizumab therapy, from 65% to 80% – +15% ($P = .083$)

In CIS, the clinical features associated with an increased risk of conversion to CDMS are cognitive impairment and brain atrophy



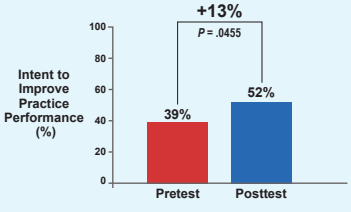
Patients with CIS are not good candidates for natalizumab therapy



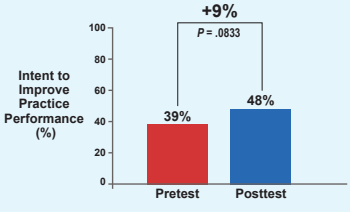
Intent to Change Practice Performance (n = 33)

- Significant increase in intent to always/very often initiate therapy with a disease-modifying treatment in patients with CIS, including cognitive impairment and brain atrophy (high risk for conversion to CDMS), with a shift from 39% to 52% – +13% ($P = .0455$)
- Trend towards always/very often considering switching patients with rapidly progressing MS to second-line treatment early in the course of disease, with a shift from 39% to 48% – +9% ($P = .0833$)

Initiate therapy with a disease-modifying treatment in CIS patients at high risk of conversion to CDMS



Consider switching patients with rapidly progressing MS to second-line treatment early in the course of disease



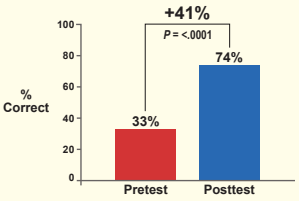
RESULTS

Course 3 Case Study: Cognitive Dysfunction Diagnosis and Management

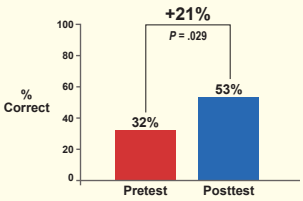
Knowledge/Competence (n = 57)

- Participants identifying the Symbol Digit Modalities Test as more sensitive than the Paced Auditory Serial Addition Test (re: processing speed deficits) showed an increase from pretest (33%) to posttest (74%) – +41% (*P* <.0001)
- Respondents identifying pharmacologic therapies that have shown some benefit in MS-related cognition showed a statistically significant increase from 32% to 53% – +21% (*P* = .029)
- Despite recognition of the possible benefit of these agents, there was no increase in the participants who felt that cognitive rehabilitation may be an option for MS patients with cognitive impairment (56% both before and after the course)

Compared with the Paced Auditory Serial Addition Test (PASAT), the Symbol Digit Modalities Test (SDMT) is more sensitive to processing speed deficits



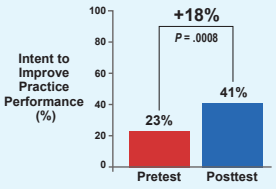
Interferon beta-1a, L-amphetamine, and donepezil have had positive, although not conclusive, findings in trials measuring effect on cognitive function in MS



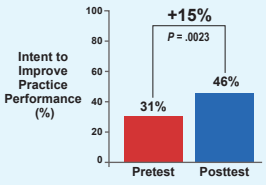
Intent to Change Practice Performance (n = 36)

- The percentage of those who would always/very often screen for cognitive impairment by administering the Symbol Digit Modalities Test, a highly sensitive test for one of the primary cognitive domains affected by MS, increased from 23% to 41% – +18% (*P* = .0008)
- Those who always/very often refer patients suspected of cognitive impairment to a neuropsychologist for evaluation increased from 31% to 46% – +15% (*P* = .0023)
- A significant increase was also seen in respondents who would always/very often consider appropriate pharmacologic and nonpharmacologic intervention to help stabilize cognitive symptoms and related functional difficulties, from 27% to 45% – +18% (*P* = .0008)

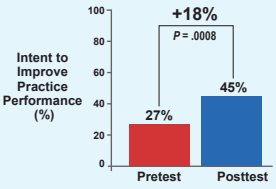
Screen for cognitive impairment in MS patients by administering the Symbol Digit Modalities Test on a routine basis, especially when impairment is suggested



When cognitive impairment is suspected, refer MS patients to a neuropsychologist for neuropsychologic evaluation



Consider appropriate pharmacologic and nonpharmacologic intervention to help stabilize cognitive symptoms and related functional difficulties in MS patients with cognitive impairment



Course 4 The Role of MRI in Assessing MS-Related Cognitive Impairment

(Knowledge/Competence n = 14; Intent to Change Practice Performance n = 20)

Participant responses showed no significant improvement in knowledge and competence (ie, knowledge of MRI techniques that assess how the brain reacts to tissue injury) or in intent to change practice performance (ie, the use of new, more sensitive MRI methodologies to assess damage to white and gray matter and to identify patients who may be at risk of cognitive impairment).

CONCLUSIONS

- Educational courses, such as *Multiple Sclerosis Tool Kit: Diagnosing and Understanding Cognitive Dysfunction,* fill important informational needs about cognitive dysfunction/impairment in MS patients

- Significant improvement in knowledge/competence
  - — High cognitive reserve protects cognitive function ($P = .0047$)
  - — Clinical characteristics associated with higher risk for conversion from CIS to CDMS ($P = .035$)
  - — SDMT more sensitive than PASAT in assessment of processing speed deficits ($P < .0001$)
  - — Some positive effects of treatments on cognitive dysfunction ($P = .029$)

- Significant improvement in intent to change practice performance
  - — Assess cognitive reserve early in MS ($P = .0143$)
  - — Consider cognitive interventions in patients at high risk for developing cognitive impairment ($P = .0143$)
  - — Treat CIS with disease-modifying therapies in high-risk patients for conversion to CDMS ($P = .0455$)
  - — Screen for cognitive impairment in MS patients by routinely using the SDMT ($P = .0008$)
  - — Refer MS patients with suspected cognitive dysfunction for neuropsychologic evaluation ($P = .0023$)
  - — Consider pharmacologic/nonpharmacologic interventions to stabilize cognitive symptoms ($P = .0008$)

- It was encouraging to see highly significant changes in the intent to improve many areas of practice performance

- Educational courses in cognitive dysfunction in MS, based on gaps and needs, not only increase participants' knowledge and competence, but more importantly, translate into the intent to make practice changes that improve treatment and patient outcomes

DISCLOSURES

Elaine Rudell: Projects In Knowledge was provided with an unrestricted educational grant from Biogen Idec. Patty Peterson: Projects In Knowledge was provided with an unrestricted educational grant from Biogen Idec. Jeffrey Yangang Zhang: Allergan, Mitsubishi Pharma America, Regeneron (consulting fees). John DeLuca: Biogen Idec, Memen Pharmaceuticals, New Jersey Devils, New York Red Bulls (consulting fees), NMSS, NIH (grants received).

REFERENCES

1. Amato MP, Zipoli V, Portaccio E. Cognitive changes in multiple sclerosis. *Expert Rev Neurother*. 2008;8:1585-1596.
2. Chiaravalloti ND, DeLuca J. Cognitive impairment in multiple sclerosis. *Lancet Neurol*. 2008;7:1139-1151.
3. Morrow SA, Drake A, Zivadinov R, Munschauer F, Weinstock-Guttman B, Benedict RH. Predicting loss of employment over three years in multiple sclerosis: clinically meaningful cognitive decline. *Clin Neuropsychol*. 2010;24:1131-1145.
4. Simmons RD, Tribe KL, McDonald EA. Living with multiple sclerosis: longitudinal changes in employment and the importance of symptom management. *J Neurol*. 2010;257:926-936.
5. Feuillet L, Reuter F, Audoin B, et al. Early cognitive impairment in patients with clinically isolated syndrome suggestive of multiple sclerosis. *Mult Scler*. 2007;13:124-127.

INSTANTLY ACCESS THESE RESOURCES

PDF of this poster
Available at:
www.projectsinknowledge.com/Kessler-pdf

Scan to download PDF

***Multiple Sclerosis Tool Kit* Education Program**
Available at:
www.projectsinknowledge.com/MS-Toolkit-1

Scan to access website