A Call to Explore the Etiology of Depression Underlying the Report of Cognitive Concerns in Patients with Multiple Sclerosis

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BACKGROUND

- The lifetime prevalence of depression in patients with MS is approximately[1]

50%.

BACKGROUND

- Cognitive impairments seen in patients with depression:
  - Learning[2]
  - Verbal memory[2]
    - Recall but not recognition[3]
  - Visual memory[2]
  - Verbal fluency[4,5]
  - Executive set-shifting[4,6,7]
  - Motor speed[8]
  - Spatial working memory[5]

BACKGROUND

- Cognitive symptoms commonly seen in patients with multiple sclerosis (MS)
  - Complex attention (e.g., multi-tasking) [9]
  - Information processing speed[9]
  - Learning and memory[9]
  - Perceptual skills[9]
  - Executive functions (e.g., problem solving, initiation, organization, planning) [9]
  - Word finding[9]

BACKGROUND

- Reasons for considering etiology of cognitive symptoms:
  - Untreated depression in MS patients has been shown to worsen, rather than resolve, over time[10,11]
  - Factors such as poorer psychological functioning and cognitive functioning have played greater roles in MS patients leaving employment than physical disability[9]
  - Depression, as prevalent as it is known to be in MS, is often under-diagnosed[11]
    - Cognitive profiles may overlap between depression and MS, but cognitive symptoms related to depression may be more modifiable[10]
  - Some cognitive tasks are more heavily impacted by different features of depression (severity, symptom type, etc.)[10]

BACKGROUND

- Summary:
  - Thus, it may not only be helpful to treatment to know if cognitive symptoms are occurring in the context of depression versus MS.
  - It may also be worthwhile to treatment to know what symptoms of depression may be most impacting cognitive functioning.

PROJECT OBJECTIVE

This study presents an initial attempt to examine **whether anhedonia** or **low mood**, two symptoms that are routinely screened for in identifying patients who might be experiencing depression, are more strongly associated with report of cognitive concerns.

WHY LOW MOOD AND ANHEDONIA

- Both anhedonia and low (depressed) mood are considered the gateway symptoms into depression[12]
- Although they often correlate, assessing for both enhances sensitivity for detection of major depressive disorder and may differentially relate to treatment outcomes[13,14,15]

WHY LOW MOOD AND ANHEDONIA

- Presence of anhedonia may signify a more severe depression, greater resistance to depression treatment, and be associated with greater cognitive impairment and involvement of particular neuroanatomical structures[10,13]

METHODS

- Participants
  - 54.8% Caucasian;
  - 44.0% African American;
  - 79.2% female
  - Age: 46.67 years (mean), 12.03 (SD), 20-81 (range)
    - 20-41 years (youngest third of the sample)
    - 52-81 years (oldest third of the sample)

METHODS
- Setting

METHODS

- Procedures and Materials
  - Health/Medical Psychology residents (interns) and fellows provide screening and consultation services to patients attending medical appointments within the MS Clinic
  - Patients are screened using the PHQ-2, PC-PTSD, a 2-item Conjoint Screener for Substance Abuse, and a problem checklist
    - The PHQ-2[14] has two items, one querying about anhedonia and the other about mood
      - Response choices for each item are 'not at all' (0), 'several days' (1), 'more than half the days' (2), 'nearly every day' (3)
      - Problems include cognitive/memory, among 17 other problem areas (e.g., adjusting to diagnosis, medication management, relationship stress, etc.)

SAMPLE CHARACTERISTICS

	Anhedonia				Low Mood	
	Yes (50%)[1]	No (50%)[1]	Yes (58.1%)[16]	No (41.9%)[16]	Yes (50%) [1]	No (50%) [1]
Ethnicity						
Caucasian	37.3%[b]	62.7%[b]	37.3%[b]	62.7%[b]	43.3%	56.7%
African American	31.6%[b]	68.4%[b]	31.6%[b]	68.4%[b]	44.2%	55.8%
Gender						
Female	35.6%[b]	64.4%[b]	35.6%[b]	64.4%[b]	45.6%	54.4%
Male	32.1%[b]	67.9%[b]	32.1%[b]	67.9%[b]	36.5%	63.5%
Age Group						
Oldest Third	35.6%[b]	64.4%[b]	35.6%[b]	64.4%[b]	33.3%[b,c]	66.7%[b]
Youngest Third	37.9%[a]	62.1%[a]	37.9%[b]	62.1%[b]	51.7%[c]	48.3%

Note: a: p < .05, b: p < .01 for endorsement; c: p < .05, d: p < .01 for demographic

SAMPLE CHARACTERISTICS

	Cognitive Concerns			
	Expecting 65% to Endorse[17]		Expecting 43% to Endorse[17]	
	Yes (65%)	No (35%)	Yes (43%)	No (57%)
Ethnicity				
Caucasian	14.1%[b]	85.9%[b]	14.1%[b]	85.9%[b]
African American	14.9%[b]	85.1%[b]	14.9%[b]	85.1%[b]
Gender				
Female	14.6%[b]	85.4%[b]	14.6%[b]	85.4%[b]
Male	13.2%[b]	86.8%[b]	13.2%[b]	86.8%[b]
Age Group				
Oldest Third	12.6%[b]	87.4%[b]	12.6%[b]	87.4%[b]
Youngest Third	17.2%[b]	82.8%[b]	17.2%[b]	82.8%[b]

Note: a: p < .05, b: p < .01 for endorsement; c: p < .05, d: p < .01 for demographic

RESULTS

Full Sample: N = 259

Predictor	R^2	χ^2	*Df*	*B*	Wald	OR	OR 95% CI
Anhedonia	0.069	10.099**	2	-0.158	0.131	0.854	0.362—2.013
Low Mood				1.242	7.530**	3.462	1.426—8.405

note: CI = confidence interval. OR = odds ratio. *R2* = Nagelkerke *R2*. *p < .05. **p < .01

RESULTS

Caucasian Sample: n = 142

Predictor	R^2	χ^2	*Df*	*B*	Wald	OR	OR 95% CI
Anhedonia	0.104	8.449*	2	-0.815	1.663	0.443	0.128—1.528
Low Mood				1.839	7.711**	6.290	1.718—23.035

note: CI = confidence interval. OR = odds ratio. *R2* = Nagelkerke *R2*. *p < .05. **p < .01

RESULTS

African American Sample: n = 114

Predictor	R^2	χ^2	*Df*	*B*	Wald	OR	OR 95% CI
Anhedonia	0.059	3.904	2	0.438	0.517	1.550	0.469—5.115
Low Mood				0.784	1.599	2.190	0.650—7.383

note: CI = confidence interval. OR = odds ratio. *R2* = Nagelkerke *R2*. *$p < .05$. **$p < .01$

RESULTS

Female Sample: n = 205

Predictor	R^2	χ^2	*Df*	*B*	Wald	OR	OR 95% CI
Anhedonia	0.079	9.306*	2	-0.420	0.761	0.657	0.256—1.688
Low Mood				1.433	8.099**	4.190	1.562—11.237

note: CI = confidence interval. OR = odds ratio. *R2* = Nagelkerke *R2*. *$p < .05$. **$p < .01$

RESULTS

Male Sample: n = 53

Predictor	R^2	χ^2	*Df*	*B*	Wald	OR	OR 95% CI
Anhedonia	0.086	2.154	2	1.111	1.059	3.037	0.366—25.194
Low Mood				0.295	0.074	1.343	0.161—11.169

note: CI = confidence interval. OR = odds ratio. *R2* = Nagelkerke *R2*. *p < .05. **p < .01

RESULTS

Oldest Third of the Sample: n = 87

Predictor	R^2	χ^2	*Df*	*B*	Wald	OR	OR 95% CI
Anhedonia	0.053	2.433	2	-0.091	0.011	0.913	0.172—4.854
Low Mood				1.080	1.633	2.944	0.562—15.422

note: CI = confidence interval. OR = odds ratio. *R2* = Nagelkerke *R2*. *p < .05. **p < .01

RESULTS

Youngest Third of the Sample: n = 87

Predictor	R^2	χ^2	*Df*	*B*	Wald	OR	OR 95% CI
Anhedonia	0.069	3.698	2	-0.294	0.183	0.745	0.194—2.867
Low Mood				1.295	3.026	3.652	0.849—15.716

note: CI = confidence interval. OR = odds ratio. *R2* = Nagelkerke *R2*. *p < .05. **p < .01

DISCUSSION

- Only low mood was an unique predictor of cognitive complaints.
- In general, people endorsing low mood were 3.5 times more to have cognitive concerns identified during screening than those who denied experiencing low mood in the past two weeks.

DISCUSSION

- The odds of cognitive complaints being identified varied a bit across subsamples from the overall figure of 3.5
  - Caucasians were 6.3 times more likely
  - Females were 4.2 times as likely
  - Interestingly, African American patients, male patients, the oldest patients, and the youngest patients who reported low mood were not significantly more likely to have cognitive concerns identified than those who denied low mood
    - In fact for many patients such as these, depression was not a factor in the report of cognitive symptoms and may have been absent in their clinical presentation

DISCUSSION

- Limitations
  - Program evaluation rather than research study
  - Fatigue and anhedonia confounded
  - Exploration limited to only two symptoms of depression
  - Very low percentage of patients with cognitive concerns identified may have reduced power,
    - this issue may have been even more pronounced when dividing the sample into subsets to examine the relationship of depressive symptoms and cognitive concerns in a single demographic category (e.g., males)

DISCUSSION

- Possible implications of findings:
  - Professionals may want to give greater consideration to interventions directly elevating mood, in the treatment of depression when cognition is also of concern, than to behavioral activation and stimulation.
  - Although anhedonia was not significantly related to cognitive concerns in this limited exploration, teasing apart anhedonia from fatigue may be advisable to uncover masked effects of anhedonia versus fatigue

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