Predictors of Decisional Capacity in AD Biomarker Test Candidates

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BACKGROUND

- With advances in Alzheimer's disease (AD) research and care, more individuals have the opportunity to learn about their AD biomarker status.
- Deciding to learn one's AD biomarker status requires comprehending and deliberating about complex and nuanced information.
- Assessing capacity to consent to AD biomarker testing and disclosure is further complicated when candidates have cognitive impairment and present with family care partners

PURPOSE

To identify predictors of decisional capacity for an amyloid PET disclosure study among persons with Mild Cognitive Impairment (PwMCI) and their care partners (CPs).

METHODS

- Current investigation is a secondary analysis of the Return of Amyloid Imaging Scan Results (RAISR),[1] a longitudinal randomized controlled trial of amyloid imaging results disclosure among PwMCI and their CPs. The current analysis is a cross-sectional examination using only baseline data.
- Eighty-two dyads (N=164 total) were recruited through the University of Pittsburgh Alzheimer Disease Research Center (ADRC).
- Following an information session, participants' decisional capacity were assessed, and if they had sufficient capacity, they signed an informed consent, and baseline data were collected.
- Measures:
  - Sociodemographic data including sex, age, race/ethnicity, and level of education.
  - Decisional capacity was measured using University of California, San Diego Brief Assessment of Capacity to Consent (**UBACC**),[2] a 10-item self-report assessment of participants' ability to understand, appreciate, reason, and express their choices when considering participation in AD research study. Scores range from 0 to 20 with adequate capacity cut off at score ≥14.
  - MCI/AD **Knowledge** were measured with 11-item self-report instrument, adopted from the Risk Evaluations and Education for Alzheimer's Disease (REVEAL) study [3]; 1 point per item with 11points being the highest score. The higher the score, the better understanding of MCI, AD, and normal aging among participants.
  - **Mini Mental State Exam (**MMSE**)[4] is a 30-item paper-and-pencil test which assesses cognitive function including attention, orientation, memory, registration, recall, calculation, language, and ability to draw a complex polygon; total score ranging from 0 to 30, with scores ≤23 being classified as cognitive impairment.
  - **Animal Naming Test (**ANT(n)**)[5] is an assessment of semantic fluency and participants are asked to name as many animals as they can in one minute. Higher scores indicate better neuropsychological status, with at least 14 animal naming the cutoff point.
  - **Trail Making Test (**TMT**)[6] is an assessment of visual scanning, graphomotor speed, and executive function. Participants are scored based on the number of seconds it takes to complete the test, therefore a lower score indicates better neuropsychological status. In part A (TMT-A), the circles are numbered, and the cut off score for impairment is > 78 seconds, and in part B (TMT-B), the circles include both numbers and letters, and the cut off score is > 273 seconds.
- Descriptive statistics and multiple linear regression analyses were conducted using IBM® SPSS® Statistics (version 28).
- Dyadic analyses were conducted using Mplus (version 8). Structural equation modeling with bootstrapping was used to fit actor-partner interdependence models to examine the relations between MCI/AD knowledge and level of education with the decisional capacity for PwMCI and their CPs.

*** Measures only collected on PwMCI.*

SAMPLE CHARACTERISTICS

CHARACTERISTIC	PwMCI (n=82)	CPs (n=82)
Age (years), Mean ± SD	72.6 ± 8.8	66.8 ±12.6
Education (years), Mean ± SD	16.5 ± 2.6	15.5 ± 1.7
Male, n (%)	49 (59.8)	20 (24.4)
White, n (%)	75 (91.5)	74 (90.2)
Spouse/domestic partner, n (%)	NA	58 (70.7)
MCI/AD Knowledge, Mean ± SD	8.9 ± 1.5	8.9 ± 1.3
MMSE, Mean ± SD	27.2 ± 1.9	NA
ANT (n), Mean ± SD	17.72 ± 5.1	NA
TMT A (seconds), Mean ± SD	32.4 ± 9.5	NA
TMT B (seconds), Mean ± SD	90.3 ± 39.5	NA
UBACC, Mean ± SD	18.9 ± 1.4	19.1 ± 1.3

RESULTS

Predictors of Decisional Capacity of PwMCI (N=82)

PREDICTOR	SLOPE	STANDARD ERROR	T-VALUE	P-VALUE
Sex	-0.284	0.294	-0.968	0.336
Age	-0.037	0.019	-1.984	0.051
Race	-0.223	0.535	-0.417	0.678
Education	-0.021	0.062	-0.338	0.736
MCI/AD Knowledge	0.241	0.101	2.376	0.020
MMSE	0.215	0.082	2.605	0.011
ANT(n)	0.011	0.031	0.358	0.721
TMT-A	-0.048	0.018	-2.762	0.007
TMT-B	0.006	0.004	1.523	0.132

Among PwMCI, higher level of knowledge on MCI/AD and normal aging, higher MMSE scores, and lower TMT-A scores were significant predictors of their decisional capacity.

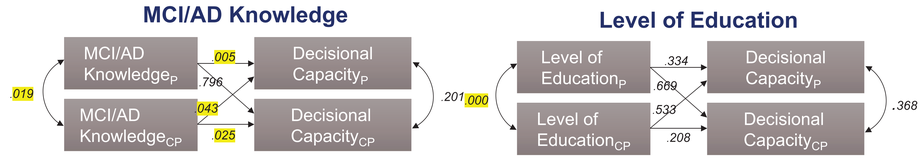
ACTOR & PARTNER CORRELATIONS (N=164)

VARIABLE	ESTIMATE	P-VALUE
MCI/AD Knowledge on Decisional Capacity		
Actor: Within PwMCI	0.328	0.005
Actor: Within Care Partner	0.262	0.025
Partner: PwMCI to Care Partner	-0.025	0.796
Partner: Care Partner to PwMCI	-0.207	0.043
Level of Education on Decisional Capacity		
Actor: Within PwMCI	0.117	0.334
Actor: Within Care Partner	0.179	0.208
Partner: PwMCI to Care Partner	-0.056	0.669
Partner: Care Partner to PwMCI	-0.072	0.533

Within the dyad, analyses revealed significant positive correlations for MCI/AD knowledge for actor relations for decisional capacity for both the PwMCI and the CPs.

Care partners' level of MCI/AD knowledge had a negative correlation for partner relations for decisional capacity.

DYADIC ANALYSES (N=82 dyads)



CONCLUSIONS

- MMSE scores, level of knowledge of MCI/AD, and TMT-A were predictors of decisional capacity for PwMCI.
- Participants' and care partner's level of MCI/AD knowledge and education were correlated to one another, and there were significant positive correlations for level of MCI/AD knowledge and decisional capacity for both PwMCI and CPs.
- Clinicians should cautiously assess for decisional capacity when recruiting PwMCI for AD research as not only do individual characteristics put PwMCI at risk for lower decisional capacity, but dyadic effects from their CPs may also be present.
- Limitations of study results include limited racial diversity and level of education among both PwMCI and CPS.

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