

Psychological Impact of Learning Brain Amyloid PET Results in Cognitively Unimpaired Older Adults in the REVEAL-SCAN Study

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Background

- Disease-modifying treatment for preclinical Alzheimer's disease (AD) may soon enter clinical practice, with trials of anti-amyloid therapies in preclinical AD underway
- Learning that one is at elevated risk for developing cognitive decline due to AD could impact psychological wellbeing
- We evaluated psychological wellbeing of older adults in Risk Evaluation in AD – Study of the Communication of Amyloid Neuroimaging (REVEAL-SCAN)

Objectives

- Understand the impact of learning one's amyloid positron emission tomography (PET) result on:
 - Depression
 - Anxiety
 - Psychological distress
 - Perception of stigma
- Explore differences in psychological impact across racial groups

Methods

- REVEAL-SCAN recruited cognitively unimpaired older adults aged 65-80 years who had a first degree relative with AD
- Participants were randomized to receive their amyloid PET result immediately or 6 months after endpoint collection (see Study Flow)
- Zero-adjusted gamma log-link regression used to evaluate impact of amyloid PET disclosure on psychological wellbeing, adjusted for age, education, AD risk, and perception of AD risk

Study flow

Screening

- Visit 1: Cognitive and psychological screening (GDS, STAI)
- Visit 2: Amyloid education, baseline cognitive and psychological assessment (GDS, STAI)

Intervention

- Visit 3: Amyloid PET
- Visit 4: Disclosure of AD risk estimate, **randomized to with (D+) or without (D-) amyloid PET result**
- 1-3 day post-disclosure safety check (IES, INI-AD)

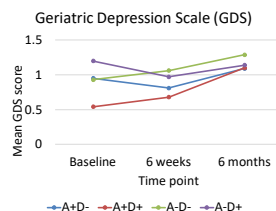
Follow up

- Visits 5 and 6: Six weeks and six months post-disclosure psychological assessment (GDS, STAI, IES, INI-AD, SIS)
- Visit 7: Delayed disclosure for D- group

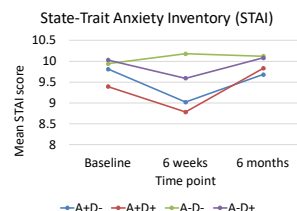
GDS: Geriatric Depression Scale; STAI: State-Trait Anxiety Inventory; IES: Impact of Events Scale; INI-AD: Impact of Neuroimaging for Alzheimer's Disease; SIS: Social Impact Scale

Results

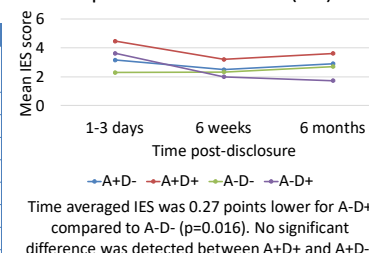
Characteristics (Total N = 295)	Amyloid Positive (A+)			Amyloid Negative (A-)		
	No disclosure (D-) (N = 43)	Disclosure (D+) (N=41)	p-value	No disclosure (D-) (N= 113)	Disclosure (D+) (N= 118)	p-value
IES – mean (SD)						
1-3 days	3.15 (4.08)	4.46 (5.26)	0.2	2.28 (3.15)	3.62 (4.08)	0.003
6 weeks	2.48 (3.46)	3.19 (4.60)	0.6	2.32 (3.32)	1.99 (3.17)	0.6
6 months	2.90 (3.57)	3.60 (5.20)	0.6	2.69 (4.59)	1.72 (3.00)	0.2
INI-AD – mean (SD)						
1-3 days	4.93 (6.15)	8.17 (9.31)	0.2	4.60 (5.35)	2.85 (3.35)	0.018
6 weeks	14.28 (7.89)	15.34 (10.68)	0.6	13.71 (7.90)	7.47 (6.47)	<0.001
6 months	14.77 (8.7)	18.05 (11.09)	0.2	16.27 (8.45)	10.09 (6.80)	<0.001
STAI – mean (SD)						
Baseline	9.81 (3.63)	9.39 (2.75)	0.8	9.94 (3.24)	10.03 (3.41)	>0.9
6 weeks	9.02 (3.01)	8.78 (2.82)	0.8	10.18 (3.79)	9.59 (3.09)	0.4
6 months	9.68 (4.03)	9.83 (3.22)	0.5	10.12 (3.43)	10.08 (3.64)	0.7
GDS – mean (SD)						
Baseline	0.95 (1.19)	0.54 (0.84)	0.053	0.93 (1.24)	1.20 (1.60)	0.3
6 weeks	0.81 (1.31)	0.68 (1.15)	0.7	1.06 (1.34)	0.97 (1.54)	0.1
6 months	1.09 (1.49)	1.10 (1.67)	>0.9	1.29 (1.60)	1.14 (1.61)	0.3
SIS – mean (SD)						
6 weeks	26.85 (6.36)	27.67 (5.89)	0.023	27.57 (7.56)	26.28 (5.11)	0.1
6 months	27.68 (6.93)	28.55 (6.54)	0.2	27.97 (6.71)	26.77 (5.84)	0.1
AD risk – mean (SD)						
Baseline	22.31 (7.57)	23.58 (8.06)	0.4	23.80 (7.67)	24.19 (6.78)	0.9
Perception of AD risk – mean (SD)						
Baseline	33.67 (19.19)	29.34 (19.07)	0.4	32.14 (17.69)	26.92 (16.41)	0.010
6 weeks	34.68 (20.77)	34 (21.68)	0.8	37.75 (23.65)	25.80 (19.50)	<0.001
6 months	41.80 (24.24)	35.55 (21.46)	0.2	38.08 (21.95)	29.35 (21.22)	<0.001



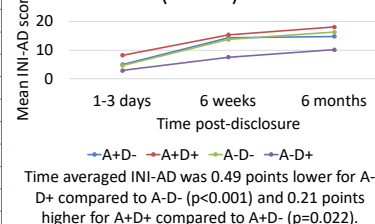
Regression models showed no significant difference in GDS or STAI scores between D+ and D- groups for A+ and A- individuals.



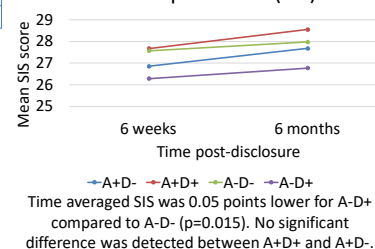
Impact of Events Scale (IES)



Impact of Neuroimaging for AD (INI-AD)



Social Impact Scale (SIS)



Subgroup analysis

	Amyloid +		Amyloid -	
	Beta (95% CI)	p-value	Beta (95% CI)	p-value
Non-Black participants (A+ N=56-60, A- N=167-176)				
IES	0.21 (-0.17, 0.59)	0.29	-0.17 (-0.40, 0.07)	0.16
INI-AD	0.22 (0.01, 0.42)	0.04	-0.53 (-0.67, -0.40)	<0.001
SIS	0.01 (-0.06, 0.09)	0.74	-0.07 (-0.12, -0.03)	<0.001
Black participants (A+ N=15-17, A- N=43-47)				
IES	-0.09 (-0.78, 0.61)	0.81	-1.01 (-1.56, -0.47)	<0.001
INI-AD	0.23 (-0.16, 0.62)	0.25	-0.34 (-0.61, -0.06)	0.02
SIS	0.08 (-0.07, 0.22)	0.30	0.03 (-0.05, 0.12)	0.45

Differences in IES for A- individuals were driven by Black participants. Non-Black A+ individuals had higher INI-AD scores, and both Black and non-Black A- individuals had lower INI-AD scores. Differences in SIS for A- individuals were driven by non-Black participants.

Conclusions

- A negative amyloid PET result is associated with reduced distress among cognitively unimpaired adults with elevated AD risk
- An elevated amyloid PET result is associated with greater distress among non-Black compared to Black individuals
- Future studies should examine ways to best support cognitively unimpaired individuals who learn their amyloid PET results.

Acknowledgements

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