

Loss Of A Loved One, Life Stress And Longitudinal Cognitive Decline In Adults With Down Syndrome



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Introduction:

- Individuals with DS are at high risk of developing Alzheimer's Disease (AD)¹
- Exposure to stress has been suggested as a risk factor for cognitive decline in the general population ^{2,3}
 - Death of a loved one suggested as a particularly potent stressor⁴
- Role of life stressors in longitudinal cognitive decline minimally investigated in adults with DS.

Methods:

- Alzheimer's Biomarkers Consortium - Down Syndrome Data Set⁵
 - participants with no Dementia or Mild Cognitive Impairment at Baseline Visit (N = 93)
- Data set includes
 - Baseline Informant "Life Stressor Index": 11 stressors in the past year and their impact (serious illness, hospitalization, a loved one's hospitalization, a loved one's death, a move, a friend moving away, a new roommate, losing/quitting a job/retiring, a new job, money problems; none, handled well, bad impact, complex impact)
 - Baseline and follow-up cognitive tests ^{6,7,8}
- Separate regressions assessed whether:
 - Death of a loved one (complex/negative impact) and Sum of stress events predicted decline in cognitive scores over time. Model 1: bivariate associations; Model 2: adjusted for age, sex, site, level of intellectual disability, and clinical latency; Model 3: adjusted for all covariates in Model 2 plus history of anxiety, depression or obsessive/compulsive disorder.

	Model 1			Model 2			Model 3		
	Est	Std. Error	P	Est	Std. Error	P	Est	Std. Error	P
DSMSE	5.92	4.18	0.16						
Block Design	-6.31	2.51	0.014	-6.74	2.64	0.013	-7.29	2.62	0.007
Cats & Dogs, naming	5.76	3.57	0.11						
Cats & Dogs, switch	0.67	4.81	0.89						
Verbal Fluency	1.26	1.20	0.30						
Cued Recall	2.33	3.10	0.45						

Table 1: Cognitive Score Change Associated with Death of a Loved One with Bad/Complex Impact
Est = estimated coefficient, DSMSE = Down Syndrome Mental Status Examination; Block Design = Block Design Cognitive Test, Cats and Dogs naming = Modified Cats and Dogs Task, naming trial; Cats and Dogs switch = Modified Cats and Dogs Task, switch trial, Cued Recall = Modified Cued Recall Test

	Model 1			Model 2			Model 3		
	Est	Std. Error	P	Est	Std. Error	P	Est	Std. Error	P
DSMSE	-2.38	1.84	.20						
Block Design	-1.76	1.14	0.84						
Cats & Dogs, naming	0.80	0.57	0.17						
Cats & Dogs, switch	-0.39	0.82	0.64						
Verbal Fluency	-0.59	0.21	0.012	-0.49	0.23	0.040	-0.46	0.26	0.08
Cued Recall	-0.46	0.53	0.38						

Table 2: Cognitive Score Change Associated with Sum of Stress Events
Est = estimated coefficient, DSMSE = Down Syndrome Mental Status Examination; Block Design = Block Design Cognitive Test, Cats and Dogs naming = Modified Cats and Dogs Task, naming trial; Cats and Dogs switch = Modified Cats and Dogs Task, switch trial, Cued Recall = Modified Cued Recall Test

Results:

- Mean age of 48.4 years at baseline, 42% female, 56% classified as mild and 41% classified as moderate intellectual disability
- Baseline loss of a loved one with a negative/ complex impact was associated with a 7-point greater decline in Block Design (p = 0.007).
- Higher number of baseline life stressors was associated with a 0.5-point greater decline in verbal fluency (p = 0.040), however, this association was no longer significant after further adjustment for depression/ anxiety and obsessive-compulsive disorder.
- No significant associations were observed for other cognitive measures.

Conclusions

Life stressors may contribute to subsequent cognitive decline in adults with DS and warrant further investigation.

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Financial Disclosure:

ABC-DS is funded by the NIH- NIA (U19AG068054).
LMF is supported by the NIH- NIA (K99AG082864).
All authors declare no conflict of interest.
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