Published in final edited form as:

J Am Geriatr Soc. 2014 January ; 62(1): 197–199. doi:10.1111/jgs.12628.

DEPRESSIVE SYMPTOMS AND MILD COGNITIVE IMPAIRMENT: RESULTS FROM THE KERALA-EINSTEIN STUDY

Vijayaleskhmi Nair, MBBS,

Department of Neurology, Albert Einstein College of Medicine, Bronx, New York

Emmeline Ayers, MPH,

Department of Neurology, Albert Einstein College of Medicine, Bronx, New York

Mohan Noone, DM,

Department of Neurology, Baby Memorial Hospital Kozhikode, India

Beena Johnson, MBBS, and

Department of Neurology, Baby Memorial Hospital Kozhikode, India

Joe Verghese, MBBS

Department of Neurology, Department of Medicine Albert Einstein College of Medicine, Bronx, New York

To the Editor

Depression is a frequent comorbid condition in individuals with mild cognitive impairment (MCI), a state that puts one at high risk for dementia. Depression in individuals with MCI is associated with risk of conversion to dementia¹ and serious consequences for individuals, including impairment in activities of daily living, rapid cognitive decline, worsening quality of life, and institutionalization.¹

Prevalence of dementia is estimated to be higher² than previously reported³ in lower-middle-income countries such as India. Data on the coexistence of major geriatric syndromes such as depression and dementia is lacking.² Thus, the goal of this preliminary study was to evaluate associations between depression and MCI in older adults in Kerala, India.

METHODS

The goal of the Kerala-Einstein Study (KES) is to identify risk factors for cognitive decline in older adults in Kerala.⁴ Participants were prospectively recruited from neurology clinics at the Baby Memorial Hospital, Kozhikode, between September 2008 and March 2012.⁴ Referral reasons were cognitive complaints or other neurological symptoms including

Author Contributions: Nair, Ayers, Verghese: study concept, data acquisition, data analysis, data interpretation, drafting manuscript. Noone, Johnson: study design, data acquisition, data interpretation, drafting manuscript.

Conflict of Interest: Drs. Noone, Johnson, and Verghese have received research support from National Institutes of Health (NIH) Grants 1R21 AG025119 and 1R01 AG039330–01. Dr. Verghese has reviewed for NIH and received funding from National Institute on Aging Grants PO1 AG03949 and R01AG036921–01A1.

headache, stroke, or neuropathy. Cognitively normal controls were recruited from participant relatives or individuals attending the clinic for noncognitive symptoms.⁴ Inclusion criteria were aged 60 and older and willingness to complete study procedures.⁴ Exclusion criteria were severe audiovisual loss and medical, neurological, or psychiatric illness that would interfere with completion of study procedures.⁴

Subjects received detailed evaluations for general cognitive status and specific cognitive domains, including memory, attention, executive function, and language,⁴ using standard neuropsychological tests in the local language (Malayalam). Mood was assessed using the 15-item Geriatric Depression Scale (GDS).⁵ GDS scores of 10 or greater were categorized as major depressive symptoms, which is highly correlated with a clinical diagnosis of major depression.⁶ Social networks were assessed using a five-item version of the Social Network Index (SNI).⁷ Correlations between the short (range 0–5) and full (range 0–12)⁷ versions of the SNI were excellent (correlation coefficient = 0.926, $P < .001$) in an independent sample of 644 participants evaluated at another KES site.²

MCI was diagnosed in individuals without dementia with cognitive complaints and objective cognitive impairment (≥ 1.5 standard deviations below age- and sex-appropriate means) at consensus diagnostic conferences that two or more study clinicians attended.⁴

Characteristics of participants with MCI and controls were compared. Logistic regression analysis was used to assess associations between GDS, SNI, and MCI adjusted for age, sex, education, and prescription medication count. Variables included in the models were identified in bivariate analyses and prior studies.^{1,8} The effects of SNI on associations between depressive symptoms and MCI were evaluated using interaction terms.

RESULTS

Three hundred ninety-three participants were recruited over a 4-year study period. After excluding 62 participants with dementia and 62 with incomplete GDS ($n = 9$) or SNI ($n = 53$), 269 adults without dementia aged 60 to 84 were eligible for analysis. Of the 269 participants (mean age 67.1, 42% female), 31 were diagnosed with MCI.

Table 1 illustrates cohort characteristics according to MCI status. Individuals with MCI were older than controls (mean age 70.5 vs 66.7) and had significantly different GDS ($P = .008$) and SNI ($P = .002$) scores. Six of the 30 participants with GDS scores of 10 or greater (20%) had MCI. Seventeen of these 30 participants were clinically diagnosed with depression, including four of the six participants with MCI.

There was a significant association between high GDS (≥ 10) scores and MCI diagnosis (odds ratio (OR) = 1.15, 95% confidence interval (CI) = 1.03–1.29). SNI was inversely associated with MCI (OR = 0.62, 95% CI = 0.44–0.86). No interaction was found between GDS and SNI scores ($P = .16$).

DISCUSSION

Major depressive symptoms were associated with a 15% greater prevalence of MCI (OR = 1.15) in this clinic-based population. Of participants with a clinical diagnosis of depression, only 33% of the MCI group was prescribed antidepressants and none of those without MCI. Successful treatment of depression was reported to improve cognitive functioning in elderly adults with depression with cognitive impairment, highlighting the importance of identifying depression especially in individuals with MCI.⁹ Undertreatment of depression in the current study cohort could reflect under-recognition of depression due to local socio-cultural misconceptions or economic reasons.

High SNI was associated with lower risk of MCI in this cohort, consistent with the lower risk of dementia reported in older persons with larger social networks.¹⁰ Social networks have the potential to moderate depressive symptoms in individuals with MCI. The SNI, which assessed quantity but not quality of social interactions, may explain the lack of significant interaction between SNI and depression in participants with MCI in this study.

This study highlights the prevalence and undertreatment of depressive symptoms in older Indians with and without MCI. Results indicate the need for better cognition and depression screening tools in developing countries. Further research is essential to elucidate the role of social networks in the context of the depression–MCI axis.

Acknowledgments

Sponsor's Role: The funding sources had no role in the design or conduct of the study; collection, management, analysis, or interpretation of the data; or preparation, review, or approval of the manuscript.

References

1. Lyketsos CG, Lopez O, Jones B, et al. Prevalence of neuropsychiatric symptoms in dementia and mild cognitive impairment. *JAMA*. 2002; 288:1475–1483. [PubMed: 12243634]
2. Mathuranath P, George A, Ranjith N, et al. Incidence of Alzheimer's disease in India: A 10 years follow-up study. *Neurol India*. 2012; 60:625. [PubMed: 23287326]
3. Kalaria RN, Maestre GE, Arizaga R, et al. Alzheimer's disease and vascular dementia in developing countries: Prevalence, management, and risk factors. *Lancet Neurol*. 2008; 7:812–826. [PubMed: 18667359]
4. Verghese J, Noone ML, Johnson B, et al. Picture-based memory impairment screen for dementia. *J Am Geriatr Soc*. 2012; 60:2116–2120. [PubMed: 23039180]
5. Yesavage, J.; Brink, T.; Rose, T. *Handbook of Psychiatric Measures*. Washington, DC: American Psychiatric Association; 2000. Geriatric Depression Scale (GDS).
6. Almeida OP, Almeida SA. Short versions of the Geriatric Depression Scale: A study of their validity for the diagnosis of a major depressive episode according to ICD-10 and DSM-IV. *Int J Geriatr Psychiatry*. 1999; 14:858–865. [PubMed: 10521885]
7. Cohen S, Doyle WJ, Turner R, et al. Sociability and susceptibility to the common cold. *Psychol Sci*. 2003; 14:389–395. [PubMed: 12930466]
8. Richard E, Reitz C, Honig LH, et al. Late-life depression, mild cognitive impairment, and dementia. *JAMA Neurol*. 2013; 70:383–389.
9. Butters MA, Becker JT, Nebes RD, et al. Changes in cognitive functioning following treatment of late-life depression. *Am J Psychiatry*. 2000; 157:1949–1954. [PubMed: 11097959]

10. Fratiglioni L, Paillard-Borg S, Winblad B. An active and socially integrated lifestyle in late life might protect against dementia. *Lancet Neurol.* 2004; 3:343–353. [PubMed: 15157849]

Table 1

Sample Characteristics According to Mild Cognitive Impairment (MCI) Status

Variable	Total Sample	Normal Cognition, n = 238	MCI, n = 31	P-Value
Age, mean $\pm$ SD	67.1 $\pm$ 5.2	66.7 $\pm$ 5.1	70.5 $\pm$ 5.7	<.001
Female, n (%)	114 (42)	101 (42)	13 (42)	.96
Education, years, mean $\pm$ SD	8.5 $\pm$ 3.6	8.9 $\pm$ 3.6	5.9 $\pm$ 3.3	<.001
Number of medications, mean $\pm$ SD	1.5 $\pm$ 1.7	1.5 $\pm$ 1.7	2.0 $\pm$ 1.0	.09
Number of medications for depression, mean $\pm$ SD	0.1 $\pm$ 0.2	0.0 $\pm$ 0.1	0.2 $\pm$ 0.4	<.001
Social Network score, mean $\pm$ SD (range 0–5)	4.7 $\pm$ 0.8	4.8 $\pm$ 0.7	4.3 $\pm$ 1.4	.002
GDS score, mean $\pm$ SD (range 0–15)	4.8 $\pm$ 3.3	4.6 $\pm$ 3.3	6.3 $\pm$ 3.3	.008
Depressed (>10 on GDS), n (%)	30 (11)	24 (10)	6 (19)	.12

SD = Standard Deviation; GDS = Geriatric Depression Scale.