Published in final edited form as:
Aging Ment Health. 2012 ; 16(3): 372–377. doi:10.1080/13607863.2011.609533.

Race and Cognitive Decline among Community-dwelling Elders with Mild Cognitive Impairment: Findings from the Memory and Medical Care Study

Hochang B. Lee, M.D.[1,4], **Amanda K. Richardson, Ph.D.**[2], **Betty S. Black, Ph.D.**[1,2,3], **Andrew D. Shore, Ph.D.**[3], **Judith D. Kasper, Ph.D.**[3], and **Peter V. Rabins, M.D., M.H.S.**[1,3,4]

[1]Department of Psychiatry & Behavioral Sciences, School of Medicine, Johns Hopkins University, Baltimore, Maryland [2]Department of Health, Society & Behavior, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland [3]Department of Health Policy and Management, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland [4]Department of Mental Health, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland

Abstract

Objective—Previous studies have reported conflicting findings on relationship between race and cognitive decline in elders with dementia. Few studies have examined the role of race in cognitive decline in mild cognitive impairment (MCI). We investigate the relationship between race and cognitive decline in participants with mild cognitive impairment (MCI) in a community-based, longitudinal study of cognitively impaired elders.

Method—Based on a validated method utilizing a neuropsychiatric battery, 133 subjects [mean age: 78.7 years (SD =6.5); female: 112 (76.7%); black: 59 (44.4%)] out of 512 participants in the Memory and Medical Care Study (MMCS) were diagnosed with MCI. The main outcome measure was the Telephone Interview for Cognitive Status (TICS) score over three years. Other baseline subject characteristics (demographics, health-related variables, behavioral and psychiatric symptoms) were included in the analysis.

Results—Overall, the three-year decline in mean TICS score was significantly higher among African Americans than non-African Americans [3.31 (SD: 7.5) versus 0.96 (SD: 3.0), t-value = 1.96, p-value = 0.05]. General estimating equation analyses revealed that African American race was associated with a faster rate of cognitive decline in all models.

Conlusion—The rate of cognitive decline in MCI appears to be faster in African Americans than non-African Americans in the community. Diagnosis of MCI among African-American elders could lead to early interventions to prevent or delay cognitive decline in the future.

Keywords

Race; Mild Cognitive Impairment; Dementia; Cognitive Decline; African-American

Address correspondence to: Hochang Benjamin Lee, M.D., The Johns Hopkins University School of Medicine, 5300 Alpha Commons Drive, 4th Floor, Baltimore, MD 21224. Hochang@jhmi.edu, Contact phone: (410) 550-2282.

Introduction

When compared to Caucasians, African Americans have a higher incidence of chronic diseases, shorter life expectancy, and poorer health outcomes (Fiscella, Franks, Gold & Clancy, 2000). This racial disparity extends to cognitive functioning as well, as several population-based comparative studies have revealed higher rates of dementia among African Americans than Caucasian community dwelling elders (Schwartz et al., 2004; Zsembik & Peek, 2001; Heyman et al., 1991; Folstein, Bassett, Anthony, Romanoski & Nestadt, 1991; Schoenberg, Anderson & Haerer, 1985). Since racial disparity in access to and quality of geriatric mental health services is pervasive in the U.S., understanding the role of race in cognitive decline is critical in delivering health services to screen and treat cognitive impairment in the community (Kales et al., 2000).

Previous studies reported inconsistent findings on the relationship between race and rate of cognitive decline and suggested that the role of race in cognitive decline might differ across the level of cognitive impairment. A few community-based studies reported faster decline in cognitive functioning among community-dwelling African American elders in Durham, NC (Sachs-Ericsson & Blazer, 2005) and in Florida (Masel & Peek, 2009), and higher incidence rate for Alzheimer's disease (AD) among African American elders compared to Caucasian elders in northern Manhattan (Tang et al, 2001). Other studies, limiting their sample to patients with AD in specialty treatment centers, have reported a slower rate of cognitive decline among African Americans (Barnes et al., 2005; Barnes, Wilson, Li, Gilley, Bennett, & Evans, 2006) and longer survival compared to Caucasians with AD (Mehta et al., 2008). However, these studies were not population-based and the inherent selection bias limited their generalizability.

The 2001 report from the Quality Standards Subcommittee of the American Academy of Neurology recommends that patients with mild cognitive impairment (MCI), a transitional state between the cognitive changes of aging and early dementia, should be identified and monitored “due to their increased risk for subsequent dementia” (Petersen, Stevens, Ganguli, Tangalos, Cummings & DeKosky, 2001). As far as we know, only one previous study has examined the potential role of race/ethnicity among community dwelling elders with MCI and reported that Hispanic elders were at higher risk for development of AD than non-Hispanic white or African American elders (Manly et al, 2008). In this analysis, we hypothesized that African Americans with MCI would have a faster rate of cognitive decline than non-African Americans and examined the impact of African American race on cognitive decline in community dwelling residents using data from a longitudinal study of a cohort of elderly persons with neuropsychologically defined MCI.

Methods

Sample

The Memory and Medical Care Study (MMCS) conducted at the Johns Hopkins Medical Institutions is a prospective observational cohort study that examines variations in the practice of caring for cognitively impaired elders living in the community (Black et al., 2003). The protocol for the MMCS was approved by the Committee on Human Research, the institutional review board for the Johns Hopkins Bloomberg School of Public Health. The MMCS identified subjects from three previously established, community-based study samples conducted in Maryland (Black et al., 2003). Among the 1,802 elderly subjects (age 65 or older) from these studies, 724 persons had Mini-Mental State Examination (MMSE) (Folstein, Folstein & McHugh, 1975) scores less than 24, or a decline of 4 or more points over two administrations that ranged from 2 to 11.5 years in the previous studies, and were living in the community at the start of the MMCS. Each of the 512 subjects (71%) who

consented to enrollment in the MMCS identified an individual who helped them most often with daily activities and was most knowledgeable about the subject's health status. These individuals also were asked to participate in the study and are referred to as the subject's knowledgeable informant (KI). Overall, KIs were spouses (18.3%), adult children (45.0%), siblings (6.4%), other relatives (18.1%) or non-relatives (12.3%) and lived with or in the same geographic area as the subject. KIs completed a baseline interview and three subsequent annual follow-up interviews, which consisted of the collection of demographics, general health information, and health service utilization information on the subject. In addition, the KI rated the subject's behavioral and psychiatric symptoms based on the depression subscale of the Neuropsychiatric Inventory (NPI) (Cummings et al., 1994), and the agitation and psychosis subscales of the Behavior Symptom Rating Scale (BSRS) (Rabins, 1994). Medicare records for each subject were available to corroborate data gathered from the KI. In the event of a discrepancy between the Medicare records and the KI report, the Medicare records were preferentially used.

Assessment and Categorization of Cognitive Impairment

All subjects were assessed to determine their cognitive status based on a validated diagnostic method using a battery of four neuropsychological tests (Boston Naming Test, Word List Memory Test, Verbal Fluency Test, and the digit symbol subset of the Wechsler Adult Intelligence Scale-Revised) (Black et al., 2003). Out of 512 subjects, 498 subjects were classified as either having no cognitive disorder (NCD, N=16), mild cognitive impairment (MCI, N=133) or dementia (DEM, N=349). Subjects not meeting criteria for dementia and scoring either: 1) at or below 1.5 SD from the mean for normal subjects of comparable age and education on any one of the four tests, or 2) at or below 1.0 SD from the mean for normal subjects of comparable age and education on at least two of the four tests were said to have MCI. For the 133 subjects classified with MCI that comprised this study sample, we sub-categorized them as amnestic MCI (aMCI) for those who scored below 1.0 SD from the mean for normal subjects of comparable age and education on the Word List Test and non-amnestic (naMCI) as those who had a normal score (within 1.0 SD from or higher than the mean) on the Word List Test.

Outcome Measures

Our primary outcome measure was cognitive decline as measured annually by the Telephone Interview for Cognitive Status (TICS) over a period of three years. The TICS was modeled on the MMSE. Brandt et al. reported a correlation of 0.94 between TICS and MMSE scores and a high test–retest reliability for the TICS (r=0.97) (Brandt, Spencer & Folstein, 1988).

The main independent variable was race (dichotomous: African American = 0, non-African American = 1). To determine race, the KI for each participant was asked, “Which of the following best describes the participant's race? Is (he/she)… white, black, Asian or something else (specify)?” Other variables investigated were: 1) age at initial interview; 2) gender (dichotomous: male = 0, female = 1); 3) marital status (dichotomous: married = 0, not married = 1); 4) education (continuous; years of school); 5) general physical health rating (ordinal: rated by KI as excellent, very good, good, fair, or poor); 6) heart disease (dichotomous: absence = 0, presence = 1 based on whether one or more of the following diagnoses was present: aortic aneurysm, arrhythmia, coronary artery disease, congestive heart failure, or valvular disease); 7) cancer; 8) stroke; 9) diabetes; 10) chronic obstructive pulmonary disease or asthma; 11) general mental health rating (ordinal: rated by KI as excellent, very good, good, fair, or poor); 12) NPI-depression rating (continuous; as rated by KI); 13) BSRS psychosis and agitation rating (continuous; as rated by KI).

Analysis

In addition to chi-square and *t*-test group comparisons with two-tailed significance at 0.05, we constructed a series of multiple regression models. These regression analyses used generalized estimating equation (GEE) marginal modeling (Liang & Zeger, 1986). This analytic method allowed us to model exposure using all data available from baseline (n = 133) to the three-year follow-up (n = 105) and to capture time-dependent covariates that could influence cognitive change. Finally, this marginal modeling approach allowed us to examine simultaneously and independently the cross-sectional and longitudinal associations between race and TICS scores.

Results

Table 1 displays the baseline characteristics and TICS scores of the 133 participants with MCI by race. The study sample included 59 African Americans (44.4%), 68 Caucasian (51.1%), and 6 others (5.4%). Over the three year follow-up, 11 African Americans (18.6%) and 17 non – African Americans (22.9%) with MCI were lost to follow-up, and there was racial disparity neither in mortality nor in attrition (chi-square test, p = 0.49). Lower age, NPI depression and BSRS ratings were associated with African American race, but there were no other significant differences in demographic and clinical variables, including the proportion of the MCI subtypes.

Overall, the three-year decline in mean TICS score was greater among African Americans with MCI than non-African Americans [3.31 (SD: 7.5) versus 0.96 (SD: 3.0), t-value = 1.96, p-value = 0.05]. General estimating equation analyses (Table 2) revealed that African American race was associated with a faster rate of cognitive decline over time in all models. Increasing age, lower education and higher scores on the BSRS were also significantly associated with cognitive decline. Other measures of mental health and physical health ratings were not significant factors.

Discussion

Our study results suggest that community-dwelling African American elders with MCI may be at risk for increased cognitive decline over time. This finding is consistent with previous reports of faster cognitive decline among African American elders in the community (Sachs-Ericsson & Blazer, 2005, Masel & Peek, 2009) and further focuses the findings on community-dwelling elders with MCI diagnosis based on a validated battery of neuropsychological tests.

Previous longitudinal studies of individuals initially classified as MCI have found some degree of reversion to normal cognition over time (Ganguli, Dodge, Shen & DeKosky, 2004; Tuokko et al., 2003; Unverzagt et al., 2001). The slight increase in the mean TICS scores from Year 2 and Year 3 in both groups (Table 1) are likely due to the retention of the MCI subjects who revert to normal cognition and the attrition of those who convert to dementia during the follow-up. The higher variance in the mean TICS scores among African Americans in comparison to non-African Americans is consistent with previous reports of greater variability in neuropsychological testing scores and false positive rates for dementia diagnosis for African Americans (Gurland, Wilder, Cross, Teresi, & Barrett, 1992).

The reasons for the apparent racial disparity in cognitive decline in MCI are unclear. The etiology, course and severity of MCI may differ across the races as in dementia (Froehlich, Bogardus, Jr. & Inouye, 2001). Differences across levels of unmeasured environmental factors that may influence cognitive functioning, such as diet, sleep and substance use, could contribute to this apparent disparity. Decreased health service utilization among African

Americans for co-morbid medical conditions has been described previously (Fiscella, Franks, Gold & Clancy, 2000), and poorer health care for African American elders with MCI may have led to faster cognitive decline.

Based on our community-based sample of dementia subjects, we also sought to replicate previous reports of the slower cognitive decline (Barnes et al., 2005; Barnes, Wilson, Li, Gilley, Bennett, & Evans, 2006) and longer survival (Mehta et al., 2008) among African Americans with dementia compared to non-African Americans. However, the high three-year mortality (nearly 40%) among dementia subjects in our sample rendered such analysis impractical, and no survival advantage among African Americans with dementia was evidenced in our previous analysis (Lee et al., 2006). A longitudinal community-based study of a larger sample of elders with early stage AD could resolve the issue of differential rate of cognitive decline in AD across racial groups.

Several methodological issues limit the generalizability of this study. First, while the TICS offers a cost-effective and reliable way of assessing cognitive performance, mixed findings have been reported over the utility of the TICS among subjects with MCI. Recent studies have reported that the TICS performed only fairly in separating MCI from normal cognition or dementia (Knopman et al, 2010, Manly et al, 2011) while another study reported high sensitivity of the TICS in distinguishing MCI from normal cognition (Cook et al, 2009). Furthermore, accuracy of the TICS among African Americans has been questioned previously (Kiddoe, Whitfield, Andel, & Edwards, 2008). Second, due to the small sample size, we could not carefully characterize and examine the role of African American race in cognitive decline across various subtypes of MCI. A recent study reported that non-amnestic MCI was substantially more common than amnestic MCI among African American elders and may be an important early indicator of cognitive impairment (Gamaldo et al., 2010). Third, in studies containing a larger sample size, the health-related variables may become more significant predictors of cognitive decline and that may influence the results. Racial differences in co-morbid medical conditions among dementia patients have been reported (Zamrini, Parrish, Parsons & Harrell, 2004). Fourth, while our community-based study lacks referral bias, participants were selected from specific communities, and the results may not be representative of all elderly persons in the U.S.

Despite these limitations, this study suggests that African Americans with MCI in the community are at higher risk for cognitive decline than non-African Americans and underscores the need for cognitive assessment and follow-up, especially for African American elders in the community. A recent survey among 420 members of the American Academy of Neurology found that clinicians generally found the MCI concept a useful diagnostic tool to inform treatment, education, and advance planning with patients and families and motivate them to dementia risk reduction activities (Roberts et al., 2010). Being at higher risk for cognitive decline than other racial groups, African American elders with MCI and their affected family could potentially benefit more from education and support than elders in other racial groups. However, previous studies revealed that African American patients with AD have more severe cognitive impairment at the time of diagnosis (Shadlen, Larson, Gibbons, McCormick & Teri, 1999), and are less likely to be treated with acetylcholinesterase inhibitors (Mehta, Yin, Resendez & Yaffe, 2005). As researchers develop more effective prevention and treatment strategies for AD, understanding and abridging the racial disparity in screening and assessment, longitudinal course, and treatment of late life cognitive disorders are critical issues for African American elders with cognitive impairment in our community.

Acknowledgments

This research was supported by grants R01 MH156412 (Rabins) and K23 MH068793 (Lee) from the National Institute of Mental Health and the National Institute on Aging.

References

Barnes LL, Wilson RS, Li Y, Aggarwal NT, Gilley DW, McCann JJ, Evans DA. Racial differences in the progression of cognitive decline in Alzheimer disease. American Journal of Geriatric Psychiatry. 2005; 13:959–967. [PubMed: 16286439]

Barnes LL, Wilson RS, Li Y, Gilley DW, Bennett DA, Evans DA. Changes in cognitive function in Alzheimer's disease in African-American and white persons. Neuroepidemiology. 2006; 26:16–22. [PubMed: 16254449]

Black BS, Kasper J, Brandt J, Shore AD, German P, Burton L, Gallo J, Lyketsos C, Rabins PV. Identifying dementia in high-risk community samples: The memory and medical care study. Alzheimer Disease and Associated Disorders. 2003; 17:9–18. [PubMed: 12621315]

Brandt J, Spencer M, Folstein M. The telephone interview for cognitive status. Neuropsychology and Behavioral Neurology. 1988; 1:111–117.

Cook SE, Marsiske M, McCoy KJM. The Use of the Modified Telephone Interview for Cognitive Status (TICS-M) in the Detection of Amnestic Mild Cognitive Impairment. J Geriatr Psychiatry Neurol. 2009; 22:103–109. [PubMed: 19417219]

Cummings JL, Mega M, Gray K, Rosenberg-Thompson S, Carusi DA, Gornbein A. The neuropsychiatric inventory: Comprehensive assessment of psychopathology in dementia. Neurology. 1994; 44:2308–2314. [PubMed: 7991117]

Fiscella K, Franks P, Gold MR, Clancy CM. Inequality in quality: Addressing socioeconomic, racial, and ethnic disparities in health care. Journal of the American Medical Association. 2000; 283:2579–2584. [PubMed: 10815125]

Folstein MF, Bassett SS, Anthony JC, Romanoski AJ, Nestadt GR. Dementia: Case ascertainment in a community survey. Journal of Gerontology. 1991; 46:M132–138. [PubMed: 2071834]

Folstein MF, Folstein SE, McHugh PR. Mini-mental state: A practical method of grading the cognitive state of patients for the clinician. Journal of Psychiatric Research. 1975; 12:189–198. [PubMed: 1202204]

Froehlich TE, Bogardus ST Jr, Inouye SK. Dementia and race: Are there differences between African-Americans and Caucasians? Journal of the American Geriatric Society. 2001; 49:477–484.

Gamaldo AA, Allaire JC, Sims RC, Whitfield KE. Assessing mild cognitive impairment among older African Americans. International Journal of Geriatric Psychiatry. 2010; 25:748–755. [PubMed: 20069588]

Ganguli M, Dodge HH, Shen C, Dekosky ST. Mild cognitive impairment, amnestic type: an epidemiologic study. Neurology. 2004; 63:115–121. [PubMed: 15249620]

Gurland B, Wilder D, Cross P, Teresi J, Barrett V. Screening scales for dementia: Toward reconciliation of conflicting cross-cultural findings. International Journal of Geriatric Psychiatry. 1992; 7:105–113.

Heyman A, Fillenbaum G, Prosnitz B, Raiford K, Burchett B, Clark C. Estimated prevalence of dementia among elderly black and white community residents. Archives of Neurology. 1991; 48:594–598. [PubMed: 2039381]

Jennifer J, Manly JJ, Schupf N, Stern Y, Brickman AM, Tang MX, Mayeux R. Telephone-based identification of MCI and dementia in a multicultural cohort. Arch Neurol. 2011 Author manuscript; available in PMC 2011 May 26. PMCID: PMC3102767.

Kales HC, Blow FC, Bingham CR, Roberts JS, Copeland LA, Mellow AM. Race, psychiatric diagnosis, and mental health care utilization in older patients. American Journal of Geriatric Psychiatry. 2000; 8:301–309. [PubMed: 11069270]

Kiddoe JM, Whitfield KE, Andel R, Edwards CL. Evaluating brief cognitive impairment screening instruments among African Americans. Aging & Mental Health. 2008; 12:488–93. [PubMed: 18791896]

Knopman DS, Rosebud O, Roberts YE, Genda V, Pankratz S, Christianson TJH, Petersen RC, Rocca WA. Validation of the Telephone Interview for Cogntiive Statuts-modified in Subjects with Normal Cgontion, Mild Cognitive Impairment, or Dementia. Neuroepidemiology. 2010; 34:34–42. [PubMed: 19893327]

Lee HB, Kasper JD, Shore AD, Yokley JL, Black BS, Rabins PV. Level of cognitive impairment predicts mortality in high-risk community samples: The memory and medical care study. The Journal of Neuropsychiatry and Clinical Neurosciences. 2006; 18:543–546. [PubMed: 17135381]

Liang K, Zeger SL. Longitudinal data analysis using generalized linear models. Biometrika. 1986; 73:13–22.

Manly JJ, Tang MX, Schupf N, Stern Y, Vonsattel JG, Mayeux R. Frequency and course of mild cognitive impairment in a multiethnic community. Annals of Neurology. 2008; 63:494–506. [PubMed: 18300306]

Manly JJ, Schupf N, Stern Y, Brickman AM, Tang MX, Mayeux R. Telephone-based identification of mild cognitive impairment and dementia in a multicultural cohort. Arch Neurol. 2011; 68(5):607–614. [PubMed: 21555635]

Masel MC, Peek MK. Ethnic differences in cognitive function over time. Annals of Epidemiology. 2009; 19:778–783. [PubMed: 19656690]

Mehta KM, Yaffe K, Perez-Stable EJ, Stewart A, Barnes D, Kurland BF, Miller B. Race/ethnic differences in AD survival in US Alzheimer's Disease Centers. Neurology. 2008; 70:1163–1170. [PubMed: 18003939]

Mehta KM, Yin M, Resendez C, Yaffe K. Ethnic differences in acetylcholinesterase inhibitor use for Alzheimer disease. Neurology. 2005; 65:159–162. [PubMed: 16009909]

Petersen RC, Stevens JC, Ganguli M, Tangalos EG, Cummings JL, DeKosky ST. Practice parameter: Early detection of dementia: Mild cognitive impairment (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology. 2001; 56:1133–1142. [PubMed: 11342677]

Rabins PV. The validity of caregiver-rated brief behavior symptom rating scale (BSRS) for use in the cognitively impaired. International Journal of Geriatric Psychiatry. 1994; 9:205–210.

Roberts JS, Karlawish JH, Uhlmann WR, Petersen RC, Green RC. Mild cognitive impairment in clinical care: a survey of American Academy of Neurology members. Neurology. 2010; 75:425–31. [PubMed: 20679636]

Sachs-Ericsson N, Blazer DG. Racial differences in cognitive decline in a sample of community-dwelling older adults: The mediating role of education and history. American Journal of Geriatric Psychiatry. 2005; 13:968–975. [PubMed: 16286440]

Schoenberg BS, Anderson DW, Haerer AF. Severe dementia, prevalence, and clinical features in a biracial US population. Archives of Neurology. 1985; 42:740–743. [PubMed: 4026605]

Schwartz B, Glass T, Bolla K, Stewart WF, Glass G, Rasmussen M, et al. Bandeen–Roche K. Disparities in cognitive functioning by race/ethnicity in the Baltimore Memory Study. Environmental Health Perspectives. 2004; 112:314–320. [PubMed: 14998746]

Shadlen MF, Larson EB, Gibbons L, McCormick WC, Teri L. Alzheimer's disease symptom severity in blacks and whites. Journal of the American Geriatrics Society. 1999; 47:482–486. [PubMed: 10203126]

Tang MX, Cross P, Andrews H, Jacobs DM, Small S, Bell K, et al. Mayeux R. Incidence of AD in African-Americans, Caribbean Hispanics, and Caucasians in northern Manhattan. Neurology. 2001; 56:49–56. [PubMed: 11148235]

Tuokko H, Frerichs R, Graham J, Rockwood K, Kristjansson B, Fisk J, et al. McDowell I. Five-year follow-up of cognitive impairment with no dementia. Archives of Neurology. 2003; 60:577–582. [PubMed: 12707072]

Unverzagt FW, Gao S, Baiyewu O, Ogunniyi AO, Gureje O, Perkins A, et al. Hendrie HC. Prevalence of cognitive impairment: Data from the Indianapolis Study of Health and Aging. Neurology. 2001; 57:1655–1662. [PubMed: 11706107]

Zamrini E, Parrish JA, Parsons D, Harrell LE. Medical comorbidity in black and white patients with Alzheimer's disease. Southern Medical Journal. 2004; 97:2–6. [PubMed: 14746413]

Zsembik BA, Peek MK. Race differences in cognitive functioning among older adults. The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences. 2001; 56:S266–274.

Table 1
Baseline Characteristics and TICS Scores of Participants with MCI by Race

	African American (n=59)	Non-African American (n=74)
	Mean (SD)	***Mean (SD)***
Age, yrs	77.2 (6.3) *	79.9 (6.5) *
Education, yrs	7.3 (2.6)	8.2 (3.2)
Baseline Scores		
MMSE	23.7 (3.3)	24.4 (2.9)
Depression Subscale of NPI	0.31 (0.8) *	0.92 (1.9) *
Behavioral Symptom Rating Scale	0.40 (0.7) **	1.1 (1.4) **
	N(%)	***N(%)***
Gender-female	46 (78.0)	56 (75.7)
Marital Status- married	36 (64.3)	40 (58.0)
MCI Subtypes		
Amnestic MCI	31 (52.5)	49 (66.1)
Non-Amnestic MCI	28 (47.5)	25 (33.8)
Physical Health		
Excellent	4 (6.9)	4 (5.9)
Very good	11 (19.0)	16 (23.5)
Good	20 (34.5)	23 (33.8)
Fair	20 (34.5)	20 (29.4)
Poor	3 (5.2)	5 (7.4)
Mental Health		
Excellent	12 (21.1)	10 (14.9)
Very good	20 (35.1)	24 (35.8)
Good	17 (29.8)	22 (32.8)
Fair	7 (12.3)	8 (11.9)
Poor	1 (1.8)	3 (4.5)
Heart Disease	24 (40.7)	36 (48.6)
Diabetes	21 (35.6)	19 (25.7)
Stroke	15 (25.4)	19 (25.7)
COPD	9 (15.3)	18 (24.3)
Cancer	9 (15.3)	9 (12.2)
TICS Scores over time	***Mean (SD)***	***Mean (SD)***
Baseline	26.3 (5.4)	27.5 (4.3)
Year 1[a]	23.4 (6.0) *	26.0 (5.5) *
Year 2[b]	22.0 (6.0) **	26.3 (5.4) **

	African American (n=59)	Non-African American (n=74)
	Mean (SD)	*Mean (SD)*
Year 3[c]	23.1 (6.6)*	26.6 (5.2)*

[a]Sample size is n=58 (African American) and n=74 (Non-African American)

[b]Sample size is n=54 (African American) and n=65 (Non-African American)

[c]Sample size is n=48 (African American) and n=57 (Non-African American)

Note.

*p<0.05,

**p<0.001

Table 2

The Relationship of Race to TICS Scores Over Time Based on GEE Analyses[1]

	Model 1	Model 2	Model 3
	β(SE)	*β(SE)*	*β(SE)*
Race	-0.66 (1.05)	-0.93 (1.10)	-1.14 (1.15)
Time	-0.26 (0.16)	-0.31 (0.17)	-0.32 (0.17)
Race*Time	-0.92 (0.38)*	-0.80 (0.41)*	-0.80 (0.41)*
Gender		1.57 (1.01)	1.59 (0.99)
Age		-0.24 (0.06)*	-0.23 (0.06)*
Education		0.60 (0.10)*	0.60 (0.01)*
Depression Subscale of NPI			0.44 (0.23)
Behavioral Symptom Rating Scale			-0.68 (0.32)*

[1] GEE=Generalized Estimating Equations

Note.

* p<0.05