CLINICAL ASPECTS OF DEMENTIA IN AFRICAN-AMERICAN, HISPANIC, AND WHITE PATIENTS

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This article examines the relationship between ethnicity, cognitive deficits, functional impairment, and psychiatric symptoms in patients with dementia. The data are from a cross-sectional study of patients evaluated at the Northern California Alzheimer's Disease Center (ADC). Using the ADC database of patient information, the authors compared sociodemographic and clinical variables in 187 African-American patients, 69 Hispanic patients, and 1317 white patients with Alzheimer's disease (AD), ischemic vascular dementia (IVD), and mixed dementia (AD/IVD). Multivariate analysis indicated the following results:

1. African-American patients and Hispanic AD patients had lower risk of depressed mood compared to white patients;
2. African-American patients had lower risk for anxiety than whites;
3. Hispanic patients with mixed dementia had lower rates of apathy compared to whites.

Future studies are needed to examine how ethnic group differences in dementia are based on the interaction of cultural differences; effects of age, education, and psychosocial variables; and biological differences in the course of dementia. (*J Natl Med Assoc.* 2000;92:15–21.)

Key Words: Alzheimer's disease ◆ geriatric psychiatry ◆ dementia

Minority elderly populations have increasingly become the focus of geriatric psychiatry research. Demographic studies predict an increase in elderly African-American and Hispanic populations and an associated decline in white (non-Hispanic) elders over the next three decades.[1] Alzheimer's disease (AD) and other types of dementia will continue to represent a significant medical disorder for elderly populations. Little is known about ethnic differences in psychopathology or functional disability in Alzheimer's disease (AD) or mixed dementia (AD/ischemic vascular dementia).[2] This paucity of information is particularly troublesome because epidemiological studies suggest that African-American compared to white patients have higher rates of dementia with associated cerebrovascular disease.[2–5] Recent studies suggest that there are significant differences in the clinical characteristics of dementia among different ethnic groups. Some studies have reported that, compared to whites, African Americans and Hispanics with dementia have greater cognitive impairment, severity of dementia, greater functional impairment, and more behavioral disturbances.[6–9] Other investigators have reported differences in the prevalence of depression, psychotic symptoms, anxiety, and apathy.[8,10–11]

The goal of this study was to:

1. compare cognitive impairment in African-American, Hispanic, and white patients with AD or mixed dementia.
2. compare functional impairment in African-

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Table 1. Ethnic Differences in Dementia Patients with Adjustment for Covariates*

Variables	African Americans (n = 187)	Hispanics (n = 69)	Whites (n = 1317)
% (N)†			
AD	83.4 (156)	81.2 (56)	83.3 (1097)
Mixed dementia	14.5 (27)	13.2 (9)	14.6 (192)
Percentage of men	24 (50)	27.3 (21)	34.5 (500)
Means (± SD)‡			
Age (years)	75.8 (0.6)	77 (0.9)	76.5 (0.2)
Duration (years)	9.9 (0.7)*	11.7 (1.1)	11.0 (0.3)
Education (years)	10.0 (0.3)	6.3 (4.2)**	12.5 (0.1)
MMSE[a] (0–30)	16.5 (0.4)	15.2 (0.9)	15.4 (0.2)
BDRS[a] (0–100)	56.2 (2.5)	59.5 (4.3)	61 (1.0)
BIMCT[a] (0–54)	15.6 (0.6)	14.1 (1.0)	14.7 (0.2)

*Adjusted for age, education, and gender.
†Chi square model.
‡ANOVA model. SD = standard deviation. *$p < 0.05$; **$p < 0.01$.

American, Hispanic, and white patients with AD or mixed dementia.
3. compare prevalence of psychiatric symptoms in African-American, Hispanic, and white patients with AD or mixed dementia.

Based on earlier studies,[6–11] we predicted that, compared to white patients:

1. African-American and Hispanic patients would have greater cognitive deficits.
2. African-American and Hispanic patients would have greater functional impairment.
3. African-American patients would have lower rates of depression.
4. African-American patients would have lower rates of apathy.
5. African-American patients would have higher rates of anxiety.

METHODS

Subjects

Subjects were 1573 patients evaluated at the Northern California Alzheimer's Disease Centers (ADCs) between January 1987 and May 1995. All subjects had a diagnosis of either AD or mixed dementia. All subjects were self-identified as either African-American, Hispanic, or white (non-Hispanic). All patients and caregivers underwent structured diagnostic interviews to determine demographic factors and symptoms of dementia. All patients participated in neurological evaluations and neuropsychological testing to assess severity of cognitive and functional impairment and prevalence of psychiatric symptomatology. A team of neurologists, nurses, and neuropsychologists performed diagnostic evaluations. The diagnoses of probable AD, possible AD, or mixed dementia were assigned according to the criteria of the National Institute of Neurological and Communicative Disorders and Stroke/Alzheimer's Disease and Related Disorders Association (NINCDS/ADRDA) and State of California ADCs.[12,13]

Clinical and demographic data were compiled in the ADC Minimum Uniform Data Set (MUDS), a database of information derived from patients and caregiver reports and diagnostic evaluations. Psychiatric symptoms in the MUDS were based on DSM III-R criteria for mood, anxiety, or psychotic disorders. Table 1 shows the demographics of our study population. Ethnic identification data of subjects indicated that 11.9% (n = 187) were African American, 4.4% (n = 69) were Hispanic, and 83.7% (n = 1317) were white. The demographics of the ADC patients closely resembled the ethnic composition of surrounding northern California communities. Northern California census data for the 1999 report that among the population of community-dwelling elders aged 60 and older 10.6% (n = 39,017) are African American, 6.3% (n = 30,102) are Hispanic,

and 79.5% (n = 366,397) were white. Complete data were not available for each clinical characteristic or psychiatric symptom; therefore, the number of patients varied for each analysis. Analysis of demographic information indicates that compared with white patients African-American patients had a shorter duration of illness and Hispanic patients had fewer years of education. There were no significant differences in age, gender, or dementia subtypes among the three ethnic groups.

Screening Instruments

Demographic information, Mini-Mental State Exam scores (MMSE), Blessed Roth Dementia Rating Scale (BDRS), Blessed Information-Memory-Concentration Test (BIMCT) scores and prevalence of psychiatric symptoms were extracted from the MUDS.[14,15] Prevalence of psychiatric symptoms was based on patient and caregiver reports of the presence or absence of the symptoms. The symptoms were coded as "0" for not present and "1" for present.

MMSE and BICMT scores were used to assess severity of cognitive impairment. The MMSE is an 11-item examination that assesses memory, orientation, attention, and language. The MMSE is a reliable, valid screening instrument used to assess the presence, severity, and progression of dementia. MMSE scores range from 0 to 30 with lower scores indicating greater cognitive impairment. The BICMT is a 50-item examination that assesses memory, mental control, orientation, language, and visual spatial construction ability. BIMCT scores range from 0 to 54 with lower scores indicating greater cognitive impairment. BDRS is an 11-item functional assessment instrument that rates the patient's ability to perform independently activities of daily living (ADLs). BDRS rates two groups of activities: physical ADLs (eg, eating, dressing, and toileting) and instrumental ADLs (eg, housekeeping, money management). BDRS scores were based on caregiver reports. BDRS scores range from 0 to 120 with higher scores indicating greater impairment in the capacity to perform ADLs.

Statistical Analysis

Chi-squares were used to compare gender and ethnicity between dementia subtypes. Analysis of variance (ANOVA) using the SAS General Linear Model (GLM) was done to compare mean differences by dementia subtypes for continuous variables (MMSE, BDRS, and BIMCT scores; age; years of education; and duration of illness). The relationship of psychiatric symptoms by dementia subtype was examined using logistic regression. Models examining differences in dementia subtypes designated AD-only cases as the reference category. All modeling was done in two steps. First, unadjusted models were used that included only the main effect terms, and then adjustments for confounding by gender, age, education, ethnicity and MMSE scores were added to the model. We used (GLMs) to examine the interaction between BDRS scores, dementia subtypes, and psychiatric symptoms. All results reported are products of two-tailed analyses at the 95% significance level.

Table 2. Mean BDRS Scores by Ethnicity and Dementia Subtype Adjusted for Covariates*

Dementia Subtype	African Americans (n = 187)	Hispanics (n = 69)	Whites (n = 1317)
AD	52.1	54.8	61.1
Mixed dementia	71.5†	82.5	80.6

*Adjusted for age, gender, education, and MMSE.
†$p < .001$.

RESULTS

Table 1 compares levels of cognitive impairment and functional impairment in the three ethnic groups. Initially, there were no significant ethnic differences in MMSE, BDRS, or BICMT scores.

Table 2 shows the relationship of BDRS scores, ethnicity, and dementia subtype using ANOVA. White patients with AD had lower BDRS scores than white patients with mixed dementia. There was no significant difference in BDRS scores of African-American patients with AD alone compared with African-American patients with mixed dementia. There was no significant difference in BDRS scores of Hispanic patients with AD alone compared with Hispanic patients with mixed dementia.

Table 3 shows the relationship between ethnicity and psychiatric symptoms in AD. The risk of anxiety was 40% lower, and the risk of depressed mood was 60% lower in African-American patients than in white patients. The risk of depressed mood was 50% lower in Hispanic patients. There were no signifi-

Table 3. Risk of Psychiatric Symptoms in AD Patients by Ethnicity Adjusted for Covariates*

Symptoms	African Americans n (%)	Hispanics n (%)	Whites n (%)	Logistic Regression			
				African Americans OR	95% CI	Hispanics OR	95% CI
Anxiety	35 (23.8)	16 (38.1)	340 (35.7)	0.6‡	0.4–0.9	1.1	0.7–2.2
Apathy	81 (39.5)	28 (38.4)	668 (48)	0.8	0.06–1.0	0.7	0.4–1.2
Delusions	102 (50.5)	35 (46.7)	728 (51.7)	1.0	0.7–1.3	0.8	0.5–1.3
Depressed mood	34 (19.9)	14 (23)	426 (34.1)	0.4‡	0.3–0.7	0.5†	0.2–0.9
Hallucinations	44 (21.5)	19 (25.3)	313 (22.7)	1.0	0.7–1.5	1.1	0.6–2.1

*Adjusted for age, gender, education, ethnicity, and MMSE scores.
†$p < 0.05$; ‡$p < 0.01$.
OR = odds ratio: Black/Caucasian; Hispanic/Caucasian; CI = confidence intervals.

Table 4. Risk of Psychiatric Symptoms in Mixed Dementia Patients by Ethnicity Adjusted for Covariates*

Symptoms	African American		Hispanics	
	OR	95% CI	OR	95% CI
Anxiety	0.6	0.2–1.6	0.8	0.1–5.5
Apathy	0.7	0.3–1.5	0.2†	0.03–0.9
Delusions	0.9	0.4–2.0	0.2	0.04–1.1
Depressed mood	0.7	0.3–1.6	0.4	0.1–2.1
Hallucinations	0.8	0.3–2.1	1.4	0.3–5.8

*Adjusted for age, gender, education, ethnicity, and MMSE.
†$p < 0.05$.
OR = odds ratio: African American/white; Hispanic/white; CI = confidence intervals.

cant ethnic differences in the prevalence of apathy, delusions, or hallucinations. Table 4 describes the relationship between ethnicity and psychiatric symptoms in mixed dementia. The risk of apathy was 80% lower in Hispanics. There were no significant ethnic differences in the prevalence of anxiety, delusions, depressed mood, or hallucinations in mixed dementia.

Major findings are:

1. Hispanic patients with AD had lower risk of depressed mood.
2. African-American patients with AD had lower risk of depressed mood.
3. African-American patients with AD had lower risk for anxiety.
4. Hispanic patients with mixed dementia had lower risk of apathy.

Secondary findings are:

1. No difference in severity of functional impairment between African-American patients with AD and African-American patients with mixed dementia.
2. No difference in severity of functional impairment between Hispanic patients with AD and Hispanic patients with mixed dementia.
3. White patients with AD had less severe functional impairment than white patients with mixed dementia.

DISCUSSION

This study presents findings from a large-scale comparative analysis of functional impairment and psychiatric symptoms in AD or mixed dementia in a multi-ethnic group of patients. All patients were evaluated using rigorous diagnostic criteria and were well matched in terms of age, gender, and dementia severity. This study shows that there are ethnic differences in psychopathology and functional impairment in AD and mixed dementia. Our study presents both new findings and results consistent with earlier studies.

Lower prevalence of depressed mood in Hispanic patients with AD has not been previously reported. Numerous studies report higher rates of depressive symptoms among community-dwelling Hispanic elderly and among Hispanic patients with dementia.[16–18] The lower prevalence of depression may be due to atypical disease presentation, underreporting of symptoms, and limited knowledge about depression and dementia among Hispanic patients and caregivers. Several investigators sug-

gest that depression among Hispanic elders may present differently and often goes undiagnosed and untreated.[16,17]

Recent studies suggest that Hispanic patients rely on themselves or the church to deal with mental health problems more often than they use physicians or other professionals.[6]

Lower prevalence of depressed mood in African-American patients with AD among African-American nursing home patients (most of whom had dementia) has been reported in earlier studies.[8,18–20] However, research on the prevalence of depression among African-American and Hispanic elderly with dementia has produced conflicting results. Several studies have documented increased prevalence of depressive symptoms in elderly African Americans, especially with comorbid medical illness.[21–23] Other investigators report no difference in prevalence of depressive symptoms between African-American and white patients with dementia.[24,25] Accurate assessment of depression may be more difficult in nonwhite populations, because ethnic elders are more likely to report somatic complaints, irritability, or religious concerns than dysphoric mood.[26] Other authors have noted that insensitivity of the depression screening instruments and reporting biases related to sociocultural values may differ between races.[24] These potential sources of bias may lead to underdiagnosis of depression in African-American and Hispanic patients.

Lower prevalence of apathy among Hispanic patients with mixed dementia has not been previously reported. Apathy and other negative symptoms of dementia are associated with abnormalities in anterior cingulate, subcortical white matter regions, caudate, and thalamus.[27]

Lower prevalence of anxiety in African-American patients with AD is consistent with our original hypothesis and was reported in our previous study.[11] Because anxiety and depression are often closely associated,[28–30] one might hypothesize that there exist similar neurobiological and psychosocial factors that contribute to the lower prevalence of these two disorders among African-American and Hispanic patients with AD. There have been relatively few epidemiological studies of anxiety in elderly populations. Data from the Epidemiological Catchment Area study suggest that the lifetime prevalence of anxiety disorders among the elderly is approximately 34.05%.[31] A recent study suggests that anxiety may be more common among elderly patients with dementia, with prevalence rates as high as 70%.[30] Thus, the prevalence of anxiety among dementia patients in our study is comparable to rates reported among samples of community-dwelling elders.

Numerous investigators have identified the special problems related to dementia assessment in ethnic elderly patients. Factors such as ethnicity, language, and low levels of education can adversely affect performance on tests of cognitive function.[32,33] There are relatively few instruments with age-corrected, population-based normative data based on ethnic elderly populations. Standardized neuropsychological test batteries available for Spanish-language assessment have significant limitations and may overestimate or underestimate cognitive functioning depending on which normative group is used.[34,35] Hispanic patients had lower levels of education, which may have impaired their performance on cognitive tests and contributed to overestimation of the severity of their dementia.

Ethnic differences in prevalence of psychiatric symptoms in dementia may be determined by numerous factors, including sensitivity of the neuropsychological instruments, case selection, cultural bias of the examiner, communication difficulties, and the ability of the informant (i.e., patient, caregiver, clinician) to detect and report symptoms.[2,25,36–39]

Similar levels of functional impairment between African-American patients with AD alone or patients with mixed dementia have not been previously reported. Also similar levels of functional impairment between Hispanic patients with AD alone or mixed dementia have not been previously reported. But, our results are consistent with earlier studies that report white patients with mixed dementia have more severe functional impairment than white patients with AD alone.[2,11] The finding that dementia subtype does not have a significant effect on severity of functional impairment among African-American or Hispanic patients may be a result of the relatively small number of minority patients compared with the number of white patients available for this study. In addition, differences in functional impairment between AD and mixed dementia in African-American and Hispanic patients may become more apparent later in the course of the illness, an effect not discernible in the current study.

Even though the BDRS is often used to measure functional impairment, this instrument has several

disadvantages. The BDRS, which is derived from caregiver ratings, may be biased because it depends on the caregiver's knowledge of the patient's self-care skills and willingness to disclose this information. Caregiver report instruments may more actually reflect what the caregiver allows the cognitively impaired patient to do rather than the actual capacities of the patient.

The generalizability of our results is limited by several factors, including the cross-sectional research design and absence of neuropathologically confirmed diagnoses. Our study used psychiatric symptom checklists to assess prevalence of psychopathology rather than standardized rating scales and structured clinical interviews (e.g., Structured Clinical Interview for DSM-IV). Because most of the Hispanic patients in this study were Mexican-American or native-born Mexicans, our results are not readily generalizable to other Hispanic subgroups owning to differences in culture and language.

Further research is needed to validate the above results and examine how additional psychosocial (e.g., availability of social network, level of acculturation) and neurobiological factors contribute to ethnic differences in functional impairment and psychopathology in dementia. Longitudinal studies are needed with reliable neuropsychological instruments that have been cross-validated in ethnic minority populations.[40–42] Future studies can address sociocultural bias in assessment of functional impairment by utilizing direct observation of performance of familiar "everyday" tasks or problems.[43] Studies utilizing neuroimaging techniques such as functional magnetic resonance imaging and positron emission tomography might provide valuable information about the relationship between degree of cerebral white matter disease, infarct location and patterns of cerebral blood flow, and the prevalence of depression and apathy in dementia. Future cross-cultural studies of dementia are needed to explore whether ethnic group differences are based on the interaction of cultural differences; effects of age, education, and psychosocial variables; and biological differences in the course of dementia.

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