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Prevalence of Depression among Stroke Survivors: Racial-Ethnic Differences

Kezhen Fei, MS[1,2], **Emma K.T. Benn, DrPH**[1,2], **Rennie Negron, MPH**[3], **Guedy Arniella, LCSW**[4], **Stanley Tuhrim, MD**[5], and **Carol R. Horowitz, MD, MPH**[1,6]

[1]Center for Health Equity and Community Engaged Research, Icahn School of Medicine, New York, NY

[2]Center for Biostatistics, Icahn School of Medicine, New York, NY

[3]Yale Institute for Network Science, Yale University, New Haven, CT

[4]Institute for Family Health, New York, NY

[5]Department of Neurology, Icahn School of Medicine, New York, NY

[6]Department of Medicine, Icahn School of Medicine, New York, NY

Abstract

Background and Purpose—Although post-stroke depression is common, racial-ethnic disparities in depression among stroke survivors remain under-explored. Thus, we investigated the relationship between race/ethnicity and depression in a multi-racial-ethnic stroke cohort.

Methods—Baseline survey data of validated scales of depression and functional status, demographics, comorbidities and socioeconomic status were used from a recurrent stroke prevention study among community-dwelling urban stroke/TIA survivors.

Results—The cohort included 556 participants with a mean age of 64 years. The majorities were Black (44%) or Latino (42%), female (60%), had their last stroke/TIA nearly two years prior study enrollment, and lived below the poverty level (58%). Nearly one in two Latinos, one in four Blacks and one in eight Whites were depressed. Multivariate logistic regression showed that survivors who were younger, female, had three or more comorbid conditions, were functionally disabled from stroke, lacked emotional or social support, and who took antidepressants prior to study entry had higher risk of depression. Time since last stroke/TIA did not affect the chance of depression. After adjusting for all above risk factors, Latinos had three times the odds of depression (95% CI: 1.18 – 6.35) than Whites; Blacks and Whites had similar odds of depression.

Conclusion—This study reveals that Latino stroke survivors have a significantly higher prevalence of depression compared to their non-Latino counterparts.

Corresponding author: Kezhen Fei, MS, Icahn School of Medicine, 1425 Madison Avenue, L2-43, New York, NY 10029; Phone: 212-659-9592; Fax: 212-423-2998; kezhen.fei@mountsinai.org.

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Keywords

Depression; Prevalence; Racial/Ethnic Disparity

Introduction

Post-stroke depression (PSD) is prevalent, underdiagnosed and one of the most commonly ignored complications of stroke.[1] Racial-ethnic minorities have higher incidence and recurrence of stroke, poorer clinical outcomes, poorer functional scores and 1-year all-cause re-hospitalization after acute ischemic strokes.[2, 3] Though data are limited, there appear to be racial-ethnic disparities in the prevalence of depression in the general population; Blacks (14.2%), and Hispanics (14.6%) have a higher prevalence of depression than Whites (10.9%).[4] Yet, little is known about disparities in PSD. Most prior studies of racial-ethnic differences in PSD have relied heavily on hospital registry data alone.[5, 6]

To our knowledge, no previous studies have disaggregated PSD prevalence in racial-ethnic minorities. We conducted a comprehensive study of PSD using surveys of community-dwelling stroke/TIA survivors in order to examine racial-ethnic differences in PSD among a diverse, urban population.

Methods

For this secondary analysis, we used data from the Prevent Recurrent All-Inner city Stroke through Education (PRAISE) study conducted in New York City between 2009 and 2012, using a community-based participatory research approach, discussed in detail elsewhere.[7] This study received Institutional Review Board approval.[8] For the survey, the team recruited cognitively intact adults (screened with an adaptation of the Blessed Dementia Scale) who had a stroke/TIA within the past five years, from local hospitals, health centers, a visiting nurse service and community organizations such as churches and senior centers. We evaluated PSD using the Patient Health Questionnaire-8, a commonly used scale validated in English and Spanish.[9, 10] In the current sample, the internal consistency of the eight PHQ questions was reliable with a Cronbach's alpha of 0.78. We defined participants as having PSD if they had PHQ-8 sum score ≥ 10.[11] We assessed race/ethnicity through self-report, categorized into three groups: non-Hispanic White (White), non-Hispanic Black (Black), and Latino. We excluded those not self-identified in one of the three groups due to their very small numbers. Other demographic covariates included age, gender, socioeconomic status (SES, including income and insurance status) and current smoking status.

The team used other validated instruments to assess stroke-related disability with the modified Rankin scale (mRS) (0–2 functional, 3–4 disabled),[12] comorbidity with the Charlson Index,[13] and emotional support with a single question, "How many people can you count on to give you emotional support, such as talking over problems to help you with a difficult decision?".[14] Direct prescription fill records of antidepressant medications obtained from participants' pharmacies for the one year prior to the study were used as an indicator of antidepressant use before joining the study.

Statistical analysis

Variables were summarized as mean ± standard deviation or proportion. Bivariate analyses were conducted using student t-tests, and chi-square tests for continuous and categorical variables respectively. Multivariate logistic regression was performed to assess racial-ethnic differences in PSD, by adjusting for independent risk factors significantly associated with PSD in addition to potential confounders associated with both race/ethnicity and PSD in bivariate analyses. All analyses were conducted in SAS 9.3 (SAS Institute, Inc. Cary, NC). Statistical significance was assessed at the 0.05 level.

Results

As shown in Table 1, the 556 participants included in the study had an average age of 63.5 (SD=11.2) years, 60% were women, 14% White, 44% Black, and 42% Latino. Of the 231 Latinos, 61% spoke Spanish only, 53% reported their place of origin as Puerto Rico, 29% as the Dominican Republic, and the remainder were from other Caribbean, Central or South American nations. Participants had 1.6 stroke/TIAs on average, and the majority (80%) had had their last stroke/TIA more than a year ago. Nearly half were disabled from their stroke/TIA, as indicated by a mRS of 3 or 4, and nearly two thirds had three or more comorbid conditions. Only one third were married or living with a partner, but nearly all reported having emotional social support.

About one-third (31%) of the participants were currently experiencing PSD, and about one fourth were taking antidepressant medications prior to study enrollment. Participants who had a stroke/TIA within a year and those had more than a year ago had similar rates of PSD 33% vs. 30% (p=0.47). The rate of PSD differed significantly across racial-ethnic groups: Latino (41%), Black (26%), and White (13%), p<.0001. In comparison, rates of depression in the general adult population do not show such large disparity: Latino (15%), Black (14%) and White (11%).[4] Individuals of Puerto Rican origin had a higher prevalence of PSD compared to other Latinos (49% vs. 32%, p=0.01). Subjects with PSD were about 4 years younger than non-PSD subjects (61 vs. 65 year, p=0.0002), more were female (70% vs. 55%, p=0.001), had greater than 3 comorbidities (72% vs. 58%, p=0.001) and were disabled (66% vs. 39%, p<.0001; Table 1).

Black and Latino participants were about eight years younger, on average, than Whites (p<.0001). A higher proportion of Latino and Black participants had 3 or more comorbid conditions than Whites (70% vs. 61% vs. 45% respectively, p=0.0004); were disabled by stroke (54% vs. 49% vs. 23%, p<.0001); Latinos also received antidepressant medications prior to joining the study at a higher rate than Whites and Blacks, 32% vs. 28% and 22% respectively (p=0.0496). Other demographic and clinical comparisons by racial-ethnic groups can be found in Table 2.

Multivariate logistic regression showed that survivors who were female (OR=1.64; 95%CI: 1.07–2.53), functionally disabled from stroke (OR=2.43; 95%CI: 1.59–3.70), had 3 or more comorbid conditions (OR=1.55; 95%CI: 1.00–2.40), and taking antidepressant prior study entry (OR=1.85; 95%CI: 1.20–2.85) had higher risk of PSD; those of older age (OR=0.97; 95%CI: 0.94–0.99) and had emotional social support (OR=0.38; 95%CI: 0.20–0.73) were

less likely to have PSD; time since last stroke/TIA did not affect the chance of depression (OR=1.00; 95%CI: 0.87–1.15). After adjusting for all above protective/risk factors, the odds of PSD for Latinos were 2.75 (95% CI: 1.18–6.35) times higher than that of Whites; the odds of PSD were similar for Blacks compared to Whites (OR=1.33; 95% CI: 0.58–3.05). Detailed unadjusted and adjusted results are shown in Table 3. Additional multivariate logistic regression also confirmed that Puerto Ricans had 4.5 times higher odds (95%CI: 1.8–11.2) of PSD compared to Whites, while Other Hispanics had 3 times higher odds (95%CI: 1.1–8.2) of PSD compared to Whites; participants spoke Spanish only had similar odds of having PSD compared to those who spoke English.

Discussion

We found that disproportionately more Latino stroke survivors have PSD than Whites and Blacks, and this racial-ethnic difference is widened among stroke/TIA survivors than in the general population. Puerto Ricans have strikingly higher rate of PSD as compared to other Latinos, this seems to exacerbate their increased general prevalence of depression.[15]

The lack of Black-White difference is consistent with the findings of Robinson and Price.[5] Other studies have found that Blacks were less likely to be diagnosed with PSD, and to receive treatment for depression if diagnosed.[6] However, our definition of depression was based on patient self-report, not clinical reporting, allowing us to include undiagnosed depression.

Our study had several strengths. We screened stroke survivors from a community setting with a high proportion of minority patients, enabling us to have a better understanding of racial-ethnic disparities of PSD. The in-depth information about place of origin suggested within-group heterogeneity in PSD, and could help to target specific vulnerable Latino subgroups. Our study included pharmacy records for the year prior to study enrollment, which allowed us to control for pre-enrollment depression, since depression itself is an important and significant predictor of PSD.

There were several limitations to this study. We had no data on lesion location or information from neuroimaging, and some literatures show that location may be associated with PSD. There may be a selection bias of who participated. Patients who declined or were unable to participate due to their physical or mental state, may have given us an underestimate of the prevalence of PSD. These are estimates of PSD prevalence about two years post stroke on average, so our findings do not capture PSD immediately post stroke, and PSD prevalence varies overtime. Lastly, as is the case for most non-randomized studies, there is always the potential for bias as a result of unmeasured confounding.

Conclusions

Our study reveals a significantly higher rate of PSD among Latinos, as compared with Whites and Blacks, after adjusting for demographic and clinical risk factors. Further elucidation of possible modifiable factors to reduce PSD burden is needed given the significant burden of recurrent stroke in this population. Researchers and clinicians could

consider studying and providing targeted screening and treatment of PSD, especially among Latino stroke survivors.

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Table 1

Patient Characteristics by PSD

	Total (N=556)	Without PSD N=386 (69%)	With PSD N=170 (31%)	*p*
Socio Demographics				
Age, mean ± SD (years)	63.5 ± 11.2	64.6 ± 11.1	60.8 ± 10.9	0.0002
Female	333 (60%)	214 (55%)	119 (70%)	0.0012
Race/Ethnicity				<.0001
White	80 (14%)	70 (18%)	10 (6%)	
Black	245 (44%)	180 (47%)	65 (38%)	
Hispanic	231 (42%)	136 (35%)	95 (56%)	
Insurance				0.0006
Medicaid	172 (31%)	103 (27%)	69 (41%)	
Medicare	219 (39%)	150 (39%)	69 (41%)	
Commercial	137 (25%)	111 (29%)	26 (15%)	
Other	28 (5%)	22 (6%)	6 (4%)	
Low Income (≤ $15,000/year)	319 (58%)	201 (52%)	118 (69%)	0.0002
Married/Live with partner	186 (33%)	140 (36%)	46 (27%)	0.0339
Have emotional-social support	504 (91%)	359 (93%)	145 (85%)	0.0040
Health Status & Behavior				
Disabled (mRS 3–4)	263 (47%)	151 (39%)	112 (66%)	<.0001
High Comorbidity (Charlson ≥ 3)	347 (62%)	224 (58%)	123 (72%)	0.0013
Year since stroke, mean ± SD	1.8 ± 1.5	1.8 ± 1.4	1.7 ± 1.5	0.5640
# strokes/TIAs, mean ± SD	1.6 ± 1.2	1.6 ± 1.1	1.8 ± 1.2	0.0608
Pre-study anti-depressant usage	152 (27%)	87 (23%)	65 (38%)	0.0001
Smoking	95 (17%)	56 (15%)	39 (23%)	0.0136

Tables 2

Demographics and Biomarkers by Race/Ethnicity

	Black N=245 (44%)	**Latino N=231 (42%)**	**White N=80 (14%)**	***p***
Age, mean ± SD (years)	62 ± 11	63 ± 11	71 ± 10	<.0001
Female	160 (65%)	131 (57%)	42 (53%)	0.0555
Insurance				<.0001
Medicaid	84 (34%)	83 (36%)	5 (6%)	
Medicare	88 (36%)	111 (48%)	20 (25%)	
Commercial	62 (25%)	25 (11%)	50 (63%)	
Other	11 (4%)	12 (5%)	5 (6%)	
Low Income (≤ $15,000/year)	142 (58%)	167 (73%)	10 (13%)	<.0001
Have emotional-social support	224 (91%)	207 (90%)	73 (91%)	0.7774
Disabled (mRS 3–4)	120 (49%)	125 (54%)	18 (23%)	<.0001
High Comorbidity (Charlson ≥ 3)	150 (61%)	161 (70%)	36 (45%)	0.0004
Years since stroke, mean ± SD	1.8 ± 1.5	1.7 ± 1.4	2.2 ± 1.5	0.0137
# strokes/TIAs, mean ± SD	1.6 ± 1.0	1.7 ± 1.3	1.5 ± 1.1	0.3300
Pre-study anti-depressant usage	55 (22%)	75 (32%)	22 (28%)	0.0496
Smoking	54 (22%)	32 (14%)	9 (11%)	0.0183

Table 3

Odds Ratios With 95% Confidence Intervals in Predicting PSD

	Unadjusted model	Adjusting for social demographics	Adjusting for clinical risks	Adjusting for social-demographic and clinical risks
White	Ref	Ref	Ref	Ref
Black	2.53 (1.23–5.20)	1.47 (0.67–3.25)	1.90 (0.89–4.06)	1.33 (0.58–3.05)
Latino	4.89 (2.40–9.97)	3.02 (1.36–6.70)	3.60 (1.70–7.60)	2.75 (1.18–6.35)
Age		0.97 (0.95–0.99)		0.97 (0.94–0.99)
Male		Ref		Ref
Female		1.92 (1.28–2.89)		1.64 (1.07–2.53)
Income > $15,000/year		Ref		Ref
Low income		1.26 (0.78–2.01)		1.14 (0.70–1.86)
Commercial insurance		Ref		Ref
Medicaid		1.38 (0.72–2.64)		0.93 (0.47–1.85)
Medicare		1.34 (0.73–2.47)		1.02 (0.54–1.95)
Other		0.81 (0.28–2.38)		0.86 (0.28–2.62)
No emotional social support		Ref		Ref
Have support		0.43 (0.23–0.79)		0.38 (0.20–0.73)
Year since stroke/TIA			0.99 (0.86–1.13)	1.00 (0.87–1.15)
Charlson comorbidity < 3			Ref	Ref
≥ 3			1.43 (0.94–2.17)	1.55 (1.00–2.40)
Functional (mRS 0–2)			Ref	Ref
Disabled (mRS 3–4)			2.48 (1.67–3.68)	2.43 (1.59–3.70)
No antidepressant use			Ref	Ref
Used prior to study			1.85 (1.22–2.81)	1.85 (1.20–2.85)
Non-smoking			Ref	Ref
Smoking			1.73 (1.06–2.83)	1.44 (0.85–2.44)