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Stroke Risk Factor Status and Use of Stroke Prevention Medications among Hispanic/Latino adults in the HCHS/SOL study

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Abstract

Background and purpose: We investigated the prevalence, awareness and control of vascular risk factors (VRFs) and the use of antithrombotic and statin agents in Hispanic Community Health Study/Study of Latinos (HCHS/SOL) participants with self-reported history of stroke or transient ischemic attack.

Methods: Sociodemographic characteristics, medications, and prevalence of different VRFs were recorded. VRF diagnoses and goals were based on the recommendations of professional organizations. Factors associated with optimal VRF control and use of antithrombotic and statin agents were investigated using multivariate logistic regression.

Results: The analysis included 404 participants (39% males). The prevalence of hypertension, dyslipidemia, and diabetes mellitus (DM) were 59%, 65%, and 39%, respectively. Among those who met the diagnostic criteria for these diagnoses, the frequencies of awareness were 90%, 75% and 83% respectively. In participants who were aware of their VRFs, the prevalence of controlled hypertension, dyslipidemia, and DM were 46%, 32%, and 54%. Approximately 46% of the participants were on antithrombotics, 39% on statins, and 26% on both. Only 38% of those with

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Disclosures

None.

atrial fibrillation received anticoagulation. In multivariate analyses adjusted for baseline sociodemographic characteristics, older age was associated with uncontrolled HTN and DM. Residing in the US for ≥10 years and born in the US were associated with uncontrolled DM, female sex with uncontrolled dyslipidemia, and lack of health insurance with decreased use of statins and hyperlipidemia.

Conclusion: Hispanic/Latino adults in the US have high prevalence and awareness of VRFs but low adherence to secondary stroke prevention strategies. Older adults, females, and uninsured persons are vulnerable groups that may benefit from targeted interventions.

Clinical Trial Registration: http://www.clinicaltrials.gov. Unique identifier: NCT02060344

Keywords

stroke prevention; Latino; Hispanic

Introduction

Stroke is the leading cause of disability and a major cause of death in the US. Prior epidemiologic studies suggest that with the extended life expectancy in the US, the number of strokes between 2010 and 2050 will more than double, with the majority of the increase occurring in the elderly and underrepresented groups[1,2]. The burden of cerebrovascular diseases in Hispanic/Latino individuals, the fastest growing ethnic group in the US, is particularly elevated at younger ages, leading to early disability and substantial direct and indirect costs[3,4].

Hispanic/Latino individuals have high prevalences of modifiable vascular risk factors (VRFs) and stroke [3,4]. In addition, observational studies done in this population have shown concerning percentages lack of awareness and control of VRFs with noticeable variations between males and females [5–8]. Recent studies showed that almost 90% of the stroke risk is attributable to modifiable VRFs[9]. Numerous trials confirmed the beneficial effect of VRF control in stroke prevention. The implementation of stroke prevention strategies constitutes the most effective method to reduce the burden of stroke. The American Heart Association/ American Stroke Association (AHA/ASA) developed scientific statements with specific recommendations for the prevention of recurrent stroke or transient ischemic attack (TIA) [10]. However, the adoption of these preventable measures in the general population remains suboptimal[11]. Different factors including language barrier, distrust in the medical system, and limited access to health care are common in Hispanic/Latino individuals and make them particularly vulnerable to experiencing health-related disparities[4,12,13]. In this study, we investigated the prevalence, awareness and control of VRFs and the use of antithrombotic and statin agents in US Hispanic/Latino adults with a history of stroke/TIA in the Hispanic Community Health Study/ Study of Latinos (HCHS/SOL) and the factors influencing them.

Methods

Study Population

The HCHS/SOL study is a multicenter, prospective, population-based cohort study. The details of the sampling methods and design have been previously published[14]. Briefly, 16,415 self-identified Hispanic/Latino adults aged 18 to 74 years, randomly selected in four US urban communities (Bronx, New York; Chicago, Illinois; Miami, Florida; San Diego, California), were enrolled in the study between March 2008 and June 2011. The HCHS/SOL included participants from Cuban, Dominican, Mexican, Puerto Rican, Central American, and South American backgrounds. The study was approved by institutional review boards at each participating institution, and written informed consent was obtained from all participants. For the purpose of this study, we utilized data from the first exam. On inquiry, the HCHS/SOL data used here can be made available. Information on how to access data and study protocols are included in https://sites.cscc.unc.edu/hchs/

Variables

Age, education, country of origin, household income, preferred language, years of residence in the US of foreign-born participants, health insurance status, and history of coronary heart disease (CHD), stroke/TIA, physical activity, and current cigarette smoking were self-reported. CHD was defined as reported history of myocardial infarction, coronary bypass surgery, balloon angioplasty, or stent placement in coronary arteries. Adherence to a healthy diet was determined using a dietary score as previously described[5]. Briefly, two 24-hour dietary recalls of predefined foods categories were averaged. Participants were assigned a score of 1–5 according to their sex-specific quintile of daily intake of saturated fatty acids, potassium, calcium, and fiber. A score of five denotes the most favorable quintile. The four scores were summed and participants in the highest 40th percentile were considered to have a healthy diet[14]. Participants were asked to bring all prescription and nonprescription medications taken in the past month to the study visit. Weekly averages of physical activity were calculated based on the self-reported daily engagement in moderate or vigorous physical activity multiplied by 7. Alcohol use was self-reported and defined as “at-risk” or “heavy alcohol use” based the criteria of National Institute on Alcohol Abuse and Alcoholism by having more than five drinks on any day or 14 drinks per week for males, and more than four drinks on any day or seven drinks per week for females[15]. The methodologies used to measure the different VRFs were previously described[14,16].

In brief, blood pressure was measured on the right arm using an automatic sphygmomanometer, with the participant in the seated position and the arm resting. Three blood pressures measurements were obtained 1 minute apart following an initial 5-minute rest period. The average of these 3 blood pressure values was used in this analysis. Hypertension (HTN) was defined as blood pressure ≥140/90 mmHg or on a blood pressure lowering medication. Due to recent changes in the definition of HTN and for reference purposes only, we also present baseline information using the new definition of HTN of ≥130/80 mmHg[17]. Dyslipidemia was defined as total cholesterol ≥240 mg/dL, LDL-cholesterol ≥160 mg/dL, HDL-cholesterol ≤40 mg/dL, or on a cholesterol lowering medication. Diabetes mellitus (DM) was defined as fasting glucose ≥126 mg/dL, 2-hour post

load glucose ≥200 mg/dL, HbA1c ≥6.5%, or on a glucose control medication[5]. Atrial fibrillation (AFib) was based on self-reported history of AFib or findings on electrocardiography. Peripheral arterial disease (PAD) was defined as ankle brachial index ≤0.9 or reported history of intermittent claudication. Chronic kidney disease (CKD) was defined by glomerular filtration rate <60 ml/min/1.73m^2. HCHS/SOL participants were asked to wear an Apnea Risk Evaluation System for one night which allows the computation of the apnea hypopnea index (AHI). Sleep apnea (OSA) was self-reported or based on an apnea-hypopnea index (AHI) of at least 15 events per hour[14,18]. Weight and height were determined as previously described[14,16]. Overweight was defined as body mass index (BMI) of ≥25 kg/m^2 and obesity as BMI ≥30 kg/m^2 [3].

Secondary stroke prevention measures included control of major VRFs and use of pharmacologic treatments recommended by the AHA/ASA. VRF goals and lifestyle recommendation are summarized in Table 1 [10,17,19–21]. Pharmacologic treatments included use of antithrombotic agents (antiplatelet agents or anticoagulants), treatment with statin agents (regardless of the type or dose), or the concomitant use of antithrombotic and statin agents[10]. *Prevalence* was calculated as the percentage of individuals that met the diagnostic criteria for each VRF. Participants were considered *aware* for a VRF if they met the diagnostic criteria and reported having it. Participants who were aware for a VRF and met the goals shown in Table 1 were categorized as *controlled*.

Statistical Analyses

Continuous variables were described by means and standard deviations. Categorical variables were reported as frequencies with weighted percentages. Baseline sociodemographic characteristics and prevalence of VRFs for HCHS/SOL participants with and without history of stroke/TIA were calculated. Sex-specific differences were reported in the distribution of different VRFs [5–8]. Thus, among those with history of stroke/TIA, data were compared for males and females. Among stroke/TIA participants, the awareness for each VRF was calculated among those who met the diagnostic criteria for it. The frequencies of controlled VRF were calculated among those who admitted having the VRF. The burden of vascular disease was determined by calculating the cumulative number of stroke risk factors (ie, HTN, dyslipemia, DM, sleep apnea, current smoker, alcohol at risk, physical activity not at goal, and overweight/obesity) and the number of comorbid atherosclerotic diseases (i.e., history of CHD, PAD, and chronic kidney disease). Results for males and females were compared using ANOVA test or Pearson Chi-square test. Multivariate logistic regression analysis was used to investigate the factors associated with VRF at goal and use of secondary stroke prevention medications. Results were adjusted for variables that influence the adoption of VRF control measures[4]. These include age, sex, level of education, household income, health insurance status, language preference, and years of residence in the US. Seven multi-covariate logistic regression analysis were performed adjusting simultaneously for the other six variables. Odds ratios (ORs) with 95% confidence intervals (95% CI) were computed and p values less than 0.05 were considered statistically significant. All analyses were performed in SAS version 9.4 (SAS institute, Cary, NC).

Results

Out of the 16,331 HCHS/SOL participants, 404 (males=159) had a self-reported history of stroke/TIA. Participants with history of stroke/TIA were older and more likely to be males. They also had longer residency in the US, lower household income, and attained lower levels of education. Furthermore, they were more likely to be insured and, as expected, had higher prevalences of VRF (Supplemental Table I).

In the subpopulation of participants with stroke/TIA, the mean±SD age was 55±1 years with females being slightly older (55±1 vs. 54±2 years; p<0.001) than males. The frequencies of other baseline sociodemographic characteristics were comparable in males and females. Approximately three quarters of the participants were insured immigrants and two thirds reported residing in the US 50 states for at least 10 years. In addition, only a quarter reported English as their preferred language, suggesting a limited degree of acculturation (Table 2). Approximately, 98% of the participants had at least one modifiable stroke risk factor and 50% had four or more (Supplemental Table IIA–B). The cumulative number of stroke risk factors was comparable in males and females. The most commonly encountered VRF was overweight/obesity with a prevalence of 84%. The prevalence of HTN, dyslipidemia, DM, and OSA were 59%, 65%, 39%, and 28%, respectively (Table 3). Comorbid vascular diseases represented by CHD, PAD, and CKD, were observed in 22%, 41%, and 34% of the participants and these were equally represented in males and females; however, males were more likely to have no comorbid vascular diseases (48% vs. 32%; p=0.025) (Supplemental Table IIA–B). In terms of lifestyle, about 1 in 5 of the participants were current smokers and 6% were at-risk drinkers. In addition, 58% achieved the physical activity goal and only 30% had a favorable diet score (Table 3). No significant sex-specific differences were observed with the exception of heavy alcohol use which was almost 10 times higher in males (10.9% vs. 1.1%, p<0.001).

Among subjects with stroke/TIA, 90%, 75%, and 83% were aware of their HTN, dyslipidemia, and DM, respectively. No differences were observed between males and females. The awareness of OSA was low (39%), particularly in males (16% vs. 60%; p<0.001). HTN, dyslipidemia, and DM were at goal for 46%, 32%, and 54% of the participants, respectively. About 38% of participants with AFib were on anticoagulants and only 23% of those with OSA were on continuous positive airway pressure. No significant sex-specific differences were noted in the frequencies of VRFs at goal with the exception of controlled dyslipidemia (41% vs. 23%, p=0.018) and AFib on treatment with anticoagulants which were less common in females (62% vs. 18%, p=0.047). In addition, 46% of the participants were on antithrombotic agents, 39% on statins, and 26% on both, with no differences among males and females (Table 3).

Supplemental table III depicts the prevalence of VRF at goal as well as the use of antithrombotic agents and statins by baseline characteristics. In multivariate logistic regression analyses, older age was associated with poor control of HTN and DM but more frequent use of antithrombotic agents and statins. In addition, females were more likely to have uncontrolled dyslipidemia and lack of health insurance was associated with decreased odds of using statins and achieving optimal lipid control. Furthermore, participants that

preferred using English, immigrants who had resided in the US for more than 10 years and those born in the US were less likely to achieve optimal DM control (Table 4).

Discussion

Our study shows that Hispanic/Latino adults with stroke/TIA had high prevalence and awareness of acquired VRFs but suboptimal control of modifiable VRFs and use of antithrombotic and statin agents. Several observational studies demonstrated that modifiable VRFs are prevalent among Hispanic/Latino individuals with history of stroke. In the Brain Attack Surveillance in Corpus Christi (BASIC) study, the prevalence of HTN, dyslipidemia, and DM were 78%, 33%, and 53%[22]. In addition, in the Northern Manhattan Stroke Study (NOMASS), the prevalences were 81%, 37%, and 39%, respectively[23]. In comparison, in our cohort we observed a frequency of 56% for HTN and 64% for dyslipidemia. These differences can be explained, at least partially, by methodological factors. The BASIC study, for example, included Mexican Americans and NOMASS included, primarily, Caribbean American Hispanic adults. In addition, the average age in these two studies was between 65–70 years and the diagnosis of stroke was based on hospital screening logs. In comparison, our study had a more diverse composition. In addition, the mean age of our cohort was 54 years and the inclusion criteria were based on reported history of stroke/TIA. Similar to NOMASS, HCHS/SOL is collecting longitudinal information on new strokes and this information will be reported in future studies.

The AHA has identified four healthy habits that are associated with ideal cardiovascular health. These include adopting a healthy diet, living an active life, maintaining an appropriate weight, and smoking cessation[24]. Here we observed that only 30% of the participants with stroke/TIA had a healthy diet suggesting that Hispanic/Latino adults may benefit from post-stroke dietary education and nutritional coaching. We also observed lower frequencies of physical activity at goal in participants with history stroke/TIA than in those without such history. This observation may be associated, at least in part, with the high prevalence of overweight/obesity noted in the stroke/TIA group. Stroke survivors typically suffer from cognitive, neuropsychiatric and/or physical impairments which compromise physical endurance, balance and mobility. Our study cannot conclusively identify if suboptimal physical activity and overweight/obesity are a consequence or the cause of the stroke. However, they support further research in the development of strategies that facilitate the adoption of healthy lifestyles. Obesity predisposes to OSA which is commonly seen in stroke survivors[10,25]. Mechanistically, OSA is associated with inflammation, refractory hypertension, and AFib, which are all risk factors for stroke and CHD. Observational studies showed that OSA is common in Hispanic individuals[3,26]. The prevalence of OSA varies based on the AHI cutoff used to make the diagnosis. In our study, using the conservative cutoff of AHI≥15 events per hour, we observed that OSA is particularly prevalent among participants with stroke/TIA (28%). In comparison, the prevalence of OSA in participants without this history was only 11% ($p<0.001$).

There is limited information about awareness of VRFs in Hispanic/Latino individuals with stroke/TIA. In our study, the frequencies of awareness for HTN, DM, and dyslipidemia were 90%, 83% and 75%, respectively. In comparison, the awareness for OSA was particularly

low (39%). Recall-bias may play a role in the reporting of OSA. In the 2014 AHA/ASA Secondary Stroke Prevention Guidelines, performing OSA screening did not receive class I recommendation. Thus, these studies are not routinely performed in all patients. Therefore, it is plausible that our participants were not screened for OSA at the time of the stroke/TIA, as opposed to not recalling the diagnosis. It should be noted that only a fourth of those that knew about the diagnosis of OSA were on treatment with continuous positive airway pressure. Thus, the possibility of undertreatment should also be considered.

The most striking finding of our study is the low frequency of optimal VRF control among stroke/TIA patients. Approximately half of the stroke participants who knew about the diagnosis of HTN and DM achieved the recommended goals and 32% of those with dyslipidemia had an optimal lipid profile. According to data from the National Health and Nutrition Examination Survey, Mexican Americans have low frequencies of blood pressure, HbA1c and LDL-cholesterol at goal [3]. In addition, in mixed cohorts of Hispanic/Latino individuals with and without stroke, the frequencies of HbA1c and lipid profile at goal were 44–56% and 61–69%, respectively [6,8]. Our findings expand on these observations and confirm that a substantial number of stroke survivors do not meet ideal VRF targets. In relation to pharmacologic treatment, anticoagulants are the mainstay of stroke prevention in AFib. Cross-sectional studies have repeatedly shown that underutilization of anticoagulants in AFib constitutes a major challenge in stroke prevention[27]. In our study, though the number of subjects with AFib was very small to draw solid conclusions, we observed that 40% of them received treatment with anticoagulants. A similar trend was observed in the Florida Puerto Rico Atrial Fibrillation Stroke Study where only 25–30% of the Hispanic individuals with stroke and AFib were treated with anticoagulants[28].

In our final model, we observed that older patients had higher odds of having uncontrolled HTN and DM. In contrast, dyslipidemia was not associated with age, an observation that correlates with the increased use of statins noted in older participants. Uncontrolled dyslipidemia was associated with female sex. Though our study did not investigate the possible causes for this association, data from a previous study of Hispanic/Latino adults with hypercholesterolemia showed that females, particularly those older than 45 years, are less likely to be on lipid-lowering drugs than males[6]. The association between uncontrolled diabetes with preferential use of English and extended residence in the US, determined as US born or immigrants residing in the US ≥10 years, merits a special note. Migration to the US and advanced acculturation are accompanied by changes in nutritional behaviors which increase the risk of overweight/obesity, hyperinsulinism, and hyperglycemia[4,8,29]. Increased acculturation also correlates with higher frequency of insurance coverage[4]. In our study we observed that lack of insurance is independently associated with uncontrolled lipid profile and decreased use of statins. This suggests that interventions aiming to enhance the use of secondary stroke prevention medications in Hispanic/Latino individuals must address barriers to accessing health coverage.

Our study has several limitations. Several outcomes were self-reported with the consequent possibility of recall bias as well as diagnostic bias such that drug-treated individuals were more likely to be included in the groups with HTN, DM and dyslipidemia. Therefore, subjects who did not recall that they had received a diagnosis of VRF but who were

controlled with life-style modifications were not captured in our study. AFib and sleep apnea had a low frequency, which limits our ability to draw solid conclusions about them. In addition, we were not able to differentiate participants by stroke subtype. Approximately 85% of the strokes in the community are ischemic in origin[3]. In addition, a significant number of stroke/TIA participants in our study had coexisting CHD, PVD, dyslipidemia, and DM which are conditions that are commonly treated with antithrombotic agents and statins. Thus, it is unlikely that the approximately 46% utilization of antithrombotic agents observed in our study could be completely explained by the inclusion of hemorrhagic cases. Furthermore, history of cerebral hemorrhage is no longer considered a contraindication for treatment with statins. Thus, the possible inclusion of hemorrhagic stroke does not explain the frequency of statin use of only 39% observed in our cohort[30]. Finally, in this study we used the conservative goals recommended by the 2014 AHA/ASA stroke prevention guidelines[10]. VRF goals evolve and may differ from one patient to another. As an example, a blood pressure goal of <140/90 mmHg is typically recommended after stroke [10,17,31]. The 2017 AHA guidelines for the management of hypertension, however, recommend lower goals for particular populations, such as individuals at high risk of CHD[17]. Similarly, the LDL-Cholesterol goal of <100 mg/dL used in this study was indicated for secondary stroke prevention by the AHA/ASA when our patients were assessed. More recently, however, a lower goal of <70 mg/dL was recommended for particular populations, including patients with atherosclerotic cardiovascular disease[20]. Using this new goal may be indicated in many of our participants and doing so would likely produce different results.

In conclusion, our results indicate that wide areas for improvement exist in the implementation of stroke prevention strategies in Hispanic/Latino adults with stroke/TIA. The elderly, individuals with extended residence in the US, females, and those without health insurance constitute vulnerable groups that may benefit from targeted interventions.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Non-standard Abbreviations and Acronyms

AFib	atrial fibrillation
AHA/ASA	American Heart Association/American Stroke Association
AHI	apnea-hypopnea index
BMI	body mass index
CHD	coronary heart disease

CKD	chronic kidney disease
DM	diabetes mellitus
HCHS/SOL	Hispanic Community Health Study/ Study of Latinos
HTN	hypertension
OSA	obstructive sleep apnea
PAD	Peripheral arterial disease
TIA	transient ischemic attach
VRF	vascular risk factors

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Table 1.

Goals for Secondary Stroke Prevention

Vascular risk factor	Goal
Hypertension[10,17]	<140/90 mmHg
Dyslipidemia[10,20]	LDL-cholesterol <100 mg/dL
Diabetes[10,21]	HbA1c <7%
Obstructive Sleep Apnea[10]	On treatment with continuous positive airway pressure
Atrial Fibrillation[10]	On treatment with anticoagulants (warfarin, low-molecular weight heparin, dabigatran, apixaban, rivaroxaban, or edoxaban)
Healthy Diet[10]	Diet scores among the highest 40th percentile
Physical Activity[19]	≥150 minutes per week of moderate-intensity or ≥75 minutes per week of vigorous-intensity aerobic exercise

Table 2:

Baseline sociodemographic characteristics of stroke/TIA participants by sex

Variables	All N=404	Males N=159	Females N=245	P
Age *	54.6 (1.1)	54.2 (1.6)	55.0 (1.5)	<0.001
Age > 60 years **	140 (38.2)	60 (38.1)	80 (38.2)	0.980
Education **				
Less than high school	180 (39.5)	73 (39.6)	107 (39.4)	0.984
Complete high school	87 (21.4)	33 (22.5)	54 (20.3)	0.719
More than high school	135 (39.0)	52 (37.8)	83 (40.1)	0.738
Household income **				
< $ 20,000	251 (59.4)	95 (55.4)	156 (63.4)	0.238
$ 20,000–50,000	100 (28.1)	44 (33.4)	56 (22.8)	0.094
> $ 50,000	18 (4.0)	9 (4.8)	9 (3.2)	0.506
Not reported	35 (8.5)	11 (6.5)	24 (10.6)	0.235
Immigrant <10 years in the US **	47 (15.1)	23 (17.2)	24 (13.0)	0.509
Immigrant ≥10 years in the US **	278 (62.8)	107 (58.7)	171 (67.0)	0.509
US born	78 (22.0)	28 (24.1)	50 (19.956)	0.509
English as preferred language **	108 (26.9)	37 (24.9)	71 (28.9)	0.518
No health insurance **	104 (23.3)	37 (22.2)	67 (24.5)	0.680

* Mean (SE)

** n (%)

Table 3:

Prevalence, awareness, frequency of optimal vascular risk factor control and pharmacologic treatment among stroke/TIA participants by sex

Variables	All n (%)	Men n (%)	Females n (%)	P
Prevalence				
Vascular Risk Factors				
Hypertension	244 (58.5)	97 (56.3)	147 (60.7)	0.536
Dyslipidemia	256 (64.7)	109 (65.9)	147 (63.6)	0.726
Diabetes	158 (39.3)	61 (39.3)	97 (39.4)	0.988
Behavioral Risk Factors				
Sleep apnea	92 (28.4)	41 (30.3)	51 (26.6)	0.601
Alcohol at risk	10 (5.6)	8 (10.9)	2 (1.1)	0.002
Overweight/obesity	336 (83.7)	128 (81.1)	208 (86.3)	0.296
Obesity	213 (51.0)	74 (46.3)	139 (55.7)	0.174
Diet score >40th percentile	133 (29.4)	52 (31.1)	81 (27.8)	0.610
Physical activity at goal	220 (57.5)	97 (62.5)	123 (52.4)	0.145
Current smoker	92 (22.4)	39 (22.3)	53 (22.5)	0.979
Comorbid Vascular Conditions				
Atrial fibrillation	23 (6.1)	9 (7.0)	14 (5.2)	0.569
Coronary heart disease	97 (22.1)	38 (17.9)	59 (26.3)	0.142
Peripheral arterial disease	133 (41.3)	46 (34.0)	87 (48.2)	0.072
Chronic kidney disease	121 (33.5)	43 (31.82)	78 (35.1)	0.613
Awareness				
Vascular Risk Factors				
Hypertension	217 (89.8)	87 (91.4)	130 (88.3)	0.527
Dyslipidemia	202 (74.6)	78 (67.8)	124 (81.4)	0.111
Diabetes	131 (82.5)	131 (82.5)	78 (75.2)	0.062
Behavioral Risk Factors				
Sleep apnea	35 (38.7)	10 (19.0)	25 (60.0)	<0.001
Comorbid Vascular Conditions				
Peripheral arterial disease	27 (22.5)	10 (27.1)	17 (19.4)	0.397
Chronic kidney disease	91 (74.7)	34 (72.3)	57 (76.9)	0.677
Optimal control of vascular risk factors				
Vascular Risk Factors				
Hypertension	113 (45.8)	46 (45.2)	67 (46.3)	0.899
Dyslipidemia	82 (31.9)	42 (40.7)	40 (22.7)	0.018
Diabetes	80 (54.3)	30 (51.6)	50 (56.9)	0.646
Behavioral Risk Factors				
Sleep apnea	23 (23. 4)	7 (16.1)	16 (31.3)	0.187
Pharmacologic treatment				

Variables	All n (%)	Men n (%)	Females n (%)	P
Antithrombotic agents	208 (45.8)	77 (43.7)	131 (47.8)	0.561
Statins	151 (39.0)	60 (39.5)	91 (38.6)	0.906
Antithrombotic agents and statins	111 (26.4)	45 (27.8)	66 (25.0)	0.651

Table 4:

Multivariate logistic analysis. Association of sociodemographic factors with vascular risk factor at goal and use of stroke preventive drugs agents among stroke/TIA participants.

	HTN at Goal OR (95% CI) (n=387)	Diabetes at Goal OR (95% CI) (n=380)	Dyslipidemia at Goal OR (95% CI) (n=378)	Atrial Fibrillation on anticoagulation OR (95% CI) (n=380)	On Treatment with Antithrombotics OR (95% CI) (n=388)	On Treatment with Statins OR (95% CI) (n=380)	On Treatment with Antithrombotics and statins OR (95% CI) (n=388)
Age *	**0.95(0.92–0.97)**	**0.96(0.93–0.99)**	0.98(0.95–1.01)	0.99(0.93–1.05)	**1.06(1.03–1.08)**	**1.08(1.05–1.11)**	**1.06(1.03–1.10)**
Female	0.79(0.42–1.48)	1.19(0.58–2.46)	**0.49(0.28–0.86)**	0.56(0.16–1.95)	1.16(0.65–2.07)	1.06(0.57–1.98)	0.88(0.46–1.71)
>High School	0.55(0.29–1.03)	1.83(0.87–3.88)	0.67(0.39–1.17)	0.65(0.16–2.63)	1.03(0.55–1.94)	0.99(0.50–1.93)	1.12(0.54–2.32)
Income >20,000	1.15(0.58–2.30)	1.32(0.64–2.73)	0.88(0.45–1.75)	1.61(0.54–4.81)	0.68(0.37–1.23)	1.40(0.77–2.56)	1.08(0.55–2.15)
English as preferred language	1.28(0.57–2.90)	**0.25(0.12–0.55)**	0.91(0.43–1.96)	2.63(0.58–11.95)	1.28(0.64–2.53)	1.26(0.60–2.66)	1.05(0.49–2.21)
Immigrant ≥10 years in the US **	1.21(0.45–3.22)	**0.06(0.01–0.32)**	0.66(0.27–1.60)	**0.18(0.04–0.70)**	1.66(0.63–4.37)	1.44(0.52–3.94)	1.53(0.50–4.67)
US born **	2.27(0.52–9.85)	**0.03(0.00–0.24)**	0.91(0.30–2.76)	3.58(0.40–32.09)	3.21(0.93–11.13)	2.01(0.54–7.53)	3.26(0.78–13.64)
No Health Insurance	1.43(0.69–2.99)	1.39(0.55–3.49)	**0.42(0.18–0.95)**	0.47(0.05–4.42)	0.91(0.47–1.77)	**0.47(0.23–0.97)**	0.66(0.30–1.44)

Each variable was adjusted by the rest of the variables included in the table.

*Per year

**Immigrant <10 years in the US as reference