Coronary Heart Disease Risk in Cuban Americans with and without Type 2 Diabetes

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Citation

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Abstract

Background and AimsCoronary heart disease can be greatly reduced by lifestyle changes. The death rate from diabetes for Cuban Americans is more than twice that for non-Hispanic Whites; yet, recent studies of risk factors and health outcomes for Cuban Americans are lacking. The purpose of this study was to assess dietary, biometric and clinical predictors of coronary heart disease (CHD) in Cuban Americans by diabetes status and gender. Secondary objectives were to assess predictors of the incidence of stroke, angina and coronary or peripheral artery disease (CAD/PAD). Methods and ResultsCuban American adults: N = 367; 190 with type 2 diabetes (72 males, 118 females) and 177 (59 males, 118 females) without diabetes were recruited from a randomly generated mailing list from Broward and Miami-Dade counties, Florida, USA. Significant differences in predictors of CHD risk were found by gender and diabetes status. As expected, we found a positive association between diabetes and stroke; however, female participants were less likely to report having stable angina than male participants. The probable CAD/PAD was predicted by SBP and age; whereas, probable unstable angina was associated with family history of coronary heart disease, being male and smoking.ConclusionsWe found gender and diabetes status delineated risk factor patterns among a Cuban American sample. These findings suggest the need to revise health policies to promote early screening and aggressive treatment of CHD risk factors for both men and women. Prospective studies of CHD risk factors and mortality for Cuban Americans are warranted.

INTRODUCTION

Coronary heart disease (CHD) can be greatly decreased by lifestyle changes in diet, physical activity and tobacco usage. Despite public health campaigns, promoting healthy lifestyle modifications, CHD remains the leading cause of death in the United States for both men and women; in 2005 the mortality rate due to CHD was 211 per 10,000 deaths [1,2]. It has been well-established that individuals with diabetes are at greater risk for CHD than those without diabetes [2-6]. Diabetes is considered a risk factor for CHD and CVD by the Center for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH) [2, 6-7]. An estimated 23.6 million people (2007) in the United States (7.8% of the population) have diabetes [8]. The prevalence, incidence and mortality from all forms of CVD are 2-8 times higher for persons with than for persons without diabetes [9]. More specifically, the risk of death from coronary heart disease (CHD) for persons with type 2 diabetes is 2 to 4 times higher in comparison to persons without diabetes [10]. The vast majority of diabetes cases (90–95%) constitute type 2 diabetes [8]. Type 2 diabetes has been shown to be prevented by lifestyle changes in several large epidemiological studies across continents [6,9,11].

Cuban Americans are one of three major groups of Hispanic/Latino origin and represent 4% of the Hispanics in the United States [12]. Yet, Cuban Americans have been given little attention in recent health studies; instead, the majority of research has been conducted on Mexican and Puerto Rican Americans. Since each ethnic group has a unique social history, cultural identity, set of health behaviors and genetic predispositions to diseases, findings from one Hispanic subgroup are not applicable to others. The last major study conducted among Hispanic subgroups was the Hispanic Health and Nutrition Examination Survey (HHANES) which was conducted during 1982–1984 [3]. Analyses of the HHANES data indicated a higher prevalence of overweight, cigarette smoking and type 2 diabetes in Cuban Americans as compared to other Hispanic ethnicities [4]. Trends in socioeconomic status and lifestyle behaviors may have changed from when HHANES was conducted (over 25 year ago). More recently, but still over 10 years ago, the Miami Community Health Study [13] investigated three ethnicities (African Americans, Cuban Americans and non-Hispanic Whites) without diabetes and reported that Cuban Americans had higher insulin sensitivity (higher insulin response, post-glucose load) than non Hispanic Whites. These studies seem to indicate that Cuban Americans are at a high risk for CHD. Although there are ongoing epidemiological studies of Hispanics, there are no publications to date regarding Cuban American lifestyle risk factors for CVD.

The death rate from diabetes for Cuban Americans is more than twice that for non-Hispanic Whites (47 per 10,000 as opposed to 22 per 10,000) [14]. Cuban Americans have the highest proportion of diabetes as the underlying cause of their death (44%) as compared to Puerto Ricans (39%) and Mexican Americans (37%) [5]. Analysis of Hispanics as a homogeneous group masks the variation in the risk for diabetes mortality [5]. Health indicators for CVD such as smoking, abdominal obesity, hypercholesteremia as well as diabetes, may differ by gender and culture.

As such, Cuban American women may have a higher risk for CHD than Cuban American men. The literature to date indicates gender differences, where women with diabetes have a greater risk for CHD than men with diabetes [15]. Women with cardiovascular disease (CVD) have a greater prevalence of CVD morbidity and mortality than men [16]. In fact, major health disparities for women exist throughout the healthcare system [17]. Men are afforded earlier and more aggressive prevention and treatment modalities for CVD and diabetes than women [17]. Chou et al.'s [16] analysis of data from 31 private health plans through the National Committee for Quality Assurance (2005) indicates a significant health disparity for participants with diabetes. Women were less likely than men to achieve LDL levels of less than 100 mg/dl [16].

Even though there is ample information on the incidence and prevalence of type 2 diabetes, there is little information on CHD risk factors for Cuban Americans. Additionally, little is known about how these risk factors differ and interact among genders and diabetes status. Therefore, the purpose of this study was to assess dietary, biometrics, socio-demographic and clinical predictors of CVD in Cuban men and women with and without type 2 diabetes. Secondary objectives were to assess predictors of the incidence of stroke, angina and coronary or peripheral artery disease (CAD/PAD).

MATERIALS AND METHODS

STUDY SUBJECTS

The present study uses data from the complete sample set of a case control, single point study of age-group matched, Cuban Americans with and without type 2 diabetes. A total of 370 participants were recruited; seven participants reporting not having diabetes were re-classified as participants with type 2 diabetes. These participants were given their lab results and referred to their physician. An additional three were excluded for incomplete data, leaving a total of 367 Cuban-Americans: 190 with (72 males, 118 females) and 177 without diabetes (59 males, 118 females).

The participants were systematically recruited by selecting every tenth address from a randomly generated mailing list of Cuban Americans from Miami-Dade and Broward Counties, Florida. Approximately ten thousand letters were mailed. Three percent (N = 300) were undeliverable due to "unknown addresses" and 4% (N = 388) responded by telephone. Respondents were screened for eligibility and subsequently matched to those with and without type 2 diabetes by age grouping. Of the 388 candidates, 18 did not qualify and were excluded for the following reasons: two were not of Cuban heritage; seven had other chronic illnesses; and nine could not be matched by age grouping. Inclusion criteria for participants with type 2 diabetes were self-reported Cuban or Cuban-American ethnicity; age ³ 35 years, male and female; self-report of a medical diagnosis of type 2 diabetes; able to understand and complete all of the study protocol in English or Spanish; and willing and able to read and sign an informed consent form. Inclusion criteria for subjects without diabetes had the same criteria as for subjects with type 2 diabetes except they reported no medical diagnosis of any type of diabetes (type 1 or type 2). Respondents who reported having no diabetes but were later found to have diabetes by ADA standards were referred to their physicians and included in the study as participants with diabetes. Exclusion criteria were the following: treatment with insulin from the beginning of the diagnosis of diabetes; pregnant or lactating women; and self-report of major thyroid disorder or major psychiatric disorder. The study was approved by Florida International University's Institutional Review Board (IRB). Participants signed the IRB approved informed consent in accordance with in their preferred language, Spanish or English.

DATA COLLECTION

The demographics were collected in group settings. All written materials were provided in English or Spanish except for the food frequency questionnaire (FFQ). The FFQ was validated, previously, for Cuban Americans [18]. Trained bilingual interviewers were available to aid in the translation of the FFQ. Each participant was assigned a unique personal identification number (PIN) to ensure confidentiality. Data were collected from each participant in the principal investigator's laboratory. Blood collection and anthropometrics were conducted individually and privately with fully equipped blood collection and biometric measurement rooms.

Socio-demographic and medical history data were collected from a questionnaire that was composed by the investigator from a compilation of standardized and previously validated health-related questions.

CARDIOVASCULAR DISEASE ASSESSMENT

Specific questions taken from the World Health Organization's Rose Cardiovascular Questionnaire (WHO/Rose) [19] were used to assess the presence of the following risk factors for CHD: stroke; coronary artery disease (CAD) or peripheral artery disease (PAD); and unstable angina. To assess stroke, a yes or no response to question 23:"Have you ever had a stroke?" was used to determine the occurrence or absence of stroke. A positive response to question 10: "Have you ever had a severe pain across the front of your chest lasting for half an hour or more?" was coded for the presence of unstable angina. Although there is no absolute consensus for the classification of unstable angina, it is considered an intermediate state between stable angina and myocardial infarction and with symptoms of severe chest pain in the absence of exertion lasting for 20 minutes or more [20,21]. The WHO/Rose was chosen since it is a validated instrument for assessing angina as well as stroke, CAD and PAD in the general population [22]. The sensitivity of WHO/Rose for detection of definite angina was reported as 88% when compared to medical records (n=892) [22]. Heyden et al.[23] found the Rose questionnaire to have a sensitivity of 81% and a specificity of 97% for angina as compared to medical diagnosis. Symptoms of coronary artery or peripheral artery disease (CAD/PAD) were ascertained from question 24 of the Rose questionnaire, "Have you ever had weakness or loss of strength in an arm or leg lasting 24 hours or more?"

DIETARY VARIABLES

Dietary variables were collected using the Willet semi-quantitative food frequency questionnaire (FFQ) [24]. The 131-item FFQ had been validated previously in a pilot study of Cuban Americans in our laboratory and standardized in several other multiethnic population studies [18,24]. Dietary patterns, established over time may be better indicators of CVD risk [18,25]. We chose the Willet FFQ, since it is one of the few FFQ's that inquires food patterns over the course of a year.

BIOMETRIC MEASURES

Trained investigators measured blood pressure using standard methods. The average of the two blood pressure readings were used in the analysis of the data. Venous blood was collected from each subject after an overnight fast (at least 8 hours) by a certified phlebotomist in the principal investigator's lab using standard laboratory techniques. The analysis was performed by LabCorp®. Height was measured to the nearest 0.1 cm without shoes using a SECA standard stadiometer. Body weight was measured using a SECA balance beam scale (Seca Corp, Columbia, MD) to the nearest lb and converted to kg. Participants' body weights were measured with them wearing light indoor clothing with no shoes. Body mass index (BMI) was calculated as body weight (kg)/height (m^2). Overweight and obesity were defined by the National Institutes of Health (NIH) and categorized as BMI 25–29.9 kg/m^2 and ≥ 30 kg/m^2, respectively [26]. To determine central obesity, waist circumference (WC) was measured to the nearest 0.1 cm using a non-stretchable tape measure placed midway between the 12^{th} rib and iliac crest at minimal respiration to determine central obesity [27]. As defined by NIH, WC > 102 cm for men and > 88 cm for women was considered at risk for CVD [27].

STATISTICAL ANALYSIS

Descriptive statistics were performed using means and standard deviations for continuous variables and percentages for categorical variables. To select the relevant variables predicting CHD risk factors, forward multiple linear regression analysis was conducted. Analyses of associations between CHD risk factors and diabetes status, gender, demographics and diet were performed using several multivariate analyses models, controlling for age with CHD risk factors as the dependent variables. Multiple logistic regression analyses models were run to assess the cardiovascular risk factors that predicted stroke and angina. All continuous, clinical outcome variables were analyzed by Q-Q- plots for linearity. Of those outcome variables that were not normally distributed, BMI, WC, and triglycerides (TG) were log-transformed to attain normality. Alcohol was converted to a categorical variable. All statistical analyses were computed with SPSS® version 14.0 software for Windows®. All tests were two-sided and a P-value of < 0.05 was considered significant.

RESULTS

Approximately two-thirds of the participants were female. Educational level was not significantly different between groups. Over 70% and 60 % of participants with and without type 2 diabetes, respectively, reported incomes of under $20,000. The percentage of current smokers did not differ significantly by diabetes status. Over 50% of those with diabetes and almost half without diabetes were classified as obese. The overweight/obese combined group constituted 84.7% of those without and 87.9% of those with diabetes. A negative correlation of income level with A1C (–0.205, Spearman's rho, n=328 complete data, two tailed, p < 0.01) was observed. Group mean values for blood pressure, serum lipids and plasma blood glucose compared by diabetes status are presented in Table 1.

Figure 1

Group Statistics of Study Participants: Physical Characteristics

Variable	Without Diabetes n=167	With Diabetes n=176	*P*-value
	Mean ±SD		
Blood Pressure			
SBP (mm Hg)	130.6 ± 1.49	132.0 ± 1.15	0.456
DBP (mm Hg)	81.7 ± 1.15	79.4 ± 0.68	0.022
Blood Lipids			
TC (mg/dL)	204.8 ± 3.32	191.4 ± 3.03	0.003
TG (mg/dL)	139.8 ± 5.23	165.1 ± 5.34	0.001
HDL-C (mg/dL)	57.0 ± 1.13	50.8 ± 0.88	< 0.001
LDL-C (mg/dL)	119.9 ± 2.97	107.6 ± 2.58	0.002
Blood Glucose			
A1C (%) Recommended	5.88 ± 0.03 4-5.9	7.59 ± 0.12 < 7.0	<0.001
FPG (mg/dL) Recommended	96.0 ± 0.93 60-90	145.54 ± 4.92 70-130	<0.001
Age (years)	62.6 ± 11.4	65.2 ± 11.8	0.036
Age Diabetes	N/A	55.5 ± 14.5	
Years with Diabetes	N/A	9.62 ± 9.47	-
HTN (yes)	99 (44.0)	126 (56.0)	0.043
HTN medication (yes)	79 (43.4)	103 (56.6)	0.076
BMI (kg/m^2) ‖	29.95 ± 5.04	31.58 ± 6.50	0.008
Obese: BMI > 30	80 (45.2)	96 (50.5)	
WC (cm)	100.0 ± 12.4	105.5 ± 14.5	<0.001
Women	98.6 ± 11.7	104.9 ± 15.1	<0.001
Men	102.9 ± 13.3	106.5 ± 13.5	0.138
Stroke			
Yes	7 (4.0)	19 (10.0)	
No	170 (96.0)	171 (90.0)	0.024
CAD/PAD			
Yes	12 (6.8)	19 (10.0)	
No	165 (993.2)	171 (10.0)	0.268
Angina			
Yes	20 (11.3)	27 (14.2)	
No	157 (88.7)	163(85.8)	0.405

Values are reported as means ± standard deviation (SD) or number and percent. P-values based on independent sample t-test for continuous variables and χ^2 for categorical variables
Abbreviations: SBP = systolic blood pressure, DBP = diastolic blood pressure, TC = total serum cholesterol, TG = serum triglycerides, HDL-C = high density lipoprotein cholesterol, LDL-C= low density lipoprotein cholesterol, A1C = percent glycated hemoglobin, FPG = fasting plasma glucose, HTN = hypertension (Fisher Exact Test, 2-sided p-value used for binary variables HTN and HTN medication), BMI = Body mass index, WC = waist circumference, CAD/PAD = Coronary Artery/Peripheral Artery Disease
‖Due to missing values, the total number of subjects differs among variables.

The means of each group's values for calories and nutrient intake, based on the self-reported FFQ, are shown in Table 2. On average, participants with diabetes consumed significantly fewer calories, alcoholic beverages and carbohydrates than those without diabetes. A greater percentage of protein, total fat, MUFA and PUFA were consumed by participants with diabetes compared to those without diabetes. There were no significant differences in fiber and saturated fatty acids intake by diabetes status. Persons with diabetes consumed significantly less carbohydrates as percent of calories (% CHO) than those without as determined by logistic regression (χ^2=32.4, p < 0.001, OR: 0.933 [95 CI = 0.901-0.958]). Diabetes status, presence of CAD or angina and smoking were not associated with alcohol intake. Two risk factors for CVD: serum triglycerides and A1C were positively correlated for women with diabetes (n=113, r=0.284, p < 0.001) and without diabetes (n=108, r=0.270, p = 0.004); whereas the relationship was not significant for men (controlling for age and cholesterol medication).

Figure 2

Nutritional Profiles of Participants by Diabetes Status

Variable N = 367	Without Diabetes (n =175)	With Diabetes (n = 190)	P-value
	Mean ± SEM		
Kcal/day	2374 ± 59.9	2194 ± 66.3	0.044
% CHO	51.47 ± 0.56	46.57 ± 0.68	<0.001
% Protein	17.28 ± 0.24	19.78 ± 0.29	<0.001
% Total Fat	31.29 ± 0.45	34.24 ± 0.55	<0.001
% SFA	10.42 ± 0.19	10.68 ± 0.19	0.330
% MUFA	13.16 ± 0.25	15.19 ± 0.35	<0.001
% PUFA	4.97 ± 0.12	5.45 ± 0.13	0.006
Cholesterol (mg/day)	294.48 ± 8.84	305.59 ± 11.5	0.445
Fiber (g/day)	23.35 ± 0.77	22.96 ± 0.82	0.732
Alcohol (drinks/wk)	5.34 ± 0.90	3.10 ± 0.62	0.041

Abbreviations: SEM =standard error of the mean; CHO = carbohydrate; SFA = saturated fatty acid, MUFA = mono-unsaturated fatty acids, PUFA = polyunsaturated fatty acids. $p < 0.05$ was considered significant.

Results of a one-way analysis of variance (ANOVA) comparing those with diabetes to those without diabetes indicated that the measured clinical predictors of CHD risk were higher for respondents with than for those without type 2 diabetes (Table 3). Multivariate analysis by diabetes status and gender for the same clinical predictors of CHD were performed. Applying the Bonferroni correction (df = 9) indicated WC and metabolic equivalent of task (MET) were affected by income, employment status, reported level of health and family history of CHD. Participants who reported being in the workforce had lower physical activity than those who were unemployed or retired regardless of diabetes status (results confirmed by Spearman's rho and logistic regression). There was an inverse relationship between reporting poor health and amount of exercise by linear regression (beta = -0.186, p = 0.002). Smoking and family history of diabetes were included in the model and were not significant for WC or MET (Table 4).

Figure 3

CHD Risk Factors by Diabetes Status

	Without Diabetes		With Diabetes			
Continuous Variables	M (Std Dev)	95% CI	M (Std Dev)	95% CI	F	p-value
LnBMI	3.39 (0.17)	3.36, 4.41	3.43(0.20)	3.40, 3.46	6.03	0.015
LogWC	2.00 (0.05)	1.99, 2.00	2.02 (0.06)	2.01, 2.03	14.8	<0.001
LogDBP	1.91 (0.05)	1.90, 1.92	1.90 (0.05)	1.89, 1.91	4.35	0.038
Non-HDL-C	150.5 (44.5)	143.9, 157.1	139.5 (45.3)	133.1, 146.0	5.43	0.020
LogMET	1.35(0.64)	1.24, 1.45	1.17 (0.67)	1.06, 1.28	5.14	0.024

Abbreviations: LnBMI = natural log of body mass index; LogWC = base-ten log of waist circumference; Log DBP = base-10 log of diastolic blood pressure; Non-HDL-C = non-high density lipoprotein cholesterol; LogMET = base-10 log of metabolic equivalent of task.

Figure 4

Association of Socio-demographic Risk Factors of CHD by Diabetes Status and Gender

Corrected Model (9df)	F	p-value	R^2	Adj R^2
LogWC	4.34	<0.001	0.148	0.115
LogDBP	1.23	0.276	0.047	0.009
LogTG	2.27	0.019	0.083	0.046
LogMET	3.70	<0.001	0.128	0.093

Independent Variables	Dependent variables (1df) Partial p-values			
	Log WC	LogDBP	LogTG	LogMET
Income	0.010	0.962	0.453	0.074
Employment Status	0.359	0.972	0.328	<0.001
Smoking (Yes/No)	0.457	0.803	0.323	0.337
Self-reported Health	0.003	0.950	0.706	0.025
Family History of Diabetes	0.480	0.261	0.067	0.002
Family History of CHD	0.004	0.090	0.082	0.821
Diabetes Status	0.002	0.021	0.007	0.577
Gender	0.629	0.990	0.155	0.225
DS*Gender[a]	0.151	0.293	0.378	0.029

Abbreviations: LogWC = base-ten log of waist circumference; Log DBP = base-10 log of diastolic blood pressure: Log TG = base-ten log of serum triglycerides; LogMET = base-10 log of metabolic equivalent of task; DS = diabetes status.
[a]Refers to an interaction between diabetes status and gender.

Coronary heart disease risk factors by diabetes status and gender were examined by linear regression. The best model to predict central obesity (WC) included diabetes status, income, smoking and family history of diabetes (Table 5). Family history of CHD had a protective effect on central obesity. Gender by diabetes status interacted with physical activity level. Men with diabetes had higher MET values than women with diabetes (beta = 0.215, p =0.009); whereas the relationship was not significant for males and females without diabetes (beta = 0.024, p = 0.775).

Figure 5

: CHD Risk Factors Predicting Central Obesity

Model[b]	F = 4.28	R^2 =0.074 R^2 adj =0.057	P = 0.001
Independent Variables	Beta	t	Partial P-values
Income	0.113	1.89	0.060
Smoke (yes)	0.043	0.734	0.463
FH Diabetes	0.048	0.766	0.444
FH_CHD	-0.151	-2.49	0.014
Diabetes Status	0.224	3.56	<0.001

Abbreviations: FH_Diabetes = family history of diabetes; FH_CHD = family history of coronary heart disease
[a]Dependent variable: log of waist circumference
[b] Best linear regression model for predicting central obesity

Diabetes status, smoking and employment status were found to predict having no medical insurance by backward stepwise (conditional) logistic regression of CHD predictors (χ^2 (20 df) = 88.4, p < 0.001, Nagelkerke R^2 = 0.478). The model predicted 86.1% of the cases correctly. The sign of the parameters indicated those without type 2 diabetes, smokers and not employed were most likely to have no medical insurance coverage within the past year.

Diabetes status was the only predictor of stroke based on a forward conditional logistic regression of socio-demographic, dietary and clinical risk factors (χ^2 (1 df) = 7.69; p = 0.006). Participants with diabetes were more than four times as likely to suffer stroke as those without diabetes (OR=4.87 (95 CI = 1.36-17.4); p = 0.015) with 93.2% of the cases predicted correctly by logistic regression. Males, smokers, a family history of CHD and taking hypertensive medications were positively associated with angina (χ^2 (4 df) = 31.7, p < 0.001) with 86.1% of the cases predicted correctly by forward conditional logistic regression. The likelihood of CAD/PAD was also determined for the same risk factors by forward conditional logistic regression. Diastolic blood pressure and age were positively associated with CAD/PAD (χ^2 (2 df) = 12.4, p = 0.002). The model predicted 94% of the cases, correctly. The Nagelkerke R^2 for DBP, alone was 0.064 (explaining 6.4%); whereas DBP and age explained 12.4% of CAD/PAD.

DISCUSSION

Many of the characteristics of those with and without diabetes, such as overweight and 45 years or older, were indicative of high risk for CHD. For instance, over 80% of the combined sample was in the overweight or obese categories and the mean age for both groups was over 60 years. Those at risk for CHD are recommended to limit their saturated fat intake to < 7%; yet, in our sample both those with and without diabetes consumed a little over 10%. Based on caloric intake, approximately 30 and 33 grams of fiber per day for those with and those without diabetes would be recommended for healthy adults [28]. However, our findings indicated respondents consumed only 23 grams of fiber per day. Dietary fiber, particularly soluble fiber, was inversely associated with risk factors for CHD in numerous cohort studies; moreover relative risk of coronary events was found to be reduced by 14% per adjusted unit of fiber consumption [29].

Fiber has benefits in reducing blood pressure [30] and carbohydrate-induced high serum TG, referred to as hypertriacylglyceridemia (HPTG) [31-33]. Parks and Hellerstein [32] reported that replacing as little as 10% of fat with CHO can induce HPTG. Findings from recent studies evaluating health risks and protein intake indicated that participants with the highest protein intake had the lowest risk for CHD [34]. Similarly, in a 2-year randomized trial of obese participants, those with diabetes who were consuming a low carbohydrate diet had significantly lower A1C levels than those on a higher carbohydrate diet [35]. It is not clear how varying the-percentages of specific macronutrients can affect blood pressure. In the OmniHeart Randomized Trial, a 3-period, crossover feeding study of adults with pre-hypertension (n = 164), Appel et al. [31] substituted 10% of carbohydrate intake with protein, which resulted in decreased SBP by 1.4 mm Hg (p = 0.002) and DBP by 3.5 mm Hg (p = 0.006) at the 95% CI. Longitudinal studies of glycemic control, CHD risk factors and age are needed to establish the basis of these relationships in the Cuban population.

We found a positive association between diabetes and stroke as supported by national health interview survey across race and ethnicities [36]. For our sample, probable CAD/PAD was predicted by SBP and age; whereas, probable unstable angina was associated with family history of coronary heart disease, being male and smoking. Dietary factors and other clinical and socio-demographic risk factors were analyzed but were not significantly associated with CVD. Analysis of data from the National Health Interview Surveys (NHIS) revealed that the prevalence of CHD and stroke was negatively associated with education for persons without diabetes, whereas education was not significant for those with diabetes [36]. Female participants were less likely to report having stable angina than male participants. Since angina is an early indicator for the likelihood of myocardial infarction, our findings support the likelihood of undetected CVD and greater risk for mortality [16].

The present study had several limitations. First, as a cross-sectional design, our study could not assess cause and effect. Second, due to limited geographic sampling (Miami-Dade and Broward Counties, Florida) our study may not represent all Cuban Americans. Finally, although subjects were recruited randomly from a purchased list of Cuban Americans residing in Miami-Dade and Broward counties, there is a potential sample bias of those who chose and were eligible to participate

CONCLUSIONS

We found gender and diabetes status delineated risk factor patterns among a Cuban American sample. These findings suggest the need to revise health policies to promote early screening and aggressive treatment of CHD risk factors for both men and women. Prospective studies of CHD risk factors and mortality for Cuban Americans are warranted.

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