Association of a Culturally Defined Syndrome (*Nervios*) with Chest Pain and DSM-IV Affective Disorders in Hispanic Patients Referred for Cardiac Stress Testing

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Background: Hispanics have a high prevalence of cardiovascular risk factors, most notably type 2 diabetes. However, in a large public hospital in Houston, Texas, Hispanic patients referred for cardiac stress testing were significantly more likely to have normal test results than were Whites or non-Hispanic Blacks. We undertook an exploratory study to determine if *nervios,* a culturally based syndrome that shares similarities with both panic disorder and anginal symptoms, is sufficiently prevalent among Hispanics referred for cardiac testing to be considered as a possible explanation for the high probability of a normal test result.

Methods: Hispanic patients were recruited consecutively when they presented for a cardiac stress test. A bilingual interviewer administered a brief medical history, the Rose Angina Questionnaire (RAQ), a questionnaire to assess a history of *nervios* and associated symptoms, and the PRIME-MD, a validated brief questionnaire to diagnose DSM-IV defined affective disorders.

Results: The average age of the 114 participants (38 men and 76 women) was 57 years, and the average educational attainment was 7 years. Overall, 50% of participants reported a history of chronic *nervios,* and 14% reported an acute subtype known as *ataque de nervios.* Only 2% of patients had DSM-IV defined panic disorder, and 59% of patients had a positive RAQ score (ie, Rose questionnaire angina). The acute subtype, *ataque de nervios,* but not chronic *nervios,* was related to an increased probability of having Rose questionnaire angina ($P=.006$). Adjusted for covariates, a positive history of chronic *nervios,* but not Rose questionnaire angina, was significantly associated with a normal cardiac test result (OR=2.97, $P=.04$).

Conclusion: *Nervios* is common among Hispanics with symptoms of cardiac disease. Additional research is needed to understand how *nervios* symptoms differ from chest pain in Hispanics and the role of *nervios* in referral for cardiac workup by primary care providers and emergency room personnel. (*Ethn Dis*. 2004; 14:505–514)

Key Words: Chest Pain, *Nervios,* Cardiovascular Disease, DSM-IV Affective Disorder

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Introduction

Hispanics comprise approximately 13% of the US population and 24% of the population of the south central and western states.[1] Although Hispanics have a lower overall cardiovascular mortality rate when compared to non-Hispanic Whites, the prevalence of 2 major cardiovascular risk factors, hypertension and hyperlipidemia, among them is similar to that of Whites, and the prevalence of diabetes, a cardiovascular risk equivalent, is higher in Hispanics than in any other subgroup in the US population.[2,3] The appropriateness of screening for and management of cardiovascular risk factors in Hispanics may be affected by cultural differences in the presentation of symptoms associated with heart disease.

In our experience in a large, public healthcare system serving a multi-ethnic, urban population, we observed that referral of Hispanic patients from outpatient clinics to the cardiology or nuclear medicine services for evaluation of chest pain (CP) was common. However, our clinical impression was that the probability of a positive finding of coronary artery disease (CAD) was lower in Hispanics than in other ethnic groups referred for testing and was particularly low in Hispanic women. In order to confirm this impression, we conducted a review of the results of approximately 350 thallium stress tests and cardiac catheterizations performed at the public healthcare system's referral hospital. We found that Hispanics were significantly less likely than non-Hispanic Whites or Blacks to have a positive cardiac stress test. Among men, 32% of Hispanics, 43% of Blacks, and 56% of Whites had a positive stress test that had been ordered for evaluation of CP. Among women, the percentages were 7% of Hispanics, 19% of Blacks, and 30% of Whites.

The association between CP and objectively verified CAD is known to vary by gender and ethnic background.[4–11] We considered the possibility that a culture-specific syndrome, known as *nervios,* could be common among Hispanics referred for evaluation of CP and could be associated with the low probability of positive stress tests. *Nervios* has a wide range of symptoms including CP, shortness of breath, sweating, and dizziness, as well as other behavioral and emotional components. Some of the symptoms mimic the presentation of angina or acute coronary events. The syndrome also has obvious similarities to the psychiatric diagnoses of generalized anxiety disorder and panic disorder.[12,13]

The *nervios* syndrome has been studied primarily in the US mainland and in Puerto Rico, in Mexico, and in Central America, both from a medicoanthropological perspective[14–20] and a psychiatric perspective.[13,21,22] The definition and presentation of the syndrome varies among Hispanic subgroups. Salgado de Snyder et al[20] distinguish 2 general

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forms of *nervios*: *ataque de nervios,* which is observed among Caribbean Spanish-speaking persons, particularly Puerto Ricans, and *nervios,* which is expressed among inhabitants of Mexico and other Central American countries. Liebowitz et al,[13] based on the work of Guarnaccia et al,[18] have focused on *ataque de nervios* and its relationship to panic disorder and other psychiatric diagnoses among persons of Caribbean origin living in New York City. They described the typical presentation as: ". . . Symptoms include shaking, heart palpitations, a sense of heat rising in the head, and numbness of the hands. Behaviorally, the person begins to shout, swear, and strike out at others. The person then falls to the ground and either experiences convulsive body movements or lies as if dead." The nonacute form of *nervios* that is seen principally in Mexico, Central America, and South America is described as a chronic process that consists of both physical and emotional symptoms, is initiated when an idea becomes "stuck in the head," and gradually weakens the individual's physical and mental health.[14,18,20] The phrase typically used among Mexicans and other Central American groups to report a history of *nervios* is, "*Sufro de los nervios,*" that is, "I suffer from nerves." Baer et al[23] attempted to develop a unifying description of *nervios* across different Hispanic subpopulations using small samples of subjects from 4 different sites in the United States, Mexico, and Guatemala. Their results reveal that the concept of *nervios* is consistent within each sample and that there was approximately a 50% concordance in the definitions of *nervios* across the groups. However, significant variations in the causes, symptoms, and health outcomes associated with the term *nervios* in the 4 samples were also observed. With the understanding that there is still no definitive definition of the symptoms of *nervios,* we found it helpful to conceptualize the syndrome as consisting of a chronic subtype and an acute subtype. Table 1 lists the symptoms of each subtype as reported respectively by Leibowitz et al[13] and Salgado de Snyder et al,[20] together with the symptoms of panic disorder.

There are no reports in the literature on the prevalence of a history of *nervios* or of the relationship between *nervios* and panic disorder and other anxiety states in Hispanics who present with CP that leads to evaluation for CAD. We undertook this descriptive, cross-sectional study to: 1) estimate the prevalence of *nervios* in Hispanic patients referred for thallium stress testing in the nuclear medicine department of a large county hospital; and 2) to determine the interrelationships among *nervios,* classical cardiac CP symptoms as assessed with the Rose Angina Questionnaire

Table 1. Symptoms associated with Chronic *Nervios,*[20] *Ataque de Nervios,*[13,18,21] and Panic Disorder (DSM-IV)[12]*

Chronic *Nervios*†	Ataque de Nervios‡	Panic Disorder
Vomiting throughout pregnancy	Anger	**Shortness of breath**
Gastrointestinal problems	Screamed a lot	**Dizziness or faintness**
Headaches	Broke things	**Palpitations or rapid heart beat**
Backaches	Became aggressive	Trembling or shaking
Lump in throat	Cried	**Sweating**
Chest pains	Felt fear	Choking
Difficulty breathing	Depressed before attack	Nausea or abdominal distress
Pain during urination	Felt nervous	Depersonalization
Pain in the genital area	Depressed after attack	**Numbness or tingling**
Blurry vision	Got hysterical	Hot flashes or chills
Deafness	Suicidal thoughts or attempt	**Chest pain or discomfort**
Loss of sensation	Hit self or others	Fear of dying
Loss of voice	**Fainted**	Fear of going crazy or losing control
Amnesia	**Lost consciousness**	
Heart palpitations		
Dizziness		
Numbness in body		
Blindness		

* Symptoms suggestive of cardiac disease are in boldface.
† Symptoms are listed in rank order according to the proportion of persons with *nervios* who reported the symptom.
‡ Symptoms quoted from the questionnaire items published in reference 13.

(RAQ), and the DSM-IV psychiatric diagnoses that overlap with both *nervios* and cardiac CP.

METHODS

Setting and Patient Sample

The study was carried out in the nuclear medicine department of a large county teaching hospital that provides care to uninsured or underinsured patients. The hospital is part of a county healthcare system that yearly provides primary, secondary, and tertiary care to more than 200,000 uninsured or underinsured residents of a large southwestern metropolitan area. More than 1,000 exercise electrocardiograms, exercise thallium stress tests, and persantine or dobutamine thallium stress tests are performed in the hospital each year, and approximately 80% of the patients tested are either African-American or Hispanic. Seventy percent of the tests are performed in patients referred from the healthcare system's community health centers and the hospital's outpatient clinics, and 30% are performed on hospitalized patients. We included both inpatients and outpatients in our sample because the inpatient testing is performed primarily as part of routine preoperative evaluations of patients with risk profiles similar to those of outpatients.

Patients were eligible for our study if they were 30 years of age or older, Hispanic, and physically able to complete a 30-minute structured interview after their stress test. Potential participants were identified by having a Hispanic surname as recorded in the appointment log or by asking the attending physicians, residents, or nuclear medicine technicians to refer Hispanic patients with whom they interacted to the research staff. The research assistant subsequently confirmed Hispanic ethnicity during the patient interview. The research staff made an effort to interview all eligible patients who presented for testing on a given interview day. On each day's appointment log, the research staff members documented the patients who were and were not interviewed. Consent for participation was obtained before the stress test was carried out, and the interview was conducted after the test was completed.

Measures

Patient demographic data, including age, sex, and ethnicity, were collected from the hospital's computerized appointment system. The reason for referral, baseline blood pressure measured before the stress test began, and results of the cardiac stress test as interpreted by a board-certified nuclear medicine physician were abstracted from the medical records maintained in the nuclear medicine department. The research staff measured the height and weight of each patient before beginning the interview. Additional demographic, social, and medical history data were elicited directly from the patients. This information included: years of education completed; marital status; employment status; country of birth; number of years in the United States; language preference; smoking history; and history of hypertension, diabetes, hypercholesterolemia, and other chronic diseases.

Bilingual research staff members were trained in the use of the instruments that were administered, and patients were given a choice between answering questions in Spanish or English.

Assessment of Anginal Symptoms

The RAQ was used to assess the prevalence of symptoms traditionally interpreted as being anginal in origin.[24] The English and Spanish versions of this instrument, which were included in the Hispanic Health and Nutrition Examination Survey (HHANES), were administered.[4] Patients were classified as having a positive RAQ score according to accepted scoring criteria (ie, if they answered affirmatively to the questions, "Do you ever have pain or discomfort in your chest when you walk rapidly or uphill?" and "Is the pain relieved when you rest or lie down?").

A history of *nervios* was assessed with the Ataque de Nervios Questionnaire developed by Liebowitz et al[13] for use among Puerto Ricans in New York City. The purpose of this questionnaire was to understand the phenomenology of *ataque de nervios* as distinct from panic disorder. An individual is classified as positive for a history of *ataque de nervios* if they answer "Yes" to the question, "Have you ever had an attack of nerves?" Persons who answered "Yes" were then asked a series of structured questions regarding the frequency and duration of attacks and the symptoms experienced during the attacks. The list of symptoms includes both the traditional behavioral and emotional components of *ataque de nervios* and the symptoms associated with the DSM-IV diagnosis of panic disorder. During pilot testing of the instrument, it became clear that some patients experienced the chronic form of *nervios* described by Salgado de Snyder et al,[20] but denied ever having *ataque de nervios.* For this reason, we slightly modified the questionnaire developed by Liebowitz et al[13] to ask first about the chronic form and then about the acute form. This minor modification allowed us to determine if the cardiac symptoms associated with panic disorder were observed both in the chronic and the acute forms of *nervios.*

DMS-IV Psychiatric Disorders Associated with Noncardiac Pain

Panic disorder, generalized anxiety disorder, somatoform disorders, dysthymia, and depression were assessed with the PRIME-MD (Primary Care Evaluation of Mental Disorders) questionnaire.[25–27] This instrument was developed for use by nonpsychiatric health professionals to efficiently and accurately screen and diagnose common mental disorders. Both English and Spanish versions have been validated against as-

sessments made by mental health professionals. Prevalence estimates were obtained with the PRIME-MD and from clinical interviews conducted by mental health professionals, with the Kappa statistic ranging from .60 to .70 for agreement between the survey instrument and the clinical interview. The PRIME-MD has the advantage of allowing accurate diagnosis of conditions in less than 20 minutes, which in previous research studies required lengthy clinical interviews by trained mental health professionals.

Beliefs about the Treatment of Nervios

Because our study was exploratory in nature, we did not include extensive questions about the beliefs participants had regarding the treatment of *nervios.* We did, however, include a question regarding the type of professional to whom they would visit for treatment of this condition.

Statistical Analysis

Social and clinical characteristics and prevalence of each psychological condition were calculated for men and women separately and for the total sample. The frequency of endorsement of each symptom associated with *nervios* was also calculated. The bivariate association between a history of chronic and acute *nervios,* the RAQ score, and each PRIME-MD diagnostic category were assessed using the chi-square test. Additional comparisons were made between the psychological condition, the RAQ score, and the results of the cardiac stress test. Multiple logistic regression analysis was used to identify variables that were independently associated with a negative stress test result. The probability of observed differences between groups occurring by chance alone was calculated with the chi-square test for categorical variables and with the *t* test for continuous variables. Since our study was exploratory, we considered $P \leq .05$ to be significant and did not perform an adjustment for multiple comparisons.

To evaluate the frequency with which individuals who reported having chronic or acute *nervios* endorsed symptoms traditionally associated with CAD (ie, chest pain or discomfort, shortness of breath, diaphoresis), we examined the rank order of individual symptoms. We also examined the distribution of the total number of symptoms that individuals experienced in association with *nervios* and the proportion of those symptoms that could be considered suspicious for CAD.

RESULTS

During the 80-day recruitment period, 213 patients were identified by the research assistants as having a Hispanic surname on the appointment log or by the nuclear medicine staff as being Hispanic. Of these, 126 (59%) completed an interview. The primary reason for nonparticipation was the inability of the research assistant to recruit and interview all of the potentially eligible patients present on a given test day. Most (66%) of the participants were women. On average, the study participants were about 2 years younger than patients who were not surveyed, but they did not differ significantly with regard to gender, inpatient or outpatient status, or reason for referral for cardiac testing. Of the 126 patients surveyed, 12 were interviewed before the chronic *nervios* portion of the assessment was added, and the analysis was restricted to the 114 patients who had data for a history of both chronic and acute *nervios.*

The breakdown of the demographic and social characteristics of the study participants by gender is reported in Table 2. The average age was 57 years, the average educational attainment was less than 8 years, and most participants were married. Although 70% reported being born in a Spanish-speaking country and 75% stated that they preferred to speak Spanish, they had lived in the United States for an average of more than 20 years. Of the 18% born outside the United States or Mexico, no single Spanish-speaking country or US territory was represented by more than 2 persons. Other than educational attainment and employment status, the men and women who participated did not differ significantly in sociodemographic characteristics.

The distribution of cardiovascular risk factors and the results of cardiac stress testing by gender are reported in Table 3. Most patients were obese and had a diagnosis of hypertension. Almost 50% had diagnosed diabetes. Hypercholesterolemia was frequent in men (76%), and less common in women (43%). Twenty-six percent of men reported current smoking, as compared to only 4% of women. More than 70% of the participants had been referred for cardiac stress testing to evaluate CP or an anginal equivalent, such as exertional dyspnea. Significantly more women were referred for cardiac stress testing because of CP than were men. When the reason for testing was dichotomized as an evaluation of CP or an anginal equivalent (ie, shortness of breath, evaluation of progression of CAD) versus all other reasons, there was no relationship between the reason for cardiac stress testing and whether the patient was tested as an inpatient or an outpatient.

The prevalence of PRIME-MD psychiatric diagnoses, chronic and acute *nervios,* and a positive RAQ score (ie, Rose questionnaire angina) among men and women is shown in Figure 1. The prevalence of somatoform disorder and of dysthymia or other depressive disorder was high (37% and 46%, respectively). Both of these conditions were more prevalent in women, although the *P* value for somatoform disorder and dysthymia did not reach the criterion of statistical significance. The prevalence of panic disorder was 2%, and that of major depression, generalized anxiety disorder, and alcohol dependence ranged

Table 2. Demographic characteristics of study participants

	Male (*N*=38)	Female (*N*=76)	Total (*N*=114)	*P*
Mean age (yrs)	55.4 ± 8.3	58.3 ± 9.3	57.2 ± 8.9	NS
Years of education completed (mean)	7.9 ± 4.5	6.2 ± 4.1	6.8 ± 4.3	<.05
Marital status				NS
Married	68.4%	56.6%	50.5%	
Divorced	13.2%	10.5%	11.4%	
Widowed	7.9%	21.1%	16.7%	
Single	10.5%	11.8%	11.4%	
Birth place				NS
United States (US)	28.9%	30.3%	29.8%	
Mexico	52.6%	57.9%	56.1%	
Other Latin country	18.4%	11.8%	14.1%	
Years in US for non-US born (mean)	20.1 ± 12.7	21.0 ± 12.4	20.7 ± 12.5	NS
Prefer speaking Spanish	71.1%	77.8%	75.5%	NS
Employment status				<.01
Employed	55.3%	31.6%	39.5%	
Unemployed	18.4%	23.7%	21.9%	
Other (homemaker, retired, disabled)	26.3%	44.7%	38.5%	

from 12% to 15%. Alcohol dependence was significantly more frequent in men than in women. None of the patients was positive for an eating disorder.

Fifty percent of participants reported a positive history of chronic *nervios,* and the condition was significantly more prevalent among women. Acute *nervios* was much less common and occurred almost exclusively in women. There were no reports of acute *nervios* in the absence of chronic *nervios.* Consequently, in our patient sample, *ataque de nervios* only occurred in a subset of participants who also stated that they "suffered from nerves."

Fifty-nine percent of the participants had Rose questionnaire angina, with only a small difference in prevalence between men and women. Figure 2 reflects the prevalence of PRIME-MD diagnoses and a positive RAQ score in the presence or absence of chronic and acute *nervios.* Somatoform disorder was significantly more common in participants with chronic *nervios,* as compared to those without a history of *nervios.* Dysthymia and generalized anxiety disorder were also more frequent in participants with chronic *nervios* than in those without, but these differences fell short of statistical significance. Similarly, although Rose questionnaire angina was slightly more frequent in participants with chronic *nervios,* the difference did not reach statistical significance. Panic disorder was present in only 3% of participants with a positive history of chronic *nervios* but was diagnosed in 14% of participants with acute *nervios.* Although the prevalence of panic disorder seems relatively low, it is impor-

Table 3. Cardiovascular risk factors and reasons for referral for Persantine Thallium testing

	Male (*N*=38)	Female (*N*=76)	Total (*N*=114)	*P*
Body mass index	30.5 ± 4.7	34.4 ± 8.2	33.1 ± 7.5	<.05
Baseline blood pressure before test initiation				
Systolic (mm Hg)	137.6 ± 22.8	141.2 ± 22.2	140.5 ± 22.4	NS
Diastolic (mm Hg)	76.8 ± 11.9	72.1 ± 15.4	73.6 ± 14.5	NS
Diagnosed hypertension (% yes)	73.7%	78.9%	77.2%	NS
Diagnosed diabetes (% yes)	36.8%	51.3%	46.5%	NS
Diagnosed hypercholesterolemia (% yes)	76.3%	43.4%	54.4%	<.05
Current smoker (% yes)	26.3%	4.1%	11.6%	<.05
Reason for referral for cardiac stress testing				<.05
Evaluation of chest pain or anginal equivalent	60.5%	76.3%	71.1%	
Other*	39.5%	23.7%	28.9%	
Percent with normal cardiac stress test	71.1%	89.5%	83.3%	<.05

* Includes follow-up of other cardiac testing suggestive of coronary artery disease (*N*=18), preoperative screening without cardiac symptoms (*N*=4), risk stratification after myocardial infarction (*N*=1), and a high risk factor burden, such as history of diabetes, hypercholesterolemia, and/or hypertension (*N*=10).
NS = not significant

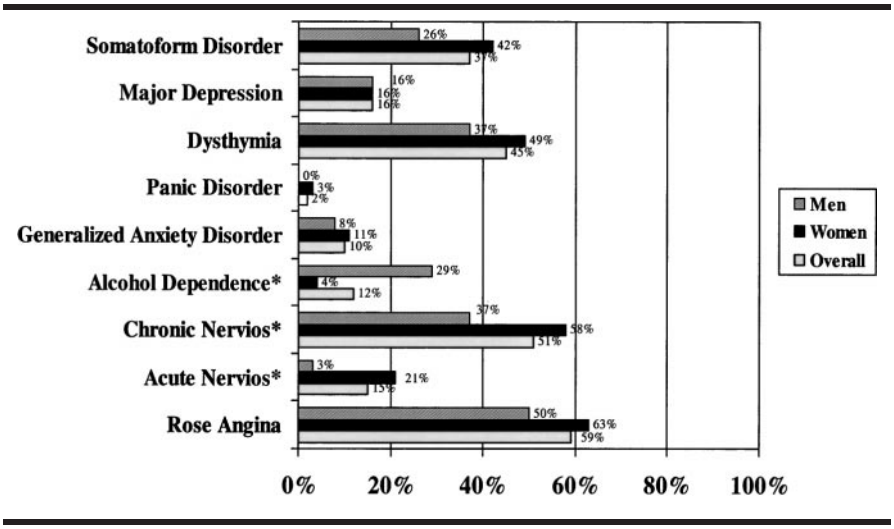

Fig 1. Prevalence of Prime-MD psychiatric diagnoses, *nervios,* and Rose angina in Hispanic men and women referred for cardiac stress testing. The asterisks (*) denote a statistically significant difference at *P*<.05 between men and women

tant to note that panic disorder was not observed among participants who did not also report a history of *nervios.* Rose questionnaire angina was also significantly more common in persons who reported acute *nervios* as compared to those who did not. In our sample, 89% of the participants who stated they had ever had an *ataque de nervios* also had Rose questionnaire angina.

Table 4 shows the frequency with which each symptom of *ataque de nervios* and panic disorder included in the *Ataque de Nervios* Questionnaire was reported to occur with either chronic or acute *nervios.* Emotional components of the syndrome occupied the first 3 ranks in both the chronic and acute forms of *nervios.* In chronic *nervios,* however, symptoms that occur in persons with panic disorder, and might also be related to cardiac ischemia, were ranked fourth through sixth. Forty-four percent of participants who reported having chronic *nervios* and 47% of participants who reported having had an *ataque de nervios* also reported having pain or heat in the chest. With the exception of depersonalization (ie, a sensation of unreality and disassociation from one's body), there appeared to be little difference in the rankings of the various symptoms in chronic versus acute *nervios.*

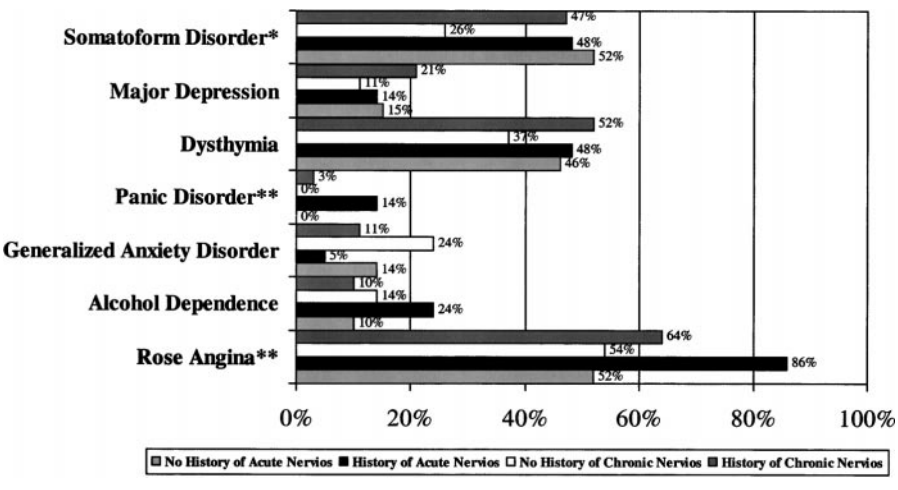

Fig 2. Prevalence of Prime-MD psychiatric diagnoses and Rose angina in persons with and without chronic and acute *nervios.* A single asterisk (*) denotes a statistically significant difference at *P*<.05 for chronic *nervios* only. A double asterisk (**) denotes a statistically significant difference at *P*<.05 for acute *nervios* only

Because of the small number of subjects who reported *ataque de nervios,* we examined the distribution of symptoms within individuals for chronic *nervios* only. The number of symptoms that each individual endorsed ranged from 2 to 24, with a median of 10. When we calculated the number of symptoms possibly consistent with CAD (ie, hot flashes/chills, strong heartbeat, shortness of breath, dizziness, chest pain, numbness/tingling) as a proportion of the total symptoms reported by each individual, we found that, on average, 33% of the symptoms reported in chronic *nervios* were potentially suggestive of CAD; the range was 0% to 67%.

Extensive statistical analysis of predictors of a normal cardiac stress test was not possible because of the relatively small sample size and because of the low probability of a positive test. We did, however, examine the extent to which a positive history of *nervios* and/or Rose questionnaire angina was related to the outcome of the cardiac stress test after taking into account several cardiovascular risk factors and other potential confounders. Table 5 shows the results of 2 logistic regression models; one includes all of the candidate cardiovascular risk factors and the second excludes all of the nonsignificant covariates except age and sex. The variables that remained predictive of the test outcome were inpatient status (test less likely to be normal) and history of chronic *nervios* (test more likely to be normal).

With regard to beliefs about treatment, 76% of participants said they would go to a medical doctor for treat-

Table 4. Rank order of symptoms endorsed by persons with a history of Chronic and Acute *Nervios*

Chronic *Nervios* (*N*=52)*		Acute *Nervios* (*N*=19)*	
Symptoms	***N* (%)**	**Symptoms**	***N* (%)**
1. Nervousness	47 (90%)	1. Crying	17 (89%)
2. Crying	41 (79%)	2. Nervousness	17 (89%)
3. Anger	39 (75%)	3. Depressed/sad 1 or 2 days **after** attack	17 (89%)
4. Hot flashes/chills	36 (69%)	4. Trembling	16 (84%)
5. Strong heartbeat	35 (67%)	5. Felt anger	16 (84%)
6. Shortness of breath/asphyxia	32 (62%)	6. Strong heartbeat	14 (74%)
7. Depressed/sad 1 or 2 days **after** attack	32 (62%)	7. Shortness of breath/asphyxia	14 (74%)
8. Trembling	29 (56%)	8. Got hysterical	14 (74%)
9. Dizziness	26 (50%)	9. Got aggressive	13 (68%)
10. Got hysterical	24 (46%)	10. Screamed a lot	11 (58%)
11. Got aggressive	23 (44%)	11. Felt fear	11 (58%)
12. Felt fear	23 (44%)	12. Hot flashes/chills	11 (58%)
13. Pain/heat in chest	23 (44%)	13. Depersonalization	10 (53%)
14. Numbness/tingling	23 (44%)	14. Feared death	10 (53%)
15. Depressed/sad 1 or 2 days **before** attack	23 (44%)	15. Depressed/sad 1 or 2 days **before** attack	10 (53%)
16. Screamed a lot	22 (43%)	16. Pain/heat in chest	9 (47%)
17. Feared death	16 (31%)	17. Numbness	9 (47%)
18. Feared loss of control	16 (31%)	18. Dizziness	9 (47%)
19. Feared insanity	12 (23%)	19. Feared loss of control	8 (42%)
20. Suicidal thoughts	9 (17%)	20. Feared insanity	7 (37%)
21. Broke things	8 (15%)	21. Broke things	5 (26%)
22. Felt depersonalization	7 (14%)	22. Hit self/others	4 (21%)
23. Fainted	6 (12%)	23. Suicidal thoughts	4 (21%)
24. Hit self/others	5 (10%)	24. Fainted	2 (11%)
25. Lost consciousness	5 (10%)	25. Lost consciousness	1 (11%)
26. Other	3 (5%)	26. Other	2 (11%)

* The total number of participants reporting a history of *nervios* was 58. However, 6 participants did not complete the detailed symptoms component of the chronic *nervios* questionnaire, and 2 participants did not complete the detailed symptoms component of the *ataque de nervios* questionnaire.

Table 5. Multivariate association between selected cardiovascular disease risk factors, Rose Angina Questionnaire (RAQ) Score, and *Nervios* and a normal cardiac stress test result

Dependent Variable Coding (1=normal test, 0=otherwise)	Odds Ratio	95% Confidence Interval	*P*
Model 1—All Candidate Variables			
Age	.97	.92, 1.02	.26
Sex (1=male, 0=female)	.43	.14, 1.37	.15
Outpatient referral (1=yes, 0=no)	.31	.10, 1.0	.05
Referral for chest pain (1=yes, 0=no)	1.10	.35, 3.43	.87
Current smoker (1=no, 0=yes)	5.59	.56, 55.34	.14
Hypertension (1=yes, 0=no)	.51	.13, 2.00	.33
Diabetes (1=yes, 0=no)	.48	.17, 1.39	.18
Hyperlipidemia (1=yes, 0=no)	.73	.25, 2.13	.57
Positive RAQ score (1=yes, 0=no)	1.45	.54, 4.04	.45
Chronic *Nervios* (1=yes, 0=no)	2.95	1.0, 8.74	.05
Model 2—Age, Sex, and Significant Covariates			
Age	.96	.91, 1.01	.13
Sex (1=male, 0=female)	.61	.22, 1.68	.34
Outpatient referral (1=yes, 0=no)	.34	.17, 1.01	.05
Chronic *Nervios* (1=yes, 0=no)	2.97	1.06, 8.32	.04

ment of "nervios," 22% said they would consult a psychiatrist/psychologist, and only 2% said they would seek help from a *curandero* or folk healer.

DISCUSSION

This is the first study of which we are aware that examines the role of *nervios* in the evaluation of CAD in Hispanic patients. We found that a history of the chronic form of *nervios* was reported by 59% of Hispanic patients who presented for cardiac stress testing in our public healthcare system. Although a history of *nervios* was more common in women in our sample, a significant number of men also reported the condition. Although *ataque de nervios* was less common in our study sample, it was still present in a significant proportion of patients. Overall, participants who had chronic *nervios* were not more likely to have Rose questionnaire angina than were those who did not, but the subgroup of participants who reported having had an *ataque de nervios* was highly likely to have Rose questionnaire angina.

Population-based estimates of the prevalence of chronic *nervios* and *ataque de nervios* are scarce. Salgado de Snyder et al,[20] in their random sample of two rural populations in Mexico, found that 21% of females and 10% of males reported a history of chronic *nervios.* Persons who reported having chronic *nervios* were more likely to endorse a variety of somatic symptoms than were those without a history of *nervios.* Although direct comparisons are not possible, it appears that the prevalence of chronic *nervios* observed in patients referred for cardiac stress testing in our setting is much higher than would be expected in a general population sample of Mexican origin. We have not been able to identify reports of the prevalence of chronic *nervios* in other, nonpsychiatric clinical populations.

Population prevalence of *ataque de nervios* has only been reported for residents of the island of Puerto Rico. Guarnaccia et al[17,28] found that 14% of the population reported a lifetime history of at least one *ataque de nervios.* As was true for chronic *nervios* in the Mexican sample, *ataque de nervios* was more common in older participants, participants with lower educational attainment, and unmarried individuals. Sixty-three percent of participants who reported at least one *ataque de nervios* also had one or more psychiatric diagnoses.

Liebowitz and associates have carried out extensive analyses of the relationship between *ataque de nervios* and panic disorder and other anxiety and mood disorders.[13,21,22] They have found a high degree of overlap between symptoms of *ataque de nervios* and panic attacks, as well as between *ataque de nervios* and depression. In the DSM-IV diagnostic system, the diagnosis of panic disorder is made only if panic attacks are of rapid onset and occur unexpectedly without an obvious trigger. Liebowitz et al have found that a hallmark feature of *ataque de nervios* is that it occurs in a social setting and is provoked by a crisis in the individual's personal life. Consequently, most persons who report *ataque de nervios* would not meet the definition of panic disorder, but their symptoms would often be consistent with panic attacks.

Although *nervios* appears to share many features with panic disorder, there is little evidence that the prevalence of these conditions in the US Hispanic population, as defined by DSM-III, DSM-III-R, or DSM-VI diagnostic criteria, is excessively high. The lifetime prevalence of panic disorder and milder panic states was studied in a population survey conducted in Los Angeles.[29] In this sample, panic disorder and phobic states were found to be slightly more common in Mexican-American women over 40 years of age than in non-Hispanic White women in the same age group. There were no ethnic group differences in the prevalence of panic disorder among men in that sample. Although comparisons of the racial/ethnic group differences in the prevalence of depression and other mood disorders based on more recent population data have been published, these studies did not specifically address panic disorder.[30,31]

An important finding in our study was that, despite the high prevalence of nervios *and Rose questionnaire angina, there were only 3 cases (2%) of panic disorder and 16 cases (13%) of generalized anxiety disorder.*

An important finding in our study was that, despite the high prevalence of *nervios* and Rose questionnaire angina, there were only 3 cases (2%) of panic disorder and 16 cases (13%) of generalized anxiety disorder. Consequently, a DSM-IV diagnosis of an anxiety disorder would have little value as a surrogate marker for the cultural syndrome of chronic *nervios.*

The fact that symptoms associated with panic disorder may overlap with those of CAD is widely recognized. Fleet et al[32] reviewed the clinical literature examining the prevalence of panic disorder in patients with CP and calculated an overall prevalence of 30% in persons without documented CAD. Fleet et al[32] pointed out that patients found to have noncardiac CP are frequently not reassured by being told they do not have heart disease and that they continue to experience significant disability. Other psychiatric symptoms, including depressive symptoms and somatization, have been found to have a higher than expected frequency in patients with noncardiac CP.[33–36] Our

study suggests that, in addition to the traditional psychiatric diagnoses found to have a higher prevalence among persons referred for evaluation of CP, a history of *nervios* in Hispanic patients may also result in increased frequency of evaluation for cardiac symptoms.

Our study was not designed to establish the prevalence of *nervios* in a general population sample or in a primary care patient sample, or to determine the relationship between a history of *nervios* and referral for cardiac testing. Rather, the purpose of the study was to determine whether or not *nervios* was present in a sufficiently large number of persons who are referred for stress testing to warrant further research on its role in the evaluation and management of cardiac symptoms among Hispanics. The fact that a positive history of *nervios* increased the likelihood of normal cardiac stress test results suggests that greater cultural awareness of the syndrome among primary care providers and a careful history designed to determine the context and lifetime experience of symptoms of *nervios* could improve clinical decision-making regarding the need for extensive cardiac workups.

Additional research is needed to understand the epidemiology of *nervios* in the general US Hispanic population and in primary care clinic populations, the factors associated with referral for cardiac testing among Hispanics with and without a history of *nervios,* and the utilization of health services after a negative cardiac workup. Our study should not be misinterpreted as suggesting that Hispanics who report a history of *nervios* are less likely to have heart disease than those who do not. Rather, it points to the need for a broader understanding of culturally based definitions of illness and their role in the presentation of disease in US healthcare settings. Since the great majority of our study participants who had *nervios* identified the medical doctor as the professional from whom they would seek treatment for the condition, it is important to educate physicians and other health providers about the characteristics of the syndrome and to develop effective approaches to screen for and counsel patients who report the syndrome.

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