Coronary Heart Disease Mortality and Risk Among Hispanics and Non-Hispanics in Orange County, California

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CORONARY HEART DISEASE (CHD) is the leading cause of death in the United States, as well as in many other highly industrialized countries. Japan, however, is a noteworthy exception (1–3). Various hypotheses have been suggested for the low CHD rates among the Japanese and certain other groups. These hypotheses include the protective in-

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fluence of the cultural milieu, social support mechanisms, and the behavioral and dietary practices associated with particular cultural groups. Yano and associates (3) reported that the degree of acculturation of Japanese men in Hawaii to the Japanese culture was inversely related to the incidence of CHD, a finding which suggests that this non-Western culture affords a protective influence against CHD. Matsumoto (1) hypothesized that the traditional Japanese culture reduces the levels of societal stress. Even in this current age of industrialization, the orientation of the Japanese culture is toward conformity and consensus, rather than toward the competitiveness so common in industrialized nations.

Burkitt (4) has suggested that the absence of fiber in the Western diet

may be associated with CHD and other chronic diseases that are quite prevalent in developed countries, but uncommon in countries where intake of animal protein is low and consumption of dietary fiber is high. Berkman and Syme (5) found that having friends, belonging to organizations, and deriving other forms of social support is related to reduced CHD mortality.

Hispanics in Puerto Rico and in the continental United States also have been reported to have low CHD mortality rates (6–8). Although Hispanics comprise one of the dominant U.S. ethnic minorities, they have not been studied extensively with respect to health phenomena (9). There is a need for additional research into CHD mortality among Hispanics to confirm the low rates observed in pre-

vious investigations and to explore the reasons for the low rates. It is possible that Hispanics may differ from populations at high risk for CHD in a range of psychosocial factors such as motivational orientation toward work and life in general, available social support mechanisms, and stress levels; behavioral variables including smoking, alcohol consumption, and exercise; physiological variables including serum cholesterol, blood pressure, and other known CHD risk factors; and family history of CHD and chronic diseases.

Mexican-Americans apparently relieve stresses through the support of extended family relationships (10). However, Anglos tend not to use family resources in coping with stresses; rather, they seek emotional support from friends, neighbors, co-workers, and groups (10). Such differences in sources of emotional support may influence stress levels that, in turn, could be reflected in differences in rates of chronic diseases such as CHD.

The Orange County Public Health Department in California has a unique opportunity to study Hispanic morbidity and mortality from CHD because of the large numbers of Mexican-Americans concentrated in the county and because health data are routinely available. In the study reported here, the following questions related to CHD in the county were explored.

• Are the CHD mortality rates for Hispanics different from those for non-Hispanics?

• Are the known CHD risk factors for Hispanics different from those for non-Hispanics?
• Do Hispanics have different behavioral practices, stress levels, and motivational orientations toward work and life than non-Hispanics?

Study Methods

Data from two sources were used to study mortality patterns in one analysis and morbidity in a second analysis. Mortality data for all causes and for coronary heart disease were derived from the death certificates filed with the Vital Statistics Division of the Orange County Public Health Department. CHD mortality data were coded according to the International Classification of Diseases, eighth edition, codes 390 through 429 for diseases of the heart, excluding codes 400,

Table 1. Provisional [1] death rates per 100,000 (total deaths), Orange County, Calif., 1978

Age group (years)	Males Non-Hispanic Number	Males Non-Hispanic Rate	Males Hispanic Number	Males Hispanic Rate	Females Non-Hispanic Number	Females Non-Hispanic Rate	Females Hispanic Number	Females Hispanic Rate
0–4	123	240.0	33	297.6	91	186.3	27	255.4
5–14	32	26.6	3	16.1	20	17.4	3	16.8
15–24	178	123.3	27	259.4	70	50.1	6	31.2
25–34	168	122.8	30	184.4	92	67.2	4	24.6
35–44	187	175.6	22	199.1	102	94.6	5	44.7
45–54	482	526.7	23	361.2	285	317.7	10	160.2
55–64	869	1,224.8	25	774.5	568	800.6	11	340.8
65–74	1,151	3,304.2	38	2,918.6	889	1,840.5	23	1,273.5
75 and over	1,827	11,261.8	59	5,344.2	2,434	7,902.3	40	1,908.4
Total	5,017	649.3	260	292.6	4,551	577.5	129	145.9

[1] Rates based upon 1978 deaths recorded through February 1979. These rates represent approximately 95 percent of final totals.

401, and 403. Age-specific death rates were calculated for non-Hispanic and Hispanic males and females for all causes and for diseases of the heart. Population estimates were obtained from a 1976 special census. From the census data, classification as Hispanic was determined by self-identification or by census enumerators' identification (11). From the death certificate data, Hispanic ethnicity was determined by surname.

For the second analysis, data were obtained from pre-employment records of physical examinations of county employees. The county is one of the largest employers in the area. It draws upon a highly diverse group of people in terms of occupational classification and sociocultural background. During 1978, about 1,800 incoming employees were examined. Personnel of a health testing agency that provides contract services to the county administered a questionnaire, which included personal behavior and medical and psychological history, and performed the physical examinations. Nurses collected data on physiological parameters, including a fasting blood sample, blood pressure, heart rate, pulmonary function, chest X-rays, height and weight, and a urine specimen. A physician then reviewed the data and performed the physical examinations.

In addition to the examination records of all Hispanics, a 20-percent sample of the records of non-Hispanics was obtained for the analysis. The two samples yielded data on about 450 Hispanic and non-Hispanic incoming employees. A form was designed for abstracting and coding specific items from the case records, and the following information was collected.

Demographic information: occupa-

Table 2. Provisional death rates per 100,000 (total deaths), Orange County, Calif., 1978, diseases of the heart (ICDA-8, codes 390–429, excluding 400, 401, 403)

Age group (years)	Males Non-Hispanic Number	Males Non-Hispanic Rate	Males Hispanic Number	Males Hispanic Rate	Females Non-Hispanic Number	Females Non-Hispanic Rate	Females Hispanic Number	Females Hispanic Rate
0–4	0	0.0	0	0.0	0	0.0	0	0.0
5–14	0	0.0	0	0.0	1	0.9	0	0.0
15–24	2	1.4	0	0.0	1	0.7	0	0.0
25–34	9	6.6	2	12.3	3	2.2	0	0.0
35–44	46	43.2	0	0.0	6	5.6	0	0.0
45–54	214	233.9	7	109.9	35	39.0	1	16.0
55–64	357	503.2	8	247.8	141	198.7	3	92.9
65–74	478	1,372.2	12	921.7	295	610.7	11	609.1
75 and over	814	5,017.6	27	2,445.7	1,143	3,710.9	20	954.2
Total	1,920	248.5	56	63.0	1,625	206.2	35	39.6

tional status, age, sex, ethnicity, nativity

CHD risk factor information: blood pressure, triglycerides, serum cholesterol, glucose, weight (ponderal index), height

Behavioral characteristics: smoking, alcohol consumption, coffee consumption, level of physical activity at work, participation in physical activities and exercise outside of work

Psychological characteristics: job satisfaction, psychological stress index—18 items indicating reactions to life and job stresses, including concern about health, depression, and anger or irritation

Family history of major chronic diseases: coronary heart disease, diabetes, hypertension, stroke

Table 3. Responses to health questionnaire by non-Hispanic and Hispanic employees of Orange County, Calif., for selected variables

Variable	Men				Women			
	Non-Hispanic		Hispanic		Non-Hispanic		Hispanic	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Occupational status:								
White-collar	71	49.3	37	46.8	137	95.8	85	96.6
Blue-collar	73	50.7	42	53.2	6	4.2	3	3.4
Smoking:								
Never or stopped	84	58.3	48	60.8	97	67.8	72	81.8
Light	36	25.0	27	34.2	28	19.6	15	17.1
Heavy	24	16.7	4	5.1	18	12.6	1	1.1
Alcohol consumption:								
Nondrinkers	31	21.5	28	35.4	41	28.7	29	33.0
Rarely or occasionally	106	73.6	48	60.8	90	62.9	56	63.6
Frequently	7	4.9	3	3.8	12	8.4	3	3.4
Coffee consumption:								
Never	66	45.8	30	38.0	55	38.7	41	46.6
Light	47	32.6	36	45.6	39	27.5	40	45.5
Moderate or heavy	31	21.5	13	16.5	48	33.8	7	8.0
Exercise:								
None or little	78	54.2	46	58.2	96	67.1	66	75.0
Moderate	40	27.8	31	39.2	23	16.1	18	20.5
Frequent	26	18.1	2	2.5	24	16.8	4	4.6
Physical activity at work:								
Sitting	27	18.8	15	19.0	61	42.7	30	34.5
Standing or walking	25	17.4	15	19.0	18	12.6	12	13.8
Heavy manual	44	30.6	28	35.4	7	4.9	6	6.9
Unknown	48	33.3	21	26.6	57	39.9	39	44.8
Job satisfaction:								
Not satisfied	33	22.9	22	27.9	27	18.9	16	18.2
Satisfied	63	43.8	36	45.6	59	41.3	32	36.4
Unknown	48	33.3	21	26.6	57	39.9	40	45.5
Family history of chronic diseases:								
Coronary heart disease	32	22.2	13	16.5	54	37.8	21	23.9
No coronary heart disease	112	77.8	66	83.5	89	62.2	67	76.1
Diabetes:								
Yes	34	23.6	23	29.1	57	39.9	36	40.9
No	110	76.4	56	70.9	86	60.1	52	59.1
Hypertension:								
Yes	45	31.3	27	34.6	61	42.7	38	43.2
No	99	68.8	51	65.4	82	57.3	50	56.8
Stroke:								
Yes	29	20.1	15	19.0	39	27.3	23	26.1
No	115	79.9	64	81.0	104	72.7	65	73.9

Table 4. Mean scores of non-Hispanic and Hispanic employees of Orange County, Calif., for coronary heart disease risk factors

Risk factors	Men		Women	
	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic
Psychological distress index	19.4	19.8	20.6	20.7
Blood pressure, systolic	127.6	126.2	115.7	115.7
Blood pressure, diastolic	76.8	77.8	72.5	72.8
Triglycerides	89.3	113.5	76.5	78.2
Serum cholesterol	206.3	220.8	205.8	201.5
Glucose	99.2	101.8	94.3	93.6
Ponderal index	12.8	12.4	12.8	12.4

Results

Mortality trends. Tables 1 and 2 present the results of the mortality analysis. For all causes of mortality, the rate for Hispanic males was greater than that for non-Hispanics up to the 45–54 age group. For Hispanic females, the death rate was lower than that for non-Hispanics across all age groups except for those 0–4 years. For deaths due to diseases of the heart, the age-specific death rates for both male and female Hispanics at ages 45–54 were lower than those for male and female non-Hispanics.

Risk factor analysis. The results of the study of CHD risk factors among county government employees are shown in tables 3 and 4. Almost equal numbers of Hispanic and non-Hispanic men were in white-collar and blue-collar occupations, whereas women of both ethnic groups were predominantly white-collar workers. With respect to behavioral characteristics, more non-Hispanic men and women than Hispanic men and women were smokers, more non-Hispanic women than Hispanic women consumed alcohol frequently, and more Hispanic men and women than non-Hispanic men and women were nondrinkers. A greater percentage of non-Hispanic men and women than Hispanic men and women were moderate or heavy coffee consumers. Non-Hispanic men and women were more likely than Hispanics to exercise recrea-tionally; however, there was little difference between the two groups in physical activity at work. With respect to job satisfaction, the majority of both groups reported being satisfied with their occupations.

The mean scores on CHD risk factors (table 4) indicate no difference between the two groups on the psychological stress index. Also, both groups tended to have similar systolic and diastolic blood pressures. Hispanic men had the highest triglyceride, serum cholesterol, and glucose levels. The ponderal index scores were equal for the men and women in both groups. The non-Hispanic men and women, as expected from the results of the mortality study, reported a positive family history of coronary heart disease more frequently than the Hispanic men and women. The percentage distribution for diabetes, hypertension, and stroke showed little variation for both groups.

Conclusion

Our findings are consonant with those of other studies of mortality from coronary heart disease among Hispanics and non-Hispanics. Although in Orange County the Hispanic CHD death rates were substantially lower than those for non-Hispanics, our findings concerning CHD risk factors at present do not provide any insight into the mortality findings. We found some evidence that Hispanics are less likely than non-Hispanics to engage in vigorous physical activities outside of work, but we saw no differences between the two groups with respect to job satisfaction and psychological stress. Because the Hispanics we studied had lower CHD mortality rates than non-Hispanics, we believe that further investigations are needed to determine the reasons for the mortality differences.

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