Prevalence Rate Of Hypertension Among Recent Southeast Asian Refugees To Northern California

Jeffrey L. Tanji, MD, Jose A. Arevalo, MD, Mary Palieschеskey, Linda Lee, and Oscar Alcalde

Background: **Little is known regarding the prevalence rate of hypertension among recent Southeast Asian refugees to the United States.**

Methods: **In this randomized, prospective study, four northern California counties with large Southeast Asian refugee populations were screened for the prevalence rates of hypertension and borderline hypertension. A population density method based upon 1988 census data was used to screen a representative sample of subjects from each county. Criteria for hypertension came from the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure.**

Results: **In all, 964 subjects were screened. We found a prevalence rate of 4.8 percent for hypertension and 10.9 percent for borderline hypertension.**

Conclusions: **The relatively low prevalence rates of this disease can be explained by the youth of this refugee population, mean age 37.6 ± 0.36 years, as the presence of hypertension increases with chronological age. (J Am Board Fam Pract 1994; 7:105-9.)**

Hypertension is a widespread disease affecting an estimated 58 million persons in the United States.[1] It is a known risk factor for cardiovascular morbidity, mortality, and stroke.[2] Because coronary artery disease remains the leading cause of death in the adult US population, studies that address both the assessment and reduction of cardiovascular risk are relevant and important. Recent immigration of Southeast Asian refugees culminated in an estimated total of more than 1 million new settlers to the United States as of 1990,[3] with the majority of these individuals settling in California. Because of various language barriers, issues of unemployment, and the trauma of relocation, access to health care and the consequent establishment of a medical data base have been major problems for these settlers.[4-6] Little is known about the prevalence rates of diseases common to Southeast Asian refugees.[7-10]

Numerous case reports have described unexplained, sudden nocturnal death as a disease specific to these recent immigrants.[11-16] The Centers for Disease Control received reports of 121 cases of this condition, termed *sudden unexplained death syndrome* (SUDS), among Southeast Asian refugees between 1981 and 1986 that met specific diagnostic criteria.[16] While the number of reported cases of SUDS has steadily declined since its peak in 1981, one large case series pointed to a cardiac pathophysiological mechanism. Both cardiomegaly and conduction abnormalities were found on postmortem pathologic examinations.[11]

Given the notable occurrence of SUDS in this population, an analysis of cardiovascular risk factors, such as hypertension, is needed. The prevalence rate of hypertension in this population is not known. Previous studies have documented an overall hypertension prevalence rate 20.1 percent for Asians and Pacific Islanders and 24.5 percent for Filipinos living in California.[17] In another study Chen, et al.,[18] analyzing a convenience sample of 397 Southeast Asian immigrants to central Ohio, determined the prevalence rate for hypertension to be 17 percent in this population. In our study, we measured the prevalence rates of hypertension among a randomly selected population of recent Southeast Asian refugees in four counties in northern California.

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From the Department of Family Practice, University of California, Davis. Address reprint requests to Jeffrey L. Tanji, MD, Department of Family Practice, UC Davis Medical Center, 2221 Stockton Boulevard, Sacramento, CA 95817.

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Methods

Subjects

Our subjects were men and women, aged 25 to 64 years, of Southeast Asian descent who had immigrated from Cambodia, Laos, or Vietnam from 1988 to 1991. The sample population was randomly selected from two sources: (1) from a master data list of refugees held by the Department of Health Services, State of California (Tuberculosis Control and Refugee Health) for Merced and Stanislaus counties; and (2) from data lists in San Joaquin and Sacramento counties held at each individual county. Individual records were randomly selected for inclusion using a standard random number table. The sample size was based upon the relative density of Southeast Asian immigrants in each county from 1988 census data. This method allowed a systematic sample of recent refugees to represent areas of relatively high or low population density among the four counties studied. The rationale for the selection of the four northern California counties was twofold. One, the population density of Southeast Asian refugees in these communities was relatively high, and two, each county was a site of a Family Practice Residency Program Affiliate of the University of California, Davis. Each residency site coordinated the selection process from the randomized list of subjects. The survey team consisted of 3 trained researchers who organized data collection within each county.

Human Subjects Review Committee approval was obtained from both the University of California, Davis, and the Office of Statewide Health Planning, Department of Health Services, State of California.

Procedures

The definition for hypertension was obtained from standard American Heart Association[19] and Joint National Committee on the Detection, Evaluation and Treatment of High Blood Pressure criteria.[20] By these standards hypertension is defined as three independent measurements of blood pressure in excess of 140 mmHg systolic or 90 mmHg diastolic pressure. The definition of borderline hypertension was based upon the standardized methodology of the Tecumseh Blood Pressure Study.[21] This definition is as follows:

1. One blood pressure measurement in excess of 140 mmHg systolic or 90 mmHg diastolic
2. The average of two blood pressure readings between 140 and 150 mmHg systolic or 90 to 95 mmHg diastolic

After randomization and selection of the study sample, data collection of blood pressure values on all subjects was obtained using three methods. All subjects on entry to their respective county were required to have their blood pressure measured and recorded as a part of an initial health screening data base, the Refugee Health Assessment Form (RHAF). The RHAF is a standardized form developed by the Office of Tuberculosis Control and Refugee Health, Department of Health Services, State of California.* Upon entry to the county, each refugee must file an RHAF with the assistance of a public health nurse (and translator, if necessary). The content of the RHAF consists of personal identification, a file number, date of birth, date of arrival in the United States, country of birth, self-assessed ethnicity, primary language spoken, number of clinic and home visits made, history and physical examination data, tuberculin test (PPD) result, urinalysis values, chest radiograph (if indicated) findings, hepatitis B screening values, and blood pressure readings. The immunization status, dental status, and need for prophylaxis for tuberculosis and hepatitis were ascertained as well. All blood pressure measurements were obtained primarily by 1 trained public health nurse in each county, minimizing intraobserver variability.

A search of the current medical record for each subject was made at the county health clinic where Southeast Asian refugees received follow-up medical care. An additional set of blood pressure values was obtained using this method. In Merced and Stanislaus counties, if chart data were not available for a subject, that subject was contacted by telephone or mail and asked to come to the respective county health clinic for a blood pressure measurement. Intraobserver reliability testing was done for study personnel at a 1-day session held at the UC Davis Medical Center. If the subject was not available for direct measurement of blood pressure, and no chart was available as a part of an ongoing medical data base, then data from the RHAF were used.

*Department of Health Services, P.O. Box 942732, 714/744 P St., Sacramento, CA 94234-7320.

Table 1. Prevalence Rate (%) of Hypertension and Borderline Hypertension by Sex and Age Group (n = 964).

	Hypertension			Borderline Hypertension		
Age	No. Males	No. Females	No. Overall	No. Males	No. Females	No. Overall
25–34 years	7 (3.4)	0 (0.0)	7 (0.7)	20 (9.7)	12 (5.6)	22 (2.3)
35–44 years	4 (3.0)	2 (1.5)	6 (0.6)	18 (10.7)	14 (13.4)	32 (3.3)
45–54 years	8 (11.3)	3 (3.8)	11 (1.1)	16 (22.5)	12 (15.2)	28 (2.9)
55–64 years	13 (21.3)	10 (15.2)	23 (2.4)	14 (23.0)	9 (13.6)	23 (2.4)
		Total	47 (4.8)		Total	105 (10.9)

Data were collected and entered into Paradox 3.5, a relational data base program.[22]

Statistical Methods

Descriptive statistics (prevalence data) were calculated using the Parastat program, a statistical package for Paradox.[22]

Results

Data collection was performed on a total of 964 subjects, randomly selected from four northern California counties, based upon a population density methodology. The prevalence of hypertension in this group was 4.8 percent. Borderline hypertension was present in an additional 10.9 percent of subjects (Table 1).

The mean age of the population was 37.6 ± 0.36 years, and the sex distribution was 49.2 percent men and 50.8 percent women. Racially, the group was divided into several subpopulations consisting of Hmong, Laotian, Mien, and Cambodian (Table 2).

The hypertension and borderline hypertension prevalence data were stratified by age and sex (Figures 1 and 2).

Geographically the data were stratified by county. The largest number of subjects resided in San Joaquin County (n = 399), the second largest subject grouping was in Sacramento County (n = 324), the third largest community was Merced County (n = 135), and the fourth largest geographical area was Stanislaus County (n = 106).

Cardiovascular risk factors in addition to hypertension are presented in Table 3.

Discussion

The prevalence rate of hypertension among recent Southeast Asian refugees who relocated to northern California in this randomized study is less than expected compared with the overall prevalence rate of hypertension among the US population (about 20 percent). These findings, however, are comparable with findings from a previous nonrandomized study by Chen, et al.,[18] who surveyed a population of 397 Southeast Asians in Franklin County, Ohio, and found a single measurement prevalence rate of high blood pressure of 17 percent (compared with 22 percent of historical Ohio statewide controls).

The finding that hypertension occurs less frequently in Southeast Asian refugees than in the US population is surprising given the prevalence rate of hypertension among Japanese men residing in Japan, Honolulu, and northern California.[23] The expectation was that the prevalence of hypertension in this population ought to exceed rather than be less than that in the US population.

The explanations for the relative paucity of hypertension among recent Southeast Asian refugees are several. Generally, most refugees entering the United States are young, regardless of ethnicity and country of origin. Indeed, the mean age of this study group was 37.6 years. The prevalence of hypertension increases linearly with age, so it is not unexpected that a prevalence rate for hypertension was 4.8 percent in this relatively young population. That borderline hypertension occurred in 10.9 percent of this sample, coupled with findings that nearly all those with borderline hypertension have true hypertension with time, hints that the future prevalence rate of hyperten-

Table 2. Distribution of Ethnicity among 964 Subjects.

Ethnic Groups	Number	Percent
Cambodian	112	11.62
Hmong	406	42.12
Laotian	325	33.71
Mien	121	12.55

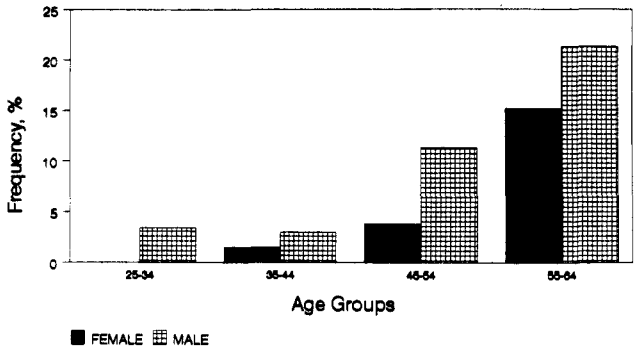

Figure 1. Prevalence rates of hypertension among male and female Southeast Asian refugees.

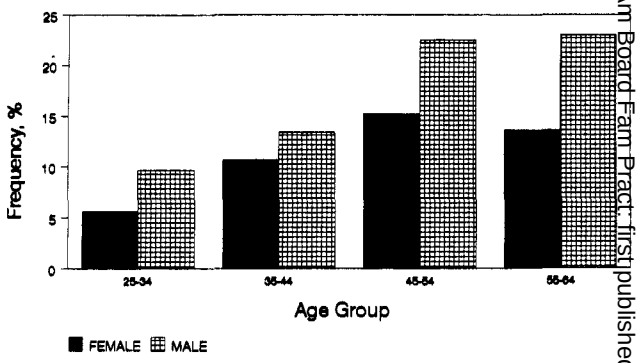

Figure 2. Prevalence rates of borderline hypertension among male and female Southeast Asian refugees.

sion for these persons would approach 16.9 percent. Acculturation of these individuals from a heritage of relatively low cardiovascular risk (low body weight, low-fat diets) to the US culture could also explain the relatively low finding of hypertension. These subjects were studied 1 to 4 years after they had entered the United States. Studies on acculturation, defined in this case as the cultural change from a traditional Southeast Asian to an US lifestyle, have suggested a relation between such change and an increased risk of cardiovascular disease.[24] As this cultural adaptation ensues with time, Southeast Asian dietary patterns (low fat, high fiber) and physical activity levels (relatively high) should reflect closer similarities to typical US patterns[25,26] of a high-fat (40 percent of calories from fat) and sedentary lifestyle (60 percent prevalence rate).

Indirect validation for two of these assertions is reflected in the data base, which shows a mean age of 37.6 ± 0.36 years and a mean weight of 57.8 kg for men and 52.1 kg for women in the study populations. We did not collect data on physical activity or dietary intake.

One of the strengths of the study is its size: this investigation was the first large, multicounty randomized study for determining the prevalence rate of hypertension among Southeast Asian refugees. The randomization process, while time consuming, was believed to reflect adequately the Southeast Asian population of northern California. The nearly equal proportion of men and women in the study further validates the randomization process.

Limitations of this study include the potential for sampling bias. This bias was minimized by drawing the randomized group from four counties and issuing a population density model to reflect the proper proportion of Southeast Asian refugees among the four counties. Evidence that this sample was valid can be indirectly drawn from the even match of men and women in the study, the respective mix of Cambodian, Hmong, Laotian, and Mien ethnic groups, and the overall mean age

Table 3. Southeast Asian Cardiovascular Risk Factors (n = 964).

	Yes	No	Unknown
Risk Factors	No. (%)	No. (%)	No. (%)
Smoking	139 (14.4)	347 (36.0)	478 (49.6)
Diabetes	7 (0.7)	489 (50.7)	468 (48.6)
High cholesterol levels	3 (0.3)	465 (48.2)	496 (51.5)
High blood pressure	14 (1.5)	456 (47.3)	494 (51.2)
Blood pressure medication	5 (0.5)	446 (46.3)	513 (53.3)
Family history of heart disease	9 (0.9)	478 (49.6)	477 (49.5)

of the sample, which reflected the population of Southeast Asian refugees in northern California.

It is important not to draw an association between the findings of the prevalence of hypertension in this study and the diagnosis of sudden unexplained death syndrome. Although SUDS might be associated with cardiomegaly, and although long-term hypertension is directly related to left ventricular hypertrophy, these findings do not suggest a correlation between the two diseases. The mention of SUDS, however, was made to highlight the relevance of cardiovascular research in this population.

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