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Prevalence and Characteristics Associated with Self-Reported Gall Bladder Disease in Mexican American Elders: Results from the Hispanic Established Populations for Epidemiologic Studies in the Elderly (H-EPESE) Study

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Abstract

BACKGROUND & AIMS—To identify the prevalence and characteristics of gall bladder disease (GBD) that has been self-reported in Mexican American Elders.

METHODS—A prospective survey of a regional probability sample of self identified Mexican Americans aged 65 and over. The Hispanic Established Population for the Epidemiologic Studies of the Elderly (H-EPESE), a probability sample of non-institutionalized, Mexican Americans, aged 65 and over, residing in Southwestern states of Texas, New Mexico, Colorado, Arizona, and California.

In 1993–1994 (Wave 1), 3,050 Mexican Americans, aged 65 and over, were selected at baseline as a weighted probability sample. In 1995–1996 (Wave 2), 2,895 remained. Sample weights were used to extrapolate to the estimated 498,176 older Mexican Americans residing in the Southwest United States. Self-reported GBD was collected via in home interviews.

RESULTS—The prevalence of self-reported GBD in Mexican American elders was found to be 18.8% with an average age of 75.05 years. The findings indicate that older Mexican Americans have an increased rate of gallbladder disease if they are female, have history of arthritis or hypertension and have more acculturation to the United States. However, the rate decreases when they score poorly on the Mini Mental State Exam. One major limitation was reliance on self report, as gallbladder disease and other co-morbid illnesses may be under, or over estimated.

CONCLUSIONS—Age is not protective in the prevalence of GBD in elder Mexican Americans. Persistent underlying genetics and dietary habits most likely attribute to this consistent high percentage, even in the elderly.

INTRODUCTION

Gallbladder disease (GBD) is a major cause of morbidity and mortality among the general population in the United States. Biliary stone disease accounts for at least 2.5 percent of health care expenditures, approximately \$5 billion dollars annually (1). Gallbladder disease is also more significant among individuals of Mexican origin, especially among women (2). It has been estimated that 17 percent of Mexican Americans under the age of 65 have GBD, when compared to Non-Hispanic Whites and African-Americans at eight to ten percent (3).

Several studies have found a GBD susceptibility loci on Chromosome 1 in Mexican Americans (4), more specifically the HLA-B39 allele detected from Amerindian ancestry (5). However, there may also be significant social and economic factors influencing the rate of GBD among Mexican Americans. Income below the poverty level and low education may be predisposing this ethnic group to the development of GBD (6).

Despite research determining the overall prevalence and risk factors for GBD, no single study has evaluated the prevalence and characteristics associated with GBD in older Mexican Americans to date. The purpose of this study is to identify the prevalence and characteristics associated with self-reported gall bladder disease in older Mexican Americans.

METHODS

Sample

The data employed in this study is from the Hispanic Established Populations for the Epidemiologic Study of the Elderly (H-EPESE). This ongoing population-based study began in 1993, is funded by the National Institute on Aging, and currently in its sixth wave. The study consists of 3,050 self-identified Mexican Americans, between the ages 65–99 residing in the five southwestern states of Texas, New Mexico, Colorado, Arizona, and California. A follow-up is conducted every 2 years, in order to examine the varying predictors of mortality, changes in health outcomes, changes regarding institutionalization and other living arrangements, and changes affecting overall quality of life. Wave II was collected in 1995–1996 and is the focus of this study. Sampling and data collection methods are detailed elsewhere (7).

Measures

Subjects who reported having been diagnosed by a physician with gallbladder disease were considered to have the disease. “Self-reported” physician diagnosed gallbladder disease is a commonly used epidemiologic measure (8,9,10).

Socio-demographic Factors—Age, gender, living, educational attainment and living arrangements were all gathered by self-report. As most older Mexican Americans have only a few years of education, the variable was dichotomized into those with educational attainment of 0–7 years and those with 8+ years which approaches the median split. In a similar manner, self reported annual income was categorized into those with ≤ \$9,000.

Cognitive Status—Cognitive status was assessed using the Mini Mental State Examination (MMSE). The MMSE is a validated screening instrument that assesses the cognitive domains of orientation, registration, recall, attention, calculation, and language abilities. Presence of probable cognitive impairment was based on the standard cut point of MMSE < 24 points (11).

Co-morbid illness—Co-morbid illnesses were assessed with a self reported condition checklist used previously in the H-EPESE studies. The major disease states listed were those defined by the National Center for Health Statistics as the leading causes of death in the United States, with the exception of hypertension which we added due to impact on the Mexican American Population (12). The group means for the sum of six common co-morbid conditions were calculated to quantify the overall burden of the co-morbid illnesses (13).

Other Symptoms—Symptomatic characteristics for chest pain, chest discomfort, pressure and heaviness were quantified if experienced 'within the last 2 years' or 'not'.

Body Mass Index (BMI)—Height (to the nearest inch) and weight (to the nearest pound) were recorded for each subject. A subject's body mass index (BMI) was then calculated by converting height to centimeters and the weight to kilograms. BMI was categorized into three groups to reflect the usual clinical divisions between normal and overweight or obese.

Activities of Daily Living (ADLs) / Instrumental Activities of Daily Living (IADLs)—ADL function, the core of functional evaluation, was assessed through the modified Katz questionnaire, which has been extensively used in the EPESE projects and is currently in use in the Framingham study (14,15). A validated, Spanish version of ADLs was used in the Hispanic Health & Nutrition Examination Survey as well as in the H-EPESE study. IADL function, an important parameter in community dwelling elder samples, was assessed using the modified OARS questions/scale (16). This is a well-validated, practical scale that also has predictive validity when assessed against mortality. IADLs have also shown to be helpful in evaluating function over time. Green et al. reported 2.06 (+ 3.27 points) annual change using the Instrumental Activities of Daily Living Scale in 104 patients followed up to 18 months (17,18). IADLs were also assessed using the Rosow-Breslau scale (19). Decline in function was measured by the addition of one dependent IADL over time.

Physical Activity Scale for the Elderly (PASE)—The PASE is a brief, easily administered survey designed specifically to assess the physical activity, including household activities, in epidemiologic studies of elders aged 65 years and over. The creators of the PASE established set weights for each activity. The overall score is a summation of each activity multiplied by its weight and its frequency. Higher scores correlate with higher levels of physical activity. The actual PASE score was used in the analysis (20).

Modified Performance Oriented Mobility Test (POMA)—Balance and gait were evaluated using the modified Tinetti's POMA, which has been employed by the H-EPESE and has demonstrated reliability to change over time (21,22). Tandem stands, single leg stands, etc. were used to measure balance and a timed walk was used to measure gait. These measures serve as better predictors of subsequent disability, mortality and long term care admissions than do upper body measures (23,24). Subjects are dichotomized into those in the upper one third of the range 0–4 versus those who performed in the lower two thirds in order to create a median divide.

Cultural Variables—Language of interview was dichotomized into 'English or Spanish'. Likewise, country of birth was also dichotomized as 'United States or Mexico'.

Tobacco and Alcohol Use—Smoking and alcohol intake was ascertained by a subject's recall history of beer, wine, liquor, and cigarette frequency. Smoking and Alcohol use is dichotomized into 'no usage within the past year' versus 'any usage within the past year'.

Statistical Analysis

The data were analyzed using the complex sample survey weights and compiled into descriptive statistics, simple two way cross classification tables and the results of a series of logistic regressions. A cross tabulations table featuring Odds Ratios, their corresponding 95% Confidence Intervals, and p values from Pearson chi-square tests were constructed (Table 1). This was to determine a significant association in characteristics between subjects who reporting gallbladder problems and those who did not. Patient characteristics with p values of 0.25 or less were selected into the starting model of a series of logistic regressions to determine the likelihood of reporting any gallbladder problems. The least significant characteristic was discarded and the logistic model was retested using a backwards elimination strategy until the remaining terms had a p value of 0.05 or less. Respondent's age and sex were retained in all logistic regression models in order to adjust for these influences. All statistical analysis was done using STATA SE v8.2 programs.

RESULTS

The characteristics of the older Mexican Americans with GBD are shown in Table 1. The overall gallbladder disease prevalence was 18.8 percent. Subjects with GBD were older (75.8 years) and overwhelmingly female (73.5%).

Significant factors in the uni-variate analysis were then included in a logistic regression model with the exception of obesity and hypertension (results shown in Table 2). Although obesity was slightly non significant, it was retained in the model over the slightly significant hypertension variable due to its clinical significance.

Subjects who interviewed in English were 1.8 times as likely to have GBD. Women (OR=2.3) and those reporting arthritis (OR=1.7) were also more likely to report GBD.

DISCUSSION

This is the first study to examine the prevalence and characteristics associated with gallbladder disease in a community based elder sample of Mexican Americans. The prevalence of self-reported GBD in Mexican American elders was found to be 18.8%. This corresponds with previous statistics seen in younger Mexican American populations compared to Non-Hispanic Whites and African-Americans at 8–10%. Therefore, persistent underlying genetics and dietary habits probably attribute to this consistent high percentage of GBD into old age in the Mexican American population.

Interestingly, the measure of effect in our Mexican American elder population implies a 2 percent GBD risk for every year above the mean age. Thus, an age increase of ten years can confer to a 20 percent increase in GBD risk in the older members of our cohort. Therefore, GBD still remains a significant medical problem in this minority population.

The association of GBD in subjects who interviewed in English is an interesting finding. Everhart and colleagues found a higher incidence of GBD in more acculturated Mexican Americans (2). This may indicate a more direct link to an adoption of the American diet and lifestyle leading to increased incidence of gallbladder disease. Further research is clearly needed.

Higher rates of older Mexican American females reporting gallbladder disease was expected. The association between GBD and arthritis was significant. This may be attributable to the body's inflammatory reaction to disease in general, predisposing those subjects with arthritis to GBD. There is a clinical correlation between arthritis and obesity

with arthritis being a sequelae of obesity. Thus arthritis, rather than obesity remained as correlates after adjustment for age and sex in this older cohort.

Limitations

Reliance on self reported gallbladder disease and other co-morbid illness limits the ability for these results to be generalized. The nature of self-reported morbidity trends in epidemiologic studies towards underreporting so the incidence of GBD may be much larger in the older Mexican origin population. Additionally, the quality of self reported clinical variables in large multi-state epidemiologic studies must be examined with the understanding that the validation of these variables is often impossible due to geographic and resource limitations. The NHANES III study, which included Mexican Americans, reported that in addition to those who provided self-reported gallbladder disease, between six and eight percent of participants actually had silent gallbladder disease (25). The rate in our population may be in this range, though more studies are clearly needed.

CONCLUSIONS

Gallbladder disease is a commonly recognized medical problem in younger Mexican Americans. However, to date, evidence on the prevalence of GBD in older Mexican Americans and the characteristics associated with the disease process has been absent. Results of this study suggest that elder Mexican American populations carry the same prevalence of GBD as younger cohorts with the disparity potentially being greater due to underreporting bias. Persistent underlying genetics and dietary habits may attribute to this consistent high percentage but further research is needed.

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Table 1

Demographic and Study Variables of Older Mexican Americans with Self- Reported GBD. *Hispanic EPESE (weighted estimates).*

Any Gallbladder Problems	None-1970 (313687) 81.2%	Yes-460 (72583) 18.8%	Odds Ratio & Confidence Interval	P Value
Mean Age	74.9	75.8	1.02 (1.001 – 1.04)	0.04
Sex				
females	53.6%	73.59%	2.42 (1.75 – 3.34)	<0.001
males	46.5%	26.41%		
Arthritis	40.9%	64.2%	2.59 (1.96 – 3.40)	<0.001
Hypertension	42.2%	57.2%	1.83 (1.35 – 2.49)	<0.001
Coronary or MI	10.3%	12.1%	1.2 (0.73 – 1.95)	0.47
Stroke	10.0%	18.1%	2.0 (1.21 – 3.28)	0.007
Cancer	6.5%	10.8%	1.73 (1.1 – 2.73)	0.019
Diabetes	25.5%	33.2%	1.45 (1.12 – 1.87)	0.005
Mean of 6 co morbidities	1.35	1.95	1.51 (1.35 – 1.70)	<0.001
Any of 6 co morbidities	73.7%	87.5%	2.49 (1.71 – 3.64)	<0.001
Household Income <\$9k	52.6%	49.4%	0.84 (0.45 – 1.59)	0.60
MMSE < 24	50.9%	41.8%	0.69 (0.53 – 0.91)	0.009
Depression	11.2%	22.0%	2.23 (1.56 – 3.17)	<0.001
Any IADL	52.9%	63.1%	1.5 (1.17 – 1.98)	0.002
Any ADL	13.8%	23.0%	1.86 (1.23 – 2.81)	0.003
BMI				
overweight	39.2%	35.7%	1.21 (0.81 – 1.81)	0.360
obese	29.2%	40.3%	1.83 (1.25 – 2.66)	0.002
Health				
Fair or Poor	56.7%	67.4%	1.58 (1.19 – 2.1)	0.002
Interview in English	20.7%	35.4%	2.11 (1.49 – 3.0)	<0.001
Mean MD visits Past 12 months	7.52	11.75	1.01 (1.001 – 1.011)	0.010
Less than 8 th grade	82.6%	77.5%	0.72 (0.49 – 1.07)	0.11
Chest pain or discomfort	23.2%	34.9%	1.78 (1.27 – 2.48)	0.001
Chest pressure or heaviness	20.0%	32.5%	1.02 (1.44 – 2.55)	<0.001
Chest pain or discomfort in past 2 years	77.5%	80.7%	1.21 (0.64 – 1.31)	0.59
Chest pressure or heaviness in past 2 years	73.0%	80.5%	1.53 (0.81 – 2.86)	0.186
High cholesterol	16.0%	26.2%	1.87 (1.38 – 2.54)	<0.001
Osteoporosis	3.2%	7.3%	2.39 (1.02 – 5.57)	0.044
Liver disease	1.9%	6.4%	3.54 (1.93 – 6.51)	<0.001
Hospitalized for illness or injury	19.9%	31.8%	1.87 (1.40 – 2.49)	<0.001
Mean Physical Activity Scale Elderly (PASE)	136.2	142.0	1.002 (0.99 – 1.01)	0.102

Any Gallbladder Problems	None-1970 (313687) 81.2%	Yes-460 (72583) 18.8%	Odds Ratio & Confidence Interval	P Value
POMA Upper 1/3 range	53.8%	41.8%	0.62 (0.45 – 0.85)	0.003
Smoke cigarettes now	11.4%	9.4%	0.81 (0.53 – 1.22)	0.308
Alcohol in past year	17.5%	15.7%	0.88 (0.57 – 1.35)	0.546
% of Lifetime spent in U.S.	54.6%	57.7%	1.001 (0.9 – 1.0)	0.77
Spanish vs. English usage	42.2	37.3	0.96 (0.92 – 0.997)	0.035
% Weight change time 1 – 2	–0.003	0.002	1.72 (0.49 – 6.06)	0.39
Born in U.S.A.	52.9%	56.6%	1.16 (0.84 – 1.61)	0.91

Table 2

Logistic Regression Model of the Factors Associated with Self Reported GBD

	Odds Ratio & Confidence Interval	P Value
Mean Age *	1.02 (0.99 – 1.05)	0.18
Sex * (Females)	2.31 (1.64 – 3.26)	<0.001
Obesity *	1.4 (0.97 – 2.82)	0.74
Arthritis	1.76 (1.33 – 2.33)	<0.001
Interview in English	1.84 (1.2 – 2.82)	0.005
Mean MD visits Past 12 months	1.01 (1.002 – 1.02)	0.013
Chest pain or discomfort	1.61 (1.05 – 2.47)	0.028

* Retained in the model