Original article

Ethnicity and alcohol consumption among US adults with diabetes

Patrice A.C. Vaeth DrPH [a,b,*], Raul Caetano MD, PhD [c], Eva M. Durazo MPH [a,b]

[a] Prevention Research Center, Oakland, CA
[b] Pacific Institute for Research and Evaluation, Calverton, MD
[c] University of Texas School of Public Health, Dallas Regional Campus, Dallas

ABSTRACT

Purpose: The drinking practices of a nationally representative sample of white, black, Mexican American, and other Hispanic adult diabetics are described and compared.
Methods: Combined years (2005/2006—2011/2012) of the National Health and Nutrition Examination Survey provided home interview data from 2220 adults with self-reported diabetes of white ($n = 875$), black ($n = 720$), Mexican American ($n = 402$), and other Hispanic ($n = 223$) ethnicity. Current drinking status, the number of drinks consumed per week, and binge drinking were compared across ethnicity.
Results: The multivariate findings for both diabetic men and women showed no statistically significant ethnic differences in current drinking status, and among women, there were no statistically significant ethnic differences in binge drinking. Among male diabetics, Mexican Americans consumed more drinks per week than whites ($b = 0.35$; 95% confidence interval, 0.13—0.58; $P = .002$) and were at increased risk for binge drinking (odds ratio, 2.04; 95% confidence interval, 1.30—3.21; $P = .002$).
Conclusions: Binge drinking is prevalent among Mexican American male diabetics. This pattern of drinking may put them at risk for poor diabetes management and control. It is important that health care providers routinely assess their patients' drinking practices and address the health risks associated with alcohol consumption.

© 2014 Elsevier Inc. All rights reserved.

Introduction

Diabetes is a devastating disease that disproportionally affects many minority groups relative to whites [1—3]. Existing research indicates that alcohol consumption may impact diabetes management and control [4—7]. Little is known, however, about the drinking practices of those with diabetes and particularly, how this varies in relation to ethnicity. This is important to assess because US general population studies have documented significant differences across ethnicity in both the patterns of alcohol consumption and its adverse effects [8—16]. For example, among men, whites and Hispanics were more likely than blacks to be current drinkers, but blacks were more likely than whites and Hispanics to be daily heavy drinkers ($\geq$5 drinks/d). White women were also more likely to be current drinkers compared with Hispanic and black women. Black and white women were more likely than Hispanic women to be daily heavy drinkers ($\geq$4 drinks/d) [10]. There is also heterogeneity in drinking among US Hispanics. Mexican Americans and Puerto Ricans were more likely to be current drinkers, had higher weekly consumption levels, and were more likely to be binge drinkers than

Cuban Americans or South or Central Americans [13]. It is unclear, however, if similar ethnic-specific drinking practices exist among those with diabetes.

This article describes and compares the drinking practices (current drinking status, number of drinks consumed per week, and binge drinking) of a nationally representative sample of white, black, Mexican American, and other Hispanic adults with diabetes. Based on ethnic differences in drinking practices in the general population (described previously), we hypothesize that white diabetics will be more likely to be current drinkers and will consume a higher number of drinks per week than black, Mexican American, and other Hispanics. In addition, among men, we expect that Mexican American diabetics will be more likely than white, black, and other Hispanic diabetics to be binge drinkers. Among women, we expect white diabetics to be more likely than black, Mexican American, and other Hispanic diabetics to be binge drinkers.

Methods

Sampling and data collection

Respondents are from four combined years (2005/2006—2011/2012) of the National Health and Nutrition Examination Survey (NHANES) [17]. This cross-sectional survey is conducted by the

National Center for Health Statistics and provides nationally representative estimates of health and disease in the US civilian noninstitutionalized population. NHANES includes in-home interviews using a computer-assisted personal interview system and health examinations in mobile examination centers. NHANES uses a complex multistage probability sampling design with oversampling of subgroups in different years. Approximately 5000 individuals participate annually. The mean response rate across the United States for 2005/2006 to 2011/2012 was approximately 75%. These analyses include home interview data from 2220 self-reported diabetic adults ($\geq$21 years) who were of white ($n = 875$), black ($n = 720$), Mexican American ($n = 402$), or other Hispanic ($n = 223$) ethnicity and for whom there were complete data on alcohol consumption. Diabetic status was determined with the following question: "Other than during pregnancy, have you ever been told by a doctor or other health professional that you have diabetes or sugar diabetes?"

Measures

Drinking status

Drinking status was categorized for bivariate analysis as (1) lifelong abstainers, (2) ex-drinkers, and (3) current drinkers (any alcohol in the past 12 months). For multivariate analysis, drinking status was treated as a dichotomy (abstainers vs. drinkers).

Number of drinks consumed per week

This continuous measure was assessed by combining the self-reported frequency and quantity of drinking wine, beer, and liquor in the previous 12 months (standard drink: 5 ounces of wine, 12 ounces of beer, or 1½ ounces of liquor). The raw values are presented in Table 2, and because the distribution of this variable was substantially skewed, it was log transformed for the regression models presented in Table 4.

Binge drinking

The National Institute of Alcohol Abuse and Alcoholism (NIAAA) defines binge drinking as consumption of more than five (men) or four or more (women) drinks in about a 2-hour period [18]. NHANES did not define binge drinking in this manner until survey year 2011/2012. For consistency across survey years included in these analyses, binge drinking is defined as per survey years 2006 to 2010: as consumption of five or more in a day in the previous year. Respondents were categorized as (1) lifelong abstainers, ex-drinkers, and current drinkers who did not binge; and (2) current drinkers who binged one or more time. Binge drinking among current drinkers was also assessed: non-binge drinkers versus binge drinkers.

Health status

Health status was controlled for in the analyses because of its possible impact on alcohol consumption [5]. These included insulin dependence (no, yes) and the presence of comorbid medical conditions in addition to diabetes. The comorbidity measure was composed of the presence of 15 medical conditions included in the NHANES questionnaire: asthma, arthritis, heart failure, coronary heart disease, angina, heart attack, stroke, emphysema, chronic bronchitis, liver disease, thyroid condition, gout, vision problems, cancer, and high blood pressure. The presence of each condition was coded as 1 (vs. 0 for not present). This additive measure was treated in the analyses, as a categorical variable to represent those with (1) diabetes only, (2) diabetes and one additional condition, and (3) diabetes and two or more additional conditions.

Table 1
Sample description: all diabetic respondents stratified by sex among those aged 21 years or older with self-reported diabetes (NHANES 2005–2012)*

	All diabetics $n = 2220$		Male diabetics $n = 1113$		Female diabetics $n = 1107$	
Mean age (range: 21–85 y)	59.7 y ($\pm$0.43)		59.3 y ($\pm$0.58)		60.1 y ($\pm$0.57)	
	%	N	%	N	%	N
Ethnicity						
White	66.6	875	69.5	477	63.8	398
Black	18.9	720	16.4	340	21.4	380
Mexican American	8.7	402	8.7	190	8.7	212
Other Hispanic	5.8	223	5.4	106	6.1	117
Level of education						
<High school	28.3	889	26.4	436	30.1	453
High school diploma or equivalent	25.8	510	23.8	234	27.8	276
Some college or higher	45.8	817	49.8	442	42.1	375
Annual income ($)						
<20,000	25.0	691	19.2	296	30.5	395
20,000–44,999	35.0	733	34.0	382	35.9	351
45,000–64,000	14.5	264	15.3	138	13.7	126
$\geq$65,000	25.5	355	31.5	221	19.8	134
Employment status						
Employed full/part time	40.2	682	44.9	387	36.3	295
Unemployed/disabled	21.5	559	20.9	267	22.9	295
Retired	31.6	800	31.8	429	32.0	371
Female homemaker/ student/other	6.7	179	2.3	30	8.7	116
Marital status						
Married/cohabitating	61.1	1247	71.7	759	50.9	488
Separated/divorced	17.6	408	14.5	172	20.6	236
Widowed	12.7	369	5.1	89	20.1	280
Never married	8.5	192	8.7	91	8.4	101
Insulin dependent	30.0	638	33.1	345	27.0	293
Comorbid health conditions						
Diabetes only	10.5	236	13.3	143	7.9	93
Diabetes plus one condition	19.3	419	23.8	242	15.1	177
Diabetes plus $\geq$ two conditions	70.1	1565	62.9	728	77.1	837

* Table reports unweighted sample sizes and weighted proportions; *N*s range from 2220 to 2045 (full sample), 1113 to 1037 (men), and 1107 to1006 (women) because of missing data for some variables.

Sociodemographics

These included age (continuous), sex, ethnicity (white, black, Mexican American, and other Hispanic), level of education (<high school, high school diploma or equivalent, and some college, college degree, or higher), income (<$20,000, $20,000–$44,999, $45,000–$64,999, and $\geq$$65,000), employment status (employed, unemployed/disabled, retired, and homemaker, student, or other), and marital status (married or cohabitating, separated or divorced, widowed, and never married).

Data analyses

To account for the complex sample design of NHANES, data were analyzed using the survey setup command, svyset, in Stata 13.0 (StatCorp, College Station, TX) [19]. Analyses were conducted on data weighted to correct for unequal probabilities of selection into the sample and for nonresponse bias. Tables depict unweighted *N*s and weighted proportions. Bivariate associations were assessed with chi-square statistics and *t* tests. Logistic regression was used to assess predictors of drinking status and binge drinking, and linear regression for predictors of drinks consumed per week. All multivariate models were developed by fully adjusting for all study independent variable, regardless of their level of significance. Because drinking practices vary by gender [10,11]; gender-specific models were run for the three alcohol outcome variables.