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Correlates of lifetime alcohol misuse among older community residents in Brazil

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Abstract

Background—Little is known about the sociodemographic correlates and health effects associated with lifetime alcohol misuse in community resident elderly in Brazil.

Method—Data came from a representative sample of 6961 residents aged 60+ in the State of Rio Grande do Sul, Brazil. The structured interview included a five-item lifetime alcohol use questionnaire addressing abuse and dependence, and enquiry regarding sociodemographic characteristics, lifestyle and social support, and health conditions.

Results—Of the sample, 10.6% (25.3% men, 2.9% women) endorsed at least one lifetime alcohol misuse question. Controlled analyses comparing a gradient of alcohol misuse (none, one, more than one item endorsed), found that men, people age 60–69 (compared to older persons), and tobacco users were more likely to endorse alcohol misuse items. Persons reporting lower income, and of nonWhite race/ethnicity did not differ from their comparison groups with respect to endorsing one item, but they were more likely to endorse two or more items. Endorsing more than one item was associated with impaired activities of daily living, the presence of respiratory problems and psychiatric disorder, but was protective against vascular conditions.

Conclusions—Major lifetime alcohol misuse (defined as endorsing more than one of five items reflecting alcohol abuse or dependence) is more common in certain sociodemographic groups (men, younger elderly, lower income, nonWhites). With the exception of vascular conditions, it is associated with smoking, poorer functional status, respiratory problems, and psychiatric disorder. Endorsing only one item has a reduced association, significant only for male gender, smoking, and psychiatric disorder.

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Keywords

prevalence; lifetime alcohol use; elderly; health conditions

Introduction

Information on the extent and impact of lifetime alcohol misuse in older persons remains sparse, and especially so for countries in South America with an increasing older population (Almeida Filho *et al.*, 2004; Barros *et al.*, 2007; Galduróz and Carlini, 2007; Laranjeira *et al.*, 2007; Mendoza-Sassi and Beria, 2003; Vicente *et al.*, 2006; Silveira *et al.*, 2007).

Studies indicate that moderate alcohol use may be beneficial, protecting cardiac and cognitive function, improving physical and functional performance, and reducing the hazard of all-cause mortality (Cawthon *et al.*, 2007). However, the adverse effects of inappropriate alcohol use are of particular concern with respect to the elderly because of association with the development of liver disease, various cancers, hypertension, falls, decrease in bone density, cognitive impairment, psychiatric disorders, and drug interactions (Council on Scientific Affairs, 1996; National Institute on Alcohol Abuse and Alcoholism, 1998).

Our focus is Brazil, and in particular community residents 60 years of age and older in the wine state of Rio Grande do Sul in the south. Here we examine self-reported lifetime alcohol misuse in order to ascertain the prevalence of this condition, identify the characteristics of such alcohol misusers, their current lifestyle and social environment, and health status.

Methods

Sample

This cross-sectional study of non-institutionalized persons 60 years of age and over was based on multistage, stratified random sampling in nine homogeneous areas covering the state of Rio Grande do Sul, Brazil. This is a notable wine region located in the southern area of the country, with a largely agro-industrial economy, populated primarily by descendants of European immigrants. Data were gathered in 1995 in face-to-face household surveys of 7920 residents of urban and rural counties. The structured interview included assessment of sociodemographic characteristics, activity (physical exercise and employment) and living arrangements, physical and mental health, functional status, and a 5-item questionnaire on lifetime alcohol abuse and dependency, here called alcohol misuse. Details on methods have been reported previously (Blay *et al.*, 2007; Conselho Estadual do Idoso, 1997). The study was approved by the Ethics Committee of the Federal University of Sao Paulo. Participants gave oral consent.

Data gathering and quality control

Data were gathered by carefully trained, closely supervised, interviewers. Review of the database identified data entry problems in one region, which was then excluded from analysis. Eight hundred and eighty persons were approached in each of the remaining eight regions, for a total of 7040 persons. No proxy information was collected. Non-response was negligible: 79 persons (1.1%) did not take part in the assessment, primarily refusals, yielding an overall response rate of 99% (N = 6961). Two additional persons were dropped because of missing data.

Data obtained

Dependent variable: Evaluation of alcohol use—Use of alcohol was determined by response (yes/no) to each of the following questions, of which questions 1, 3, and 4 address

lifetime abuse of alcohol, and questions 2 and 5 address lifetime dependence (Hasin *et al.*, 2007; American Psychiatric Association, 1994):

1. Has your family, your friends, your physician or your priest ever commented or suggested that you were drinking too much?
2. Have you ever tried to stop drinking but been unable to do so?
3. Have you ever had trouble at work or school because of alcohol, such as drinking or missing work?
4. Have you ever been involved in fights or arrested for being drunk?
5. Has it ever seemed to you that you were drinking too much?

Participants were not asked when the situation occurred. Positive responses were summed, yielding a score that could range from 0–5. Scores were trichotomized as 0, 1, more than 1.

Independent variables—Independent variables were classified into three categories: sociodemographic (to determine the characteristics of users), lifestyle and social environment (to identify potentially protective and risky behaviors), and health (to identify association with health status).

Sociodemographic measures included gender, age (60–69 years, 70–79 years, 80+ years), education (0–3 years, ≥ 4 years), income (low income <US\$200.00/month, high income \geq US \$200.00/month [the cutpoint indicates a standard poverty level]), race/ethnicity (Caucasian, African-Brazilian, Other), religious affiliation (Catholic, Evangelical, Other), and place of birth (urban vs. rural area).

Lifestyle included exercise, assessed by asking: “In the last three months did you practice a regular physical activity?” (yes [once a week or more]/no); employment status (employed if they were still working (the type of work was immaterial), and inactive if they were not working or did not know the answer); and current use of tobacco (yes/no). *Social environment* included marital status (married, never married, no longer married/ cohabiting), whether living alone or with someone else, the presence of children, and participation in social activities and religion-affiliated activities.

Health conditions: Participants self-reported on the presence of 18 medical conditions. Preliminary analysis indicated that the only conditions relevant in this population were vascular conditions (any mention of heart disease, hypertension, diabetes, stroke, varicose veins), respiratory problems (any mention of bronchitis or pneumonia), kidney problems, osteoporosis, and psychiatric problems. The presence of psychiatric problems was determined by response on a 6-item abbreviation of the Short Psychiatric Evaluation Schedule (Blay *et al.*, 1988; Pfeiffer, 1979), a valid measure for assessment of psychiatric status in Brazilian elderly. Problem with activities of daily living (ADL) was assessed by a 5-item unidimensional scale, that sought information on whether participants could perform household activities (clean, maintain, cook); take their medicines; bathe/comb hair/dress; eat; walk/ sit/ lie down/ get around indoors/walk up stairs. The number of impaired activities was recoded as 0, 1–2, and 3 or more.

Statistical Analysis

Percentages were used to describe the sample, and chi square to ascertain group differences. To determine which characteristics were associated with alcohol misuse (0, 1, 2 or more items endorsed) we used polytomous multivariable logistic regression. We first permitted all variables meeting criteria of $P < 0.05$ to enter the model, and then ran a final model including

only those variables found to be significant in this preliminary analysis. Because of the number of analyses, in the final model we accept as significant only those variables meeting the criterion of $P < 0.01$. All analyses were performed using SPSS 13.0.

Results

Lifetime alcohol use was ascertained for 6959 of the 6961 participants. Of these, 734 participants (10.55%) endorsed one or more of the five items indicating a problem with alcohol at some time, distributed as follows: one item endorsed – 314 (4.51%), two items – 229 (3.29%), three items – 126 (1.81%), four items – 47 (0.67%), five items – 18 (0.25%).

Examination of the individual alcohol questions showed that question 3 (Have you ever had trouble at work or school because of alcohol, such as drinking or missing work?) and question 4 (Have you ever been involved in fights or arrested for being drunk?) were endorsed by only 98 and 69 persons respectively, whereas question 5 (Has it ever seemed to you that you were drinking too much?) and question 1 (Has your family, your friends, your physician or your priest ever commented or suggested that you were drinking too much?) were endorsed by 566 and 456 persons respectively.

The basic characteristics of the sample, given also by whether they endorsed none, one, or two or more items, are given in Table 1. Two thirds were female, primarily younger (57% under age 70), of low education and low income, and born in a rural area. The preponderant majority was white (84%), and Catholic (75%).

Uncontrolled analyses indicated that men were more likely to report problems with alcohol than were women (25.3% as compared to 2.9%), report of alcohol-associated problems declined with increase in age, was higher among persons with less education, but did not differ significantly by income level. Race was a factor (more problems reported among nonWhites), but religious affiliation, place of birth, physical activity, having offspring and living arrangements were not. Persons reporting lifetime alcohol misuse were more likely to currently use tobacco, had never been married, were currently employed, and participated in religion-affiliated activities. With the exception of vascular conditions, where alcohol misuse was protective, misuse was associated with poorer functional and physical health status, and with psychiatric problems.

Polytomous multivariable logistic regression (Table 2), compared persons reporting one alcohol misuse item, and those reporting two or more misuse items, with persons reporting no misuse. While 21 characteristics were considered (seven sociodemographic, eight lifestyle and social environment, six health status and health conditions), only 10 entered the final model (four sociodemographic, two lifestyle and social environment, and four health status and health conditions). Of these only three (male gender, current tobacco use, current psychiatric problem) was associated (at the predetermined significance level of $P < 0.01$ or less) with endorsing only one alcohol misuse item, while all but one variable (marital status) was associated with endorsement of two or more items. For all variables there was a gradient of response from higher to lower association going from two or more alcohol misuse items endorsed, to one item endorsed, to none endorsed. There was also a gradient within individual multilevel variables.

For sociodemographic characteristics, this controlled analysis indicated that men were more likely to be alcohol misusers than were women (the odds were eight times greater when only one alcohol misuse item had been endorsed, but 20 times greater when more than one item was endorsed). While there were no age-related differences for endorsing a single misuse item, as age increased, endorsement of two or more items decreased. Odds of severer alcohol misuse was higher among persons of lower income, and among nonwhites, particularly African Brazilians, who were nearly three times as likely as White Brazilians to endorse more than one

item. Tobacco users were twice as likely as nontobacco users to report alcohol misuse. Endorsing two or more items doubled the odds of multiple ADL problems and of the presence of psychiatric problems. It increased the odds of respiratory problems, but reduced the odds of vascular conditions by a third.

Discussion

Data for the current study come from a large representative sample of community residents 60 years of age and older, in the state of Rio Grande do Sul in Brazil, who provided information on multiple aspects of aging. Included was a 5-item questionnaire permitting assessment of lifetime alcohol misuse. Of the five items, three addressed aspects of alcohol abuse (put simply, the social consequences of alcohol misuse), and two addressed aspects of alcohol dependence (the physiological consequences). Since this measure does not meet diagnostic criteria for assessment of alcohol use disorder, we have summed the responses, and examined how, compared with endorsement of no items, endorsement of one item compared with endorsement of two or more items, with respect to sociodemographic characteristics, lifestyle and social environmental conditions, and health status.

Comparison with other studies in Brazil, or in the region, is difficult. Focus on lifetime use is infrequent; the samples rarely include residents over the age of 59; are often small, resulting in questionable findings; and multiple different measures to assess alcohol use have been used (Galduróz and Carlini, 2007; Mendoza-Sassi and Beria, 2003; Silveira *et al.*, 2007; Vicente *et al.*, 2006). Our findings that 10.6% of the sample report lifetime alcohol misuse, compares with reports ranging from 2.7% in Campinas, Southeastern Brazil (based on 93 sample members age 60 and over) (Barros *et al.*, 2007), to 12% for frequent or heavy drinkers in a subsample 60 years and over in a national survey (Laranjeira *et al.*, 2007). Thus, our findings are not remarkable for Brazil. They tend to be lower than for similar age participants in nationally representative US studies (using a variety of measures), which range from 8.4% to 16.1% (Hasin *et al.*, 2007; Kessler and Wang, 2008). In agreement with other studies, our rates for men (25.3%) are higher than for women (2.9%). Johnson (2000) for instance, in his review, cites as the highest rate 17% for men and 2% for women, a ratio comparable to that which we found.

While population studies typically report that lifetime alcohol misuse declines with increase in age, we found none that explored this issue in persons over age 60. Our data indicate that reported alcohol misuse continues to decline among those 60 and over. Why this is so is unclear. It may reflect a survival effect, unwillingness to acknowledge inappropriate behavior, forgetting, secular differences in acceptable behavior, or some other reason.

We found that alcohol disorder was more common in minority African-Brazilians than in the majority White population. Comparison data from the US is ambiguous, indicating that alcohol use may be curvilinear in African Americans (very little use and considerable use) (Mirand and Welte, 1996), or result in fewer problems in African American men (but not African American women) as compared to their White counterparts (Hasin and Grant, 2004).

While uncontrolled analyses indicated that lower education, but not lower income, was associated with alcohol misuse, controlled analyses indicated the reverse, a finding confirmed by others (Barros *et al.*, 2007; Council on Scientific Affairs, 1996; Grant *et al.*, 2007; Hasin *et al.*, 2007; Mirand and Welte, 1996; Silveira *et al.*, 2007). Lack of association with religion, employment status, and an active lifestyle have been demonstrated previously (Mirand and Welte, 1996).

Our data agree with that of multiple other studies, that tobacco use is associated with alcohol disorder (John *et al.*, 2003), although one study reported no association (Chou *et al.*, 1996).

Various suggestions have been proposed to explain the link between smoking and alcohol: cross-tolerance, shared genetic and environmental influences, ability of each substance to counteract some of the adverse effects of the other, mutual effect on metabolism, and alcohol-associated disinhibition that counteracts restraints against smoking (National Institute on Alcohol Abuse and Alcoholism, 2002).

Although moderate alcohol use has been found to have a protective vascular effect, it is unclear why, in the present study, it is more severe alcohol misuse that reduces the odds of vascular conditions. This may be a survivor effect, or reflect corrective action on cessation of alcohol misuse.

Severe lifetime alcohol misuse was associated with poorer functional status, possibly reflecting adverse impact on health conditions not included in analysis. Increased odds of respiratory disorders and psychiatric conditions confirm previous reports (Kyomen *et al.*, 1994; Chou *et al.*, 1996; Goldstein *et al.*, 2006; Hasin *et al.*, 2007). The strong association between alcohol and depression (the most prevalent psychiatric disorder identified in the present sample) has been attributed to a number of factors, including the depression-inducing effect of alcohol, the use of alcohol to alleviate depression (Schuckit, 2006; Goodwin and Jamison, 2007), and possible common underlying genetic disposition (Maher *et al.*, 2002).

This study has certain limitations. First, lifetime alcohol misuse was based on a screening questionnaire and not a comprehensive psychiatric diagnostic interview. Second, our prevalence estimates are probably conservative. We sampled only the noninstitutionalised and did not include the homeless, so excluding groups where the prevalence of lifetime alcohol misuse is likely to be higher. Third, the widely differing cultural and socioeconomic backgrounds present in Brazil may not have been fully represented, reducing the generalizability of the findings. Fourth, we relied on self-report. Self-report, however, has been found to be valid for alcohol use and problems (Midanik, 1982), and for health conditions (Beckett *et al.*, 2000). Fifth, we do not know when the problems with alcohol use occurred, and the cross-sectional design prevents determination of the causative relationship between inappropriate alcohol use and the variables examined here.

In conclusion, this study is based on a large representative sample of community residents 60 years of age and older in Brazil, taking into account more areas of concern than is usually the case. Just over 10% reported any lifetime alcohol misuse, a proportion comparable to that found by other studies in Brazil, but smaller than reported for major U.S. studies. With the exception of vascular disease, where it is difficult to explain the positive effect of alcohol misuse, lifetime alcohol misuse was associated with poorer functional status, and respiratory and psychiatric (primarily depressive) disorders. Misuse was more likely to be reported by men, non-Whites, persons with low income, and tobacco users. Alcohol misuse, probably occurring at a younger age, has implications for health status in older age.

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Table 1
 Characteristics of the total sample, and by number of lifetime alcohol use items endorsed.

	Total sample (N = 6959) N (%)	Number of lifetime alcohol use items endorsed			P (based on chi square test)
		0 (N=6225) N (%)	1 (N=314) N (%)	2+ (N=420) N (%)	
Sociodemographic characteristics					
Sex:					0.001
Female	4592(66.0)	4457 (97.1)	78 (1.7)	57 (1.2)	
Male	2366(34.0)	1767 (74.7)	236 (10.0)	363 (15.3)	
Age:					0.001
60–69	3951 (56.8)	3472 (87.9)	200 (5.1)	279 (7.1)	
70–79	2281 (32.8)	2071 (90.8)	94 (4.1)	116 (5.1)	
80+	727 (10.4)	682 (93.8)	20 (2.8)	25 (3.4)	
Education:					0.001
<4 years	4592 (66.0)	4064 (88.5)	209 (4.6)	319 (6.9)	
≥4 years	2344 (34.0)	2140 (91.3)	104 (4.4)	100 (4.3)	
Income:					0.258
Low income	4323 (62.1)	3877 (89.7)	186 (4.3)	260 (6.0)	
Higher inc.	2414 (34.7)	2147 (88.9)	125 (5.2)	142 (5.9)	
Race:					0.001
White	5860 (84.2)	5307 (90.6)	249 (4.2)	304 (5.2)	
Afro-Brazilian	472 (6.8)	392 (83.1)	20 (4.2)	60 (12.7)	
Other	625 (9.0)	524 (83.8)	45 (7.2)	56 (9.0)	
Religion:					0.061
Catholic	5245 (75.3)	4688 (89.4)	248 (4.7)	309 (5.9)	
Evangelical	1077 (15.5)	978 (90.8)	40 (3.7)	59 (5.5)	
Other	609 (8.7)	533 (87.5)	25 (4.1)	51 (8.4)	

	Total sample (N = 6959) N (%)	Number of lifetime alcohol use items endorsed			P (based on chi square test)
		0 (N=6225) N (%)	1 (N=314) N (%)	2+ (N=420) N (%)	
Lifestyle and social arrangements					
Place of birth:					0.200
Urban	2363 (33.9)	2135 (90.4)	97 (4.1)	131 (5.5)	
Rural	4526 (65.1)	4026 (89.0)	214 (4.7)	286 (6.3)	
Physical activity:					0.270
No	4316 (62.0)	3859 (89.4)	185 (4.3)	272 (6.3)	
Yes	2608 (37.5)	2331 (89.4)	129 (4.9)	148 (5.7)	
Use tobacco:					0.001
Yes	1302 (18.7)	981 (75.3)	119 (9.1)	202 (15.5)	
No	5632 (80.9)	5219 (92.7)	195 (3.5)	218 (3.9)	
Marital status:					0.001
Married	3159 (45.4)	2739 (86.7)	184 (5.8)	236 (7.5)	
Never married	471 (6.8)	403 (85.6)	27 (5.7)	41 (8.7)	
No longer married	3327 (47.8)	3081 (92.6)	103 (3.1)	143 (4.3)	
Children:					0.812
Yes	6492 (93.3)	5803 (89.4)	296 (4.6)	393 (6.1)	
No	445 (6.4)	402 (90.3)	18 (4.0)	25 (5.6)	
Living arrangements:					0.832
Live with someone	5893 (84.7)	5265 (89.3)	269 (4.6)	353 (6.1)	
Live alone	1056 (15.2)	950 (90.0)	45 (4.3)	61 (5.8)	
Employed:					0.001
No	5992 (86.1)	5414 (90.4)	259 (4.3)	319 (5.3)	
Yes	940 (13.5)	787 (83.7)	53 (5.6)	100 (10.6)	

	Total sample (N = 6959) N (%)	Number of lifetime alcohol use items endorsed			P (based on chi square test)
		0 (N=6225) N (%)	1 (N=314) N (%)	2+ (N=420) N (%)	
Participate in social activities:					
No	4221 (60.6)	3735 (88.5)	202 (4.8)	284 (6.7)	0.003
Yes	2736 (39.3)	2488 (90.9)	112 (4.1)	136 (5.0)	
Religion-affiliated activities:					
No	1977 (28.4)	1696 (85.8)	110 (5.6)	171 (8.6)	0.001
Yes	4964 (71.3)	4512 (90.9)	204 (4.1)	248 (5.0)	
Health conditions					
ADL problems:					
0	4238 (60.9)	3791 (89.5)	194 (4.6)	253 (6.0)	0.009
1-2	2195(31.5)	1978 (90.1)	100 (4.6)	117 (5.3)	
3+	526 (7.6)	456 (86.7)	20 (3.8)	50 (9.5)	
Vascular conditions:					
Yes	4390 (63.1)	4016 (91.5)	165 (3.8)	209 (4.8)	0.001
No	2542 (36.5)	2182 (85.8)	149 (5.9)	211 (8.3)	
Respiratory conditions:					
Yes	2059 (29.6)	1767 (85.8)	115 (5.6)	117 (8.6)	0.001
No	4898 (70.4)	4456 (91.0)	199 (4.1)	243 (5.0)	
Kidney problems:					
Yes	897 (12.9)	777 (86.6)	39 (4.3)	81 (9.0)	0.001
No	6062 (87.1)	5448 (89.9)	275 (4.5)	339 (5.6)	
Osteoporosis:					
Yes	1047 (15.0)	947 (93.0)	27 (2.6)	46 (4.4)	0.001
No	5912 (85.0)	5251 (88.8)	287 (4.9)	374 (6.3)	

	Total sample (N = 6959 N (%))	Number of lifetime alcohol use items endorsed			P (based on chi square test)
		0 (N=6225) N (%)	1 (N=314) N (%)	2+ (N=420) N (%)	
Psychiatric problem:					
Yes	2722 (39.1)	2378 (87.4)	133 (4.9)	211 (7.8)	0.001
No	4237 (60.9)	3847 (90.8)	181 (4.3)	209 (4.9)	

Values may not total to 6959, and percentages may not sum to 100 because of missing data.

Vascular conditions include any mention of heart disease, hypertension, diabetes, stroke, varicosities; respiratory problems include any mention of bronchitis or pneumonia.

Table 2

Polytomous logistic regression comparing endorsement of one item indicating alcohol misuse and of two or more items indicating alcohol misuse with endorsement of no items indicating misuse.

	One alcohol misuse item endorsed	Two or more alcohol misuse items endorsed
	OR (99% CI) [P value]	OR (99% CI) [P value]
Sociodemographic characteristics		
Sex: Male	8.19 (5.56, 12.06) [0.001]	20.81(13.62, 31.79) [0.001]
Age:		
60–69	Reference	Reference
70–79	0.81 (0.57, 1.15) [0.12]	0.69 (0.49, 0.96) [0.004]
80+	0.57 (0.29, 1.10) [0.03]	0.42 (0.22, 0.79) [0.001]
Income: Lower income	1.19 (0.85, 1.67) [0.18]	1.42 (1.03, 1.95) [0.005]
Race:		
White	Reference	Reference
African-Brazilian	1.17 (0.62, 2.22) [0.09]	2.85 (1.78, 4.57) [0.001]
Other	1.36 (0.85, 2.17) [0.60]	1.34 (1.85, 2.10) [0.001]
Lifestyle & social environment		
Tobacco use: Yes	2.02 (1.43, 2.83) [0.001]	2.44(1.79,3.32) [0.001]
Marital status:		
No longer married	Reference	Reference
Married	0.91 (0.63, 1.32) [0.53]	0.77 (0.55, 1.08) [0.05]
Never married	1.61 (0.87, 2.96) [0.05]	1.49 (0.84, 2.65) [0.07]
Health status and health conditions		
Impaired activities of daily living:		
0 problems	Reference	Reference
1–2 problem	1.26 (0.88, 1.80) [0.10]	1.12 (0.79, 1.59) [0.39]
3+ problems	1.14 (0.58, 2.24) [0.61]	1.93 (1.13, 3.30) [0.001]
Vascular condition - Yes	0.74 (0.53, 1.03) [0.02]	0.63 (0.46, 0.86) [0.001]
Respiratory condition - Yes	1.22 (0.87, 1.71) [0.12]	1.43 (1.05, 1.94) [0.003]
Psychiatric problem - Yes	1.57 (1.11, 2.22) [0.001]	2.19 (1.58, 3.03) [0.001]

The variables considered are the sociodemographic, lifestyle and social environment, and health conditions listed in Table 1. The significant variables entered into a prior analysis (which required $P > 0.05$ to enter) were selected for this final model.

OR = Odds Ratio; CI = Confidence Interval