Screening for Problem Drinking in Older Primary Care Patients

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Objectives.—To describe potentially hazardous alcohol use among elderly patients in the primary care setting and to assess the widely used CAGE questionnaire (*c*ut down, *a*nnoyed by criticism, *g*uilty about drinking, *e*ye-opener drinks) as a tool for detecting self-reported heavy and binge drinking among these patients.

Design.—Cross-sectional study.

Setting.—The offices of 88 primary care physicians at 21 sites in southeastern Wisconsin.

Patients.—A total of 5065 consecutive consenting patients older than 60 years.

Measures.—A previously validated self-administered questionnaire that included beverage-specific questions about the quantity and frequency of regular drinking in the last 3 months, the number of episodes of binge drinking (≥6 drinks per occasion), and the CAGE questionnaire.

Results.—Fifteen percent of men and 12% of women regularly drank in excess of limits recommended by the National Institute of Alcohol Abuse and Alcoholism (>7 drinks per week for women and >14 drinks per week for men). Nine percent of men and 2% of women reported regularly consuming more than 21 drinks per week. When we administered the CAGE questionnaire, 9% of men and 3% of women screened positive for alcohol abuse within 3 months. The CAGE performed poorly in detecting heavy or binge drinkers; fewer than half were CAGE positive when the standard cutoff of 2 positive answers was used.

Conclusions.—Alcohol consumption in excess of recommended limits is common among elderly outpatients. The CAGE questionnaire alone is insufficient to detect such drinking. Asking questions on the quantity and frequency of drinking in addition to administering the CAGE increases the number of problem drinkers detected.

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HEAVY ALCOHOL use contributes substantially to morbidity, mortality, and hospitalizations among elderly people. In the general population, the prevalence of alcohol abuse and dependence among people aged 65 years and older is 2% to 4%.[1,2] Up to 10% of older people have less severe problems related to their alcohol use.[1] Although the frequency of alcohol-related problems in the general population declines with increasing age,[3-6] in medical settings the frequency remains high among elderly people.[7-9] People with alcohol problems often present to their primary care physicians: between 4% and 10% of elderly outpatients are actively alcoholic.[10-13] Because the population is aging, the number of elderly people with alcohol problems will increase, even if the prevalence remains constant. Thus, recognizing and addressing alcohol problems among older people is important.

Alcohol consumption can be medically hazardous even when the drinking behavior does not warrant a formal diagnosis of alcohol abuse or alcoholism. For example, the risk of hypertension and several cancers increases with alcohol consumption between 2 and 3 drinks per day.[14-21] The pattern of alcohol use may also be important in determining the risk of illness or injury resulting from alcohol use. In the National Health and Nutrition Examination Survey follow-up study, for instance, the number of drinks per occasion was an important risk factor for death from injury, whereas the frequency of drinking was not.[22] Screening for problem drinking among elderly people clearly should aim to detect those whose alcohol use puts them at risk for medical problems whether or not they meet criteria for alcohol abuse or alcoholism.

The objectives of this report are to describe potentially hazardous alcohol use in a large sample of elderly people in the primary care setting and to assess the performance of the widely used CAGE questionnaire (*c*ut down, *a*nnoyed by criticism, *g*uilty about drinking, *e*ye-opener drinks) as a tool for detecting heavy and binge drinking among these patients.

METHODS

This cross-sectional study of elderly primary care patients was conducted in the offices of 88 primary care physicians at 21 sites. Practices were initially identified by a list of Wisconsin primary care physicians maintained by the Wisconsin Institute of Family Medicine. The practices were located in rural and urban areas in south central and southeastern Wisconsin and varied from solo practices to large health maintenance organization groups. The study was approved by the University of Wisconsin institutional review board. Between July 1, 1992, and July 1, 1994, we surveyed 5065 patients older than 60 years. All patients willing and able to sign the informed consent form and complete the questionnaire were included. The rate of patient refusal varied by practice with a range of 2% to 30% and a weighted mean of 13%. The most common reasons given for refusal were lack of time and being too ill to complete the questionnaire.

A Health Screening Survey (HSS)[23] was distributed to patients on arrival in their physicians' offices by reception staff and collected before departure. The HSS was based on a questionnaire originally developed in 1985 by Wallace et al[24] for a large clinical trial in England. Questions about alcohol use are embedded in a questionnaire that also inquires about smoking, exercise, and diet. Our version was validated in 2 samples of people in treatment for alcoholism and 1 primary care sample.[23] Test-retest correlations on all of the individual items yielded intraclass reliability coefficients of $r=0.95$ and $r=0.93$ in the treatment samples. The Cronbach α reliability coefficient of the HSS in the primary care sample was 0.73. There were no significant sex differences in the internal reliability of the instrument.

There are 4 sets of alcohol-related questions in the HSS. The first section on alcohol use asks patients if they have consumed any alcohol in the previous 3

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months. Those who respond yes are then asked more detailed consumption questions. For each of 3 categories of beverages (beer, wine, or liquor), examples are cited and respondents are asked to indicate "on average" the number of days per week the beverage was consumed and the number of glasses (in the case of wine), bottles or cans (in the case of beer), or shots (in the case of liquor) consumed on 1 day by marking the appropriate category. Alcohol consumption is tabulated as the average number of drinks per week of all 3 types of alcohol consumed. The second area of use, the number of episodes of binge drinking, is determined by a question about the number of times the patient has had 6 or more drinks on 1 occasion in the past 3 months. This definition of binge drinking was based on the World Health Organization criteria used in the development of the Alcohol Use Disorders Identification Test.[25]

The 4-item CAGE questionnaire[26,27] was the third alcohol-related measure included in the survey. Subjects were asked: "In the last 3 months, have you felt you should cut down on your drinking? Has anyone annoyed you by telling you to cut down or stop your drinking? Have you felt guilty or bad about your drinking? Have you been waking up in the morning wanting to have an alcoholic drink?" The final alcohol-related question determined past problems. Patients were asked, "Now that you have completed this form, do you think you have ever had a drinking problem?" Demographic data included age, sex, education, race, ethnicity, marital status, and current occupation. Individual variables were categorized.

Data were summarized and statistically analyzed using SPSS software. Frequency distributions and summary statistics were calculated for variables of interest. The χ^2 tests were used to assess the associations of demographic variables with levels of drinking. Age, sex, race (white vs nonwhite), education, and marital status were then entered into a logistic regression model to determine which demographic factors independently predicted alcohol use and misuse. Sensitivity, specificity, predictive values, and likelihood ratios were also calculated.

RESULTS

A total of 5065 patients older than 60 years completed questionnaires. Of these respondents, 84% were in the "younger old" group (60-75 years), and the remainder were over 75 years. Fifty-six percent were women. Seventy-two percent were currently married; 20% were widowed. Twenty-three percent lived alone. Eleven percent had a college education. Ninety-five percent identified a racial/ethnic background. Of those, 92.5% identified themselves as white. Nonwhites were more likely to be women (62% vs 54%, $P=.006$) and less likely to be currently married (67% vs 73%, $P=.02$) or college educated (6% vs 12%, $P<.001$).

Table 1.—Weekly Alcohol Consumption by Age and Sex*

Mean Drinks/wk	61-65 y		66-75 y		>75 y	
	Men	Women	Men	Women	Men	Women
<1	320 (40.3)	567 (58.5)	530 (49.8)	930 (70.3)	172 (57.3)	381 (80.5)
1-7	197 (24.8)	252 (26.0)	225 (21.1)	250 (18.9)	54 (18.0)	49 (10.4)
8-14	144 (18.1)	110 (11.3)	157 (14.7)	97 (7.3)	41 (13.7)	29 (6.1)
15-21	44 (5.5)	17 (1.8)	59 (5.5)	21 (1.6)	13 (4.3)	7 (1.5)
>21	89 (11.2)	24 (2.5)	94 (8.8)	25 (1.9)	20 (6.7)	7 (1.5)

*Values given are number (percentage). Some columns do not total 100% because of rounding.

Table 1 shows the respondents' usual weekly alcohol intake in age and sex groups. Alcohol use was more common among men than women at all ages and declined with increasing age for both sexes. In a logistic regression model, male sex (odds ratio [OR], 2.1; 95% confidence interval [CI], 1.8-2.4), age less than 65 years (OR, 1.5; 95% CI, 1.3-1.6), white race (OR, 1.5; 95% CI, 1.1-1.9), college education (OR, 1.5; 95% CI, 1.3-1.7), and currently married status (OR, 1.30; 95% CI, 1.26-1.72) were significantly independently associated with alcohol use.

The US Department of Agriculture, in its *Dietary Guidelines for Americans*,[28] and the National Institute of Alcohol Abuse and Alcoholism, in *The Physicians' Guide to Helping Patients With Alcohol Problems*,[29] have issued recommendations for safe limits of drinking. For women, more than 7 drinks per week and for men, more than 14 drinks per week are deemed unsafe. In this sample, 15% of men and 12% of women reported regularly drinking in excess of these limits. When examined in age groups, the prevalence was lower in each succeeding group of increased age. Nonetheless, among those aged 75 years and older 11% of men and 9% of women were drinking in excess of these limits.

There were 4 measures of more serious harmful drinking in the questionnaire: self-reported regular consumption of more than 21 drinks per week, binge drinking, the CAGE questionnaire, and ever having had a "drinking problem." The frequencies for each of these measures of potentially harmful drinking are shown in Table 2 by age and sex. The 3 measures of current harmful drinking declined in frequency with increasing age and were consistently more common among men than women. The frequency of a lifetime history of a drinking problem was also higher among men than women but did not decline with increasing age. In a logistic regression model, independent predictors of consuming more than 21 drinks per week were male sex (OR, 4.6; 95% CI, 3.3-6.4) and college education (OR, 1.5; 95% CI, 1.2-1.9). Logistic regression was also used to test for independent predictors of CAGE-positive status and binge drinking. Male sex (OR, 3.1; 95% CI, 2.3-4.1), college education (OR, 1.4; 95% CI, 1.1-1.7), and age less than 65 years (OR, 1.3; 95% CI, 1.0-1.5) significantly predicted CAGE-positive status (2 affirmative answers). For binge drinking, only male sex (OR, 7.1; 95% CI, 4.9-10.2) and age less than 65 years (OR, 2.1; 95% CI, 1.6-2.6) were significant positive predictors. Whites were less likely than nonwhites to be binge drinkers (OR, 0.56; 95% CI, 0.35-0.91).

The CAGE questionnaire is the most widely used validated screening tool for alcoholism in the primary care setting. In this sample, 8.7% of men and 3.1% of women screened positive for alcohol abuse within 3 months on the CAGE questionnaire if the usual cutoff of 2 or more affirmative answers was the standard. A cutoff score of 1 affirmative answer has been shown to increase sensitivity but decrease specificity.[11,30] If we used a cutoff of 1 affirmative answer, 19.6% of men and 8.6% of women were CAGE positive. In all age and sex groups except women over 75 years, the question most commonly answered affirmatively was "Have you ever felt you should cut down on your drinking?" Women older than 75 years were more likely to report having felt guilty about their drinking.

The ability of the CAGE questionnaire to detect heavy drinking, using our quantity and frequency measures as the criterion standards, is summarized in Table 3. The CAGE did not perform differently in whites and nonwhites. Sensitivity, the proportion of all problem drinkers who had positive CAGE scores, was uniformly low for heavy or binge drinking. Specificity, the proportion of non–problem drinkers who had negative CAGE scores, was uniformly high. Thus, the CAGE detected only a small proportion of heavy or binge drinkers, but rarely misclassified a non–problem drinker as a problem drinker. Using a cutoff point of 1 positive answer increased sensitivity, but not enough to make the CAGE a clinically useful test to exclude the possibility of a drinking problem, and a 1-answer cutoff also decreased specificity. The positive

Table 2.—Frequency of Problem Drinking by Age and Sex*

Measure	61-65 y		66-75 y		>75 y	
	Men	Women	Men	Women	Men	Women
>21 Drinks/wk	89 (11.2)	24 (2.5)	94 (8.8)	25 (1.9)	20 (6.7)	7 (1.5)
Binge drinking (≥6 drinks per occasion)	106 (14.1)	28 (3.0)	89 (8.8)	16 (1.3)	13 (4.6)	4 (0.9)
Self-reported drinking problem	86 (11.6)	33 (3.8)	105 (10.8)	40 (3.6)	28 (11.2)	11 (3.1)
CAGE results						
1 Question positive	176 (22.2)	101 (10.4)	200 (18.5)	106 (7.9)	51 (16.7)	32 (6.6)
2 Questions positive	83 (10.5)	38 (3.9)	84 (7.8)	39 (2.9)	23 (7.5)	10 (2.1)

*Values given are number (percentage). CAGE indicates *c*ut down, *a*nnoyed by criticism, *g*uilty about drinking, *e*ye-opener drinks (test for alcoholism).

Table 3.—Performance of the CAGE Questionnaire in Detecting Problem Drinking*

CAGE Results	Sensitivity, %	Specificity, %	PPV, %	NPV, %	Likelihood Ratio
1 CAGE question positive					
> Recommended limits†	31	92	57	80	4.2
>21 Drinks/wk	63	90	25	98	5.9
Binge drinking	59	89	24	97	5.3
2 CAGE questions positive					
> Recommended limits†	14	97	65	78	5.7
>21 Drinks/wk	40	96	38	97	11.1
Binge drinking	35	96	34	96	8.9

*CAGE indicates *c*ut down, *a*nnoyed by criticism, *g*uilty about drinking, *e*ye-opener drinks (test for alcoholism); PPV, positive predictive value; and NPV, negative predictive value.
†Recommended limits are 14 drinks per week for men and 7 drinks per week for women.

predictive value, the proportion of positive CAGE scores that were true positives, was also quite low for all the drinking measures, while the negative predictive value, the proportion of negative CAGE scores that were true negatives, was quite high. Likelihood ratios, which show how many more times the CAGE is likely to be positive in those with problem drinking than in those without, are also shown. For each measure, the likelihood ratio was higher when a cutoff point of 2 positive responses was used.

There were no significant differences in the demographics of heavy and binge drinkers who were CAGE positive vs those who were not. However, 26% of CAGE-positive problem drinkers were smokers as opposed to 15% of CAGE-negative problem drinkers ($P=.008$).

Cigarette smoking has been associated with alcohol use in many studies. In this sample, those who used alcohol were not significantly more likely than abstainers to smoke cigarettes (11.8% vs 10.3%, $P=.12$). Those who consumed more than 21 drinks per week, however, were more likely to smoke (18.8% vs 10.5%, $P<.001$), as were CAGE-positive respondents (28.9% vs 9.8%, $P<.001$).

In some cases, retirement may precipitate heavy drinking. Among those aged 61 to 65 years in this sample, 47% identified themselves as retired. Those who were retired were more likely to consume more than 21 drinks per week than those aged 61 to 65 years who were not retired (8.5% vs 5.7%, $P=.04$). They were also more likely to report binge drinking (11.2% vs 7.0%, $P=.008$) and be CAGE positive (8.5% vs 5.4%, $P=.02$), but not to report a lifetime history of a drinking problem (8.4% vs 8.0%, $P=.81$).

COMMENT

A relatively large proportion of elderly primary care patients in this study reported drinking in excess of recommended limits. Moderately heavy drinking, such as 2 to 3 drinks per day, clearly increases the risk of hypertension[14-17] and probably also increases the risk of several other conditions such as diabetes,[31] breast cancer,[18-20] head and neck cancers,[20] and hip fracture.[32-34] Because this level of alcohol use increases the risk of medical conditions, it must be considered medically hazardous. Both moderately heavy and more severe problem drinking were quite common in this sample, especially among older men. The frequency of heavy alcohol use, binge drinking, and CAGE positivity seen here clearly warrants screening older primary care patients for these problems. Our findings, however, suggest that commonly recommended screening instruments that are designed to detect alcohol abuse or alcoholism, such as the CAGE, are insufficient to detect the full spectrum of problem drinking seen in a primary care population.

How should we screen our patients for alcohol problems? Although recommended by the US Preventive Services Task Force,[35] screening for alcohol problems is often neglected by primary care physicians.[36] Time constraints and lack of training in screening techniques contribute to this neglect. Physicians may also feel discouraged after encounters with severely dependent alcoholics who are refractory to treatment efforts. Because of time constraints, many physicians use self-administered questionnaires to increase the efficiency of preliminary medical and social history taking. This study demonstrates that it is practical in busy primary care practices to embed alcohol screening questions in such a questionnaire to detect potentially harmful drinking among patients. Previous studies have shown that the CAGE questionnaire is sufficiently sensitive and specific to screen older people for a diagnosis of alcohol abuse or alcoholism as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition*.[11,37,38] Using a cutoff score of 1 affirmative answer increases the sensitivity of the CAGE, with 86% to 88% of alcoholics detected.[11,37] In the primary care setting, a cutoff of 1 positive response may be the most practical. The consequences of a false-positive test result in this setting are not grave; in fact, they may lead to a beneficial discussion of what drinking practices are harmful and what are not. While the CAGE questions are useful, however, this study suggests that the CAGE alone is not sufficient to detect hazardous drinking in the primary care setting. People who consume more than 21 drinks per week or more than 5 drinks per occasion are at an increased risk of several health problems. In this sample, the CAGE detected fewer than half of these heavy drinkers. Questions on the quantity and frequency of drinking that are designed to detect both regular heavy drinking and binge drinking should also be included to maximize the number of problem drinkers detected.

All people should be asked about their drinking, but we should be aware that certain groups of people are more likely to be problem drinkers. In this study, men, college graduates, and married people were more likely to drink heavily, associations that have been shown in other studies of older people and alcohol use.[39,40] Among people aged 61 to 65 years, those who had retired were more likely than those who were still employed to drink heavily and to screen positive on the CAGE questionnaire. Although this study cannot identify whether there is a causal relationship between retirement and hazardous drinking, it does suggest that physicians should be especially alert to the potential for harmful alcohol use among people in this age group who have retired. Although the effect of retirement on drinking practices has not been studied extensively, in the Normative Aging Study men who had retired had a slightly higher incidence of drinking problems than those who had not.[41]

The sample size and setting offer important advantages. This is the largest sample of elderly primary care patients to be screened for problem drinking. It

is also the first study in the United States to be done in the private practice setting, away from the selection bias inherent in clinics affiliated with medical schools or with the US Department of Veterans Affairs. Some limitations, however, should be borne in mind. Our method of case finding selected only those patients who were willing and able to fill out a questionnaire in their physicians' offices. Those who were cognitively impaired or severely ill would not have been included, nor would those alcoholics who deny their problem drinking. We have very little information about the nonparticipants. Inferences may therefore be made only about patients who can be identified by this method. Generalizability is also limited by the small number of nonwhite participants. A number of factors may have led to an underestimate of alcohol use or the number who were CAGE positive. Although self-report of usual alcohol use is quite reliable,[40] it may give a lower estimate of alcohol consumption than diary methods among elderly people.[42,43] Also, we were not able to quantify ounces of alcohol consumed; some people may use the nonquantitative term "glass" or "bottle" to underreport their alcohol use. In 1 previous study, asking the CAGE questions after asking quantity and frequency questions decreased the proportion of patients who were CAGE positive.[44]

As physicians, we have a responsibility to detect and intervene with problem drinkers in our practices. We should assist them in weighing the risks of hazardous drinking and advise them about safer drinking habits. Brief counseling interventions have been shown to decrease problem drinking in primary care settings significantly.[24,45] Moderately heavy drinkers, who are at increased risk of several medical conditions, are particularly receptive to such interventions. To address more severe problem drinking, physicians may need to adopt a different strategy. Besides pointing out the harmful consequences of their drinking behavior and the benefits of safer drinking habits, formal treatment programs may be needed to help those who abuse alcohol severely or are dependent on it.

In summary, a substantial proportion of elderly primary care patients consume alcohol in excess of recommended limits. The magnitude of this problem warrants regular screening in physicians' offices. Screening questions can successfully be embedded in a self-administered history-taking questionnaire, such as many physicians regularly use. It appears that a combination of screening tools, including questions on quantity and frequency of drinking as well as the CAGE questionnaire, should be used to maximize the number of problem drinkers detected.

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