

### Comparison of AUDIT and CAGE questionnaires in screening for alcohol use disorders in elderly primary care outpatients

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Alcohol use disorders (AUD) can be destructive in the elderly because of drug interactions, higher blood alcohol levels per amount consumed, and limited functional reserve. However, physicians diagnose only about 30% of elderly with AUD. The objective of this study was to screen for AUD in rural elderly family medicine outpatients using the Alcohol Use Disorders Identification Test (AUDIT). A survey of all presenting patients aged 65 years or older who consented (N=93) was done in four family practices in Southeast Ohio. Measurements included the CAGE and AUDIT questionnaires. On the AUDIT, 13 subjects (14.0%), [10 men, 3 women], screened positive for AUD, scoring 5 or more points, and seven subjects (7.5%) [six men, one woman] screened positive for AUD, scoring 8 or more points. On the CAGE, five men (5.4%) but no women screened positive ( $\geq 2$  affirmatives). The prevalence of AUD found in this survey (5.4% to 14.0%) is consistent with previous studies. Based on these findings, the AUDIT may be a useful screening instrument in the elderly population.

(Key words: Elderly, geriatrics, alcoholism, rural, outpatients, mass screening, CAGE, AUDIT)

Up to 3.5 million elderly, aged 65 or older with alcohol use disorders (AUD), including abuse and dependence, may be expected in the United States by the year 2030, as the elderly will represent approximately 20% (70 million) of the entire US population by that time.<sup>1</sup> Previous studies<sup>2-4</sup> have suggested a prevalence of alcohol abuse and dependence of 3% to 5% in the geriatric community. The National Institute of Alco-

hol Abuse and Alcoholism (NIAAA) defines excessive alcohol consumption as more than 14 drinks per week for men and more than 7 drinks per week for women.<sup>5</sup> Compared with younger populations, atypical physical and psychological consequences of AUD predominate in the elderly and can be more significant.<sup>6</sup> These include a higher potential for drug interactions, with an estimated 4.5 medications used per elderly patient at any given time;<sup>7</sup> higher plasma alcohol levels and greater vulnerability for toxicity because of a smaller volume of distribution; and a higher tendency for loss in cognitive, physical, and psychological functioning related to limited reserves.<sup>8</sup> Despite these factors, studies have shown that physicians diagnose alcohol abuse and dependence in only a minority of elderly patients with known AUD.<sup>9-12</sup>

Primary care physicians may be in a

most opportune position to identify those elderly patients with AUD because of the higher prevalence (5% to 33%) of such abuse seen in the elderly in various outpatient medical settings.<sup>13-15</sup> The Alcohol Module of the Diagnostic Interview Schedule<sup>16</sup> is often used as the gold standard in AUD studies, but its applicability to geriatric patients may be limited for the following reasons:

- The module emphasizes social and occupational consequences less frequently encountered in this population, as retirement and familial losses take center stage; and

- Some of the criteria are based on tolerance or withdrawal that are often difficult to assess in the elderly.<sup>17</sup>

The Alcohol Use Disorders Identification Test (AUDIT)<sup>18</sup> from the World Health Organization may be useful in the elderly. The AUDIT emphasizes quantity and frequency of alcohol consumption, rather than those consequences screened for in AUD that may not be seen in this population. Studies<sup>19-20</sup> using the AUDIT in elderly subjects have found mixed results using the recommended cutoff of 8 or more points;<sup>21-23</sup> however, in the family practice setting, 5 or more points has also been suggested.<sup>22</sup> The aim of this pilot study was, therefore, to test and validate the AUDIT screening instrument in estimating the prevalence of alcohol abuse and dependence in rural elderly primary care outpatients.

#### Materials and methods Subjects and setting

Over a 6-week period in March and April 1996, all patients aged 65 years or older who presented to four family practice offices in Athens and Meigs counties in rural Southeastern Ohio were approached to participate in the study. Subjects were excluded if they were unable to effectively communicate and no immediate family member was able to complete the survey; they refused; or a medical or psychological condition existed such that it was detrimental to the patient (as determined by their physician) to participate.

Basic demographic data were recorded for all patients excluded, as well as

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## Checklist

- Have you ever felt you should **Cut** down on your drinking?
- Have people **Annoyed** you by criticizing your drinking?
- Have you ever felt bad or **Guilty** about your drinking?
- Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (**Eye-opener**)?

Scoring: Two or more positive responses have sensitivity and specificity of 70% and 91%, respectively.

Figure. CAGE questionnaire.

reasons for nonparticipation. Subjects were approached by trained research assistants with written guidelines who were instructed to greet all subjects in a similar manner. Subjects were told the investigation concerned "social attitudes and habits of the rural elderly" and that participation was completely voluntary. Patients completed the surveys before seeing their physician. The Institutional Review Board of Ohio University approved this study, and a signed consent form was required of all subjects.

### Survey instruments

This study used a questionnaire that included the two following screening instruments:

■ The well-studied CAGE (Figure) instrument<sup>24</sup> has been validated for use in the elderly. With two or more positive responses to the four questions as the cutoff, CAGE has a sensitivity and specificity of 70% and 91%, respectively, for identifying subjects in the elderly population thought to have AUD.

■ The AUDIT is a 10-question screening instrument followed by a brief clinical evaluation. The brief clinical evaluation was not utilized in this study because the AUDIT has been found to be effective

The following questions are about the past year:	Points
<b>1. How often do you have a drink containing alcohol?</b>	
Never	0
Monthly or less	1
2 to 4 times a month	2
2 to 3 times a week	3
4 or more times a week	4
<b>2. How many drinks containing alcohol do you have on a typical day when you are drinking?</b>	
None	0
1 or 2	1
3 or 4	2
5 or 6	3
7 or 9	4
10 or more	5
<b>3. How often do you have six or more drinks on one occasion?</b>	
Never	0
Less than monthly	1
Monthly	2
Weekly	3
Daily or almost daily	4
<b>4. How often have you found that you were unable to stop drinking once you had started?</b>	
Never	0
Less than monthly	1
Monthly	2
Weekly	3
Daily or almost daily	4
<b>5. How often have you failed to do what was normally expected from you because of drinking?</b>	
Never	0
Less than monthly	1
Monthly	2
Weekly	3
Daily or almost daily	4

alone without this additional procedure.<sup>25</sup> The AUDIT addresses the quantity and frequency of alcohol consumed, the presence of blackouts, binge drinking (more than 6 drinks per day), and the inability to control drinking (Table 1). A suggested cutoff of 5 or more and 8 or more points was recorded in this study. Quantity and frequency of cigarette consumption, demographic information, and other factors that may put the elderly at risk for AUD were also included in the questionnaire. All information was recorded by individually assigned code

numbers and kept strictly confidential. Descriptive data were compiled and charted for presentation. Statistical analysis was done using a two-tailed Student t-test and Chi-square for comparison of subjects and nonparticipants ( $\alpha = .05$ ).

### Results

Of 202 elderly primary care outpatients approached, 93 agreed to participate in the survey, and 109 refused. Disinterest and lack of time accounted for 94.5% of the reported reasons for nonparticipation. Men represented 35.5% of partic-



**Table 1**  
**Alcohol Use Disorders Identification Test (AUDIT)**  
 (continued)

The following questions are about the past year.	Points
<b>6. How often have you needed a first drink in the morning to get yourself going after a heavy drinking session?</b>	
Never	0
Less than monthly	1
Monthly	2
Weekly	3
Daily or almost daily	4
<b>7. How often have you had a feeling of guilt or remorse after drinking?</b>	
Never	0
Less than monthly	1
Monthly	2
Weekly	3
Daily or almost daily	4
<b>8. How often have you been unable to remember what happened the night before because you had been drinking?</b>	
Never	0
Less than monthly	1
Monthly	2
Weekly	3
Daily or almost daily	4
<b>9. Have you or someone else been injured as the result of your drinking?</b>	
No	0
Yes, but not in the last year	2
Yes, during the last year	4
<b>10. Has a relative, friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?</b>	
No	0
Yes, but not in the last year	2
Yes, during the last year	4

ipants and 38.5% of nonparticipants; whereas, women made up 64.5% and 61.5%, respectively ( $\chi^2 = .09, p = .760$ ). The mean age of participants ( $73.0 \pm 6.6$  years) did not significantly differ from nonparticipants ( $74.9 \pm 7.3$  years;  $t = 1.83, p = .070$ ). No significant difference was seen between young-old (65 years to 74 years), middle-old (75 years to 84 years) and old-old (85 years and older) age groups ( $\chi^2 = 4.57, p = .100$ ). Whites made up 100% of both participating subjects and nonparticipants (Table 2).

Current cigarette smoking was seen in 13 (14.1%) subjects; 32 (34.8%) had

quit, and 47 (51.1%) were abstainers. The mean number of medications (over the counter and prescription) reported was  $2.49 \pm 1.84$  (range 0 to 8). Twelve subjects reported taking no medications. Fifty-two subjects (55.9%) reported never having consumed alcohol; 28 (30.1%) participants had quit, and 13 (14.0%) subjects were present drinkers. Among the 41 present or past drinkers, two women (4.9%) reported consuming more than 7 drinks per week. Seven men (17.1%) reported consuming more than 14 drinks per week. The CAGE, with two or more points (positive responses), identified five men (5.4%) but no

women with AUD. The AUDIT identified seven subjects (7.5%) (6 men, 1 woman) with AUD at a cut-off score of 8 or more points; however, at a cutoff of 5 or more points, 13 subjects (14.0%) (10 men and 3 women) were identified (Table 3). Seven of 41 subjects (17.1%) reported a history of alcohol consumption; yet they answered "never" to the question on the frequency of drinking before completing the rest of the survey.

AUDIT-positive scores at both cut-off points were seen most frequently in the young-old (65 years to 74 years), with fewer seen in the middle-old (75 years to 84 years), and none in those 85 or older. Of elderly men, 21.2% and 33.3% were AUDIT-positive, with a cut-off of 8 and 5 points, respectively. Only 1.6% and 3.3% of female subjects screened positive with these scores. AUDIT-positive scores with cutoffs of 8 and 5 points, respectively, were found in 9.4% and 18.8% of exsmokers and 0.0% and 4.2% of those who had never smoked. Of those current smokers, 38.5% were AUDIT-positive, all scoring 8 or more points (Table 4).

## Discussion

Alcohol use disorders are under-diagnosed and under-treated in the elderly. A higher prevalence of AUD seen in geriatric outpatients (5% to 33%) than in the general population (3% to 5%) suggests that the primary care physician is in a most opportune position to screen, diagnose, and begin to treat AUD in the this patient population. The goal of this study was to test and validate the AUDIT in elderly primary care outpatients by comparing it with the well-known CAGE questionnaire.

Although statistically matched by age and gender, a large number of patients refused to participate in the study. This refusal to participate might be explained by the requirement to sign a consent form. Similarly, subject minimization or denial when confronted with questions regarding personal habits may also have contributed to refusing to participate. Denial is also one possible explanation for the 17.1% of subjects who reported present or past drinking, but then went



on to answer "never" to the next question on the frequency of drinking. Given these factors, the possibility of an even higher prevalence of AUD in the patients refusing to participate must also be considered.

The prevalence of subjects in this study who reported never having consumed alcohol is consistent with the 31% to 58% reported in previous studies.<sup>26</sup> The lifetime prevalence of AUD in elderly rural primary care outpatients identified by both screening mechanisms in this study is consistent with earlier studies.<sup>13-15</sup> However, a sizable difference in prevalence was seen between the CAGE (5.4%) and AUDIT (7.5% and 14.0% at cut-off scores of 8 and 5, respectively). Furthermore, AUDIT-positive men reported having a mean of 19.0 and 25.8 drinks per week, based on a cutoff of 5 and 8 points, respectively. Similarly, AUDIT-positive women reported having a mean of 10.0 and 16.0 drinks weekly, based on a cutoff of 5 and 8 points, respectively. CAGE-positive subjects (all men) reported a mean of 25.6 drinks per week. Excessive alcohol consumption, as defined by the NIAAA,<sup>27</sup> was seen in AUDIT-positive subjects accordingly: 60.0% of men and 66.7% of women scoring 5 cut-off points and 83% of men and 100% of women scoring 8 cut-off points. No excessive alcohol consumption was seen in AUDIT-negative subjects scoring at both cut-off levels. Indeed, questions regarding quantity and frequency of alcohol consumption garnered 73.9% of all AUDIT points. Four of the five CAGE-positive men reported excessive drinking, with one man answering "never" to the quantity of alcohol question. However, both women (100%) who reported excessive consumption were found to be negative for AUD when screened by CAGE. In this population, the AUDIT, with a cutoff of both 5 and 8 or more points, seems to screen for AUD earlier in the course of the disease than does the CAGE. This earlier detection may be especially significant in elderly women with excessive alcohol consumption who have been undetected by the CAGE instrument. Sever-

Demographics	Participants		Refusers		<i>p-value</i>
	No.	(%)	No.	(%)	
<b>Age, y</b>					
65—74	50	(54.9)	66	(63.5)	
75—84	29	(31.9)	33	(31.7)	
85+	12	(13.2)	5	(4.8)	
Total	93	(100.0)	104	(100.0)	.105
<b>Sex</b>					
Male	33	(35.5)	42	(38.5)	
Female	60	(64.5)	67	(61.5)	
Total	93	(100.0)	109	(100.0)	.070

Screening method (Cut-off points)	Participants			
	Positive-screen		Negative-screen	
	No.	(%)	No.	(%)
CAGE ( $\geq 2$ positives)	5	(5.4)	88	(94.6)
AUDIT ( $\geq 8$ points)	7	(7.5)	86	(92.5)
AUDIT ( $\geq 5$ points)	13	(14.0)	80	(86.0)
*NIAAA (excessive use)	9	(9.7)	84	(90.3)

\* The National Institute of Alcohol Abuse and Alcoholism

al reasons may explain why AUDIT may detect AUD earlier than CAGE:

■ The questions making up the CAGE survey social and occupational factors that may no longer apply to the elderly in light of retirement, isolation, and spouse death, for example.

■ The AUDIT may have a higher sensitivity for AUD given that it includes questions with regard to quantity and frequency of consumption. Given the low level of identification of AUD in this population and the ease of follow up of positive-screened patients, the possibility of more false-positives with the AUDIT seems justifiable.

■ There are inherent limitations found in a small study population; and the chosen cut-off scores may have influenced the results.

Further studies using the AUDIT in rural elderly medical out-patients need to be done to determine the sensitivity and specificity of the AUDIT in this population.

### Comment

As the elderly population in the United States steadily grows, primary care physicians will play an increasingly important role in screening, diagnosing, and treating AUD in this population. As such, a thorough knowledge of the prevalence and atypical and nonspecific consequences of AUD in the elderly, along with improved screening methods, is becoming increasingly important. The AUDIT warrants further investigation as a screening instrument in the elderly because it includes questions regarding



**Table 4**  
**AUDIT Scores\* and Associated Demographics of Elderly Primary Care Outpatients**

Demographics	AUDIT-negative		AUDIT-positive	
	No.	(%)	No.	(%)
<b>Age, y</b> (n=91)				
65-74	40	(44.0)	10	(11.0)
75-84	27	(29.7)	2	(2.2)
85+	11	(12.1)	1	(1.1)
<b>Sex</b> (n=93)				
Male	23	(24.7)	10	(10.7)
Female	57	(61.3)	3	(3.2)
<b>Smoking</b> (n=92)				
Current	8	(8.7)	5	(5.4)
Quit	26	(28.3)	6	(6.5)
Never	45	(48.9)	2	(2.2)

\*Cut-off points  $\geq 5$

the quantity and frequency of alcohol consumption; it does not rely on those consequences of AUD seen primarily in younger populations; it (possibly) has a higher sensitivity than previous screening methods, allowing for earlier assessment, especially in women; and it may be administered easily.

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