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Prevalence and identification of alcohol use disorders among nonpsychiatric inpatients in one general hospital

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Abstract

Alcohol use disorders (AUDs) are common among inpatients in general hospitals and often cause excess mortality. This study investigates the prevalence of AUDs among nonpsychiatric inpatients in one general hospital and evaluates the ability of medical staff to identify such morbidity. A two-phase case-identification strategy was employed utilizing the Alcohol Use Disorders Identification Test as the first-phase screening tool and the Schedules for Clinical Assessment in Neuropsychiatry as the second-phase diagnostic interview. Among 538 eligible patients, a total of 422 (78.4%) completed the first-phase screening. A subsample (20%) of those screened negative and 90% of those screened positive were interviewed at the second phase. The weighted 1-year prevalence rates of alcohol abuse and alcohol dependence were 3.9% and 12.6%, respectively. The overall identification rate of AUDs by medical staff was 25.4% (0% for alcohol abuse and 30% for alcohol dependence). In conclusion, approximately one sixth of nonpsychiatric inpatients in a general hospital have AUDs and have been neglected substantially by medical staff. Implications of the findings for the prevention of AUDs and their physical complications are discussed.

Keywords: Alcohol use disorders; Two-phase design; Screening; Prevalence

1. Introduction

Alcohol use disorder (AUD) has a major impact on public health [1]. In 2000 AUD was the fourth leading disease accounting for 3.5% of the life loss measured as disability-adjusted life-years in developed countries [2] and may cause various physical illnesses and accidents [3]. Patients visiting general hospitals have been shown to have an increased risk of having AUDs, with a prevalence rate ranging from 10.0% to 32.1% [4–12]. However, most did not seek treatment for AUDs per se.

There have been wide variations in methodology that make these studies hardly comparable. Several studies used only screening questionnaires [10,12], chart reviews [12], or physician's clinical judgment [11] to obtain diagnoses of AUDs. The lack of standardized diagnostic interview may lead to less precise estimation in prevalence of AUDs. With the development of the standard two-phase case-finding research strategy in psychiatric epidemiology, researchers can now use a simple, valid, and economic screening tool in the first phase among a large number of subjects and conduct standardized clinical interview for a much smaller subsample in the second phase [13–15] to generate weighted prevalence estimates. However, when a two-phase design was employed, some previous studies did not sample those who were screened negative for the second-phase interview [9], or did not apply an appropriate weighting procedure to estimate the prevalence [8].

Although a high prevalence of AUD among general hospital inpatients has been reported, such morbidity remains largely neglected by the medical staff, with identification rates ranging from 7% in some specialty departments to 89% in a whole general hospital [6,8,10,16]. The wide variations in the identification rate of AUDs by medical

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staff in general hospital settings may be attributable to different medical staff in different departments [6,10], and differences in case definition and case identification method [16]. However, another possible attribution that has rarely been examined is the relative unawareness of AUD in general hospitals in countries where such morbidity was previously not a serious problem.

Taiwanese society has been considered to have relatively low prevalence of AUDs [17,18]. Although there have been no comparable epidemiological studies across different times, few studies conducted in recent years suggest an increase in the prevalence of AUDs in Taiwan, both in Taiwanese Han [19] and aborigines [20]. In particular, Taiwan has steadily opened its market to foreign alcohol beverage since 1990. The average per capita alcohol consumption in Taiwan in 1996–2000 [21] was 30% higher than that in 1981–1985 [22]. Thus, it is important to reevaluate AUDs and alcohol-related problems. The aims of this survey are to investigate the prevalence of AUDs among nonpsychiatric inpatients in one general hospital, and to evaluate the ability in the identification of AUDs by medical staff.

2. Methods

2.1. Study subjects

Study subjects were drawn from a 544-bed district general hospital in Taipei City, the Taipei Municipal Chung-Hsiao Hospital. All inpatients aged 18 to 65 years, except those admitted in intensive care units and pediatric, gynecologic, obstetric, psychiatric, and hospice departments, were identified from the admission registry system to form a sampling frame. Every one in two from the sampling frame were randomly selected and invited to participate in the study within 3 days after admission. A total of 538 patients were thus recruited during the study period. All the participants were informed that the aim of the study was to investigate their health behaviors and physical conditions. Patients with poor cognitive function, too ill to complete the questionnaire, or who refused participation in the study were excluded.

2.2. Measures

This study employed the two-phase case identification strategy using a Chinese version of the Alcohol Use Disorders Identification Test (AUDIT) [23] for the first phase and a Chinese version of the Schedules for Clinical Assessment in Neuropsychiatry (SCAN) [24] for the second phase.

2.2.1. Chinese version of the AUDIT

The AUDIT is composed of 10 questions, including three quantity-frequency questions, three alcohol-related behaviors questions, and four alcohol-related consequences or harm questions. Every AUDIT question scores from 0 to 4 based on respondent's drinking quantity and frequency of occurrence of alcohol-related problems. With the exception of the last two items, the AUDIT focuses on the past 1 year. The last two items inquire about alcohol-related problems and have a higher weight for occurrence in the past year and a lower weight for occurrence ever. The first question on alcohol consumption history inquires whether the patient "ever" drank. If the response is "yes," the respondents were then asked the rest of the items. If the response is "no," all the AUDIT items are assumed to be zero in score.

A translation and back-translation procedure was carried out for the Chinese version of the AUDIT, with psycholinguistic modifications. In order to increase its sensitivity (identifying more cases), the cut-off point was set at 6, which is lower than the 8 or 10 adopted in most previous studies [23,25]. According to the AUDIT scores, respondents at phase one were divided into three strata, i.e., screened negative with zero score, screened negative with nonzero scores, and screened positive.

2.2.2. Chinese version of the SCAN

The SCAN has been developed as a comprehensive instrument for the assessment and classification of psychiatric disorders in adults through semi-structured interviewing [24]. The development of the Chinese version of the SCAN included a two-stage translation, focus group discussion, field trial, and study of clinical case histories. Further modification of the SCAN items has carefully considered several cross-cultural psycholinguistic equivalents. The cross-cultural inter-rater reliability between US/UK SCAN experts and the Taiwanese SCAN users was found to be acceptable, with 75–100% agreements at item level and 69–100% agreement at section level [26].

2.3. The survey

The study was conducted from June 9 to August 30, 2002. In the first phase, a questionnaire inquiring demographic characteristics, types of admission, and history of tobacco and alcohol consumption was conducted by experienced nurses after obtaining participants' written informed consent. The types of admission were based on patients' major diagnoses on chart. The tobacco use history inquired about the quantity and frequency of smoking. The AUDIT was contained in the alcohol consumption history.

Among 538 eligible patients, 422 (78.4%) completed the first-phase screening. Among the 116 patients who failed to complete, 10 had poor cognitive function, 7 were too ill to complete, 78 were discharged before the conduct of the study, and 21 refused to participate. There was no significant difference in the distribution by age, gender, or department being admitted between subjects who completed the first-phase screening and those who did not. Among the 116 patients who failed to complete the screening, 12 were admitted for trauma-related diseases and none had an alcohol-related diagnosis on the basis of chart review.

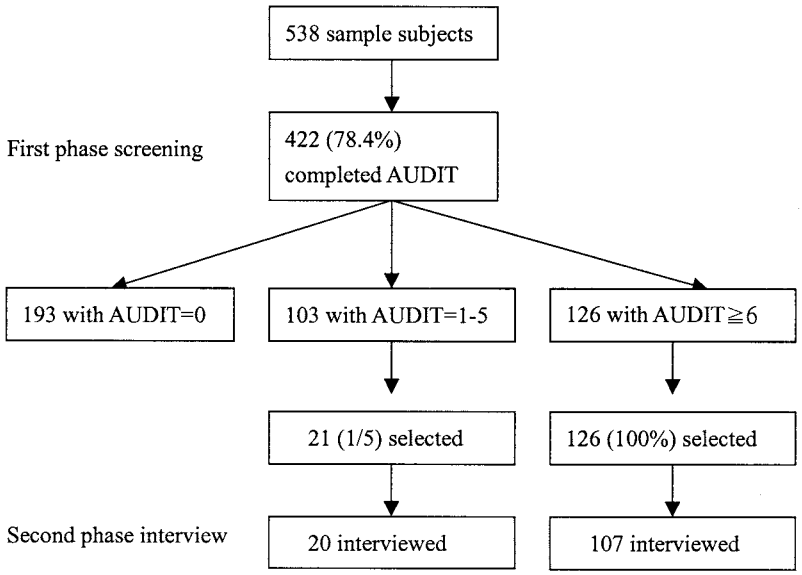

Fig. 1. Flow chart of the two-phase case identification for alcohol use disorders among nonpsychiatric inpatients in one general hospital in Taiwan.

All screened positive respondents ($n=126$) and 20% of those screened negative with nonzero scores randomly selected ($n=21$) entered the second phase for the SCAN assessment within 3 days after the first phase screening to provide current *DSM-IV* diagnoses of AUDs [27]. The assessment was conducted by a psychiatrist (CHC) using section 11 (use of alcohol) of the SCAN 2.1 version. Chen had received a standard SCAN training course in advance and the inter-rater reliability between him and the corresponding author (ATAC) among eight subjects was acceptable, with κ values at item level ranged from 0.75 to 1.00, and the percentage agreement on normal/abuse/dependence was 100%. The interviewer was blind to the respondents' AUDIT scores. Because subjects with a zero score of AUDIT indicate that they did not drink any alcohol in the past year, none were selected for the second-phase diagnostic interview. Among the 147 patients who were selected into the second phase, 19 screened positives and one screened negative with nonzero score did not complete the SCAN interview due to discharge or rejection (see the flow chart in Fig. 1). The response rate at phase two was 86.4% (127/147). There was no significant difference in the distributions of demographic characteristics, types of admission, and AUDIT scores between respondents and nonrespondents in the screened positive group. The sampling weight is 103/20 and 126/107.

The identification of AUDs by medical staff was assessed by reviewing their medical records after discharge. Patients were judged as having been identified to have alcoholic disorders by the medical staff if (a) their diagnoses included alcohol-related disorders (e.g., alcoholic liver disease, alcoholic gastritis, etc.); (b) their medications during admission included detoxification agents (e.g., benzodiazepine to prevent withdrawal symptoms); (c) they had received consultation-liaison for drinking problems.

2.4. Statistical analysis

Descriptive statistics were used to show the characteristics of participants and the distribution of AUDIT scores. Because this study has employed the two-phase design, weighted prevalence estimates and their 95% confidence intervals (CI) of AUDs were calculated using the command (*svymean*) of Stata 7.0 software package [28]. Under the assumption that patients with AUDIT=0 may not have current AUDs if an interview is conducted, they were treated as noncases in the estimation of the prevalence of AUDs, and the sampling weight is set to be 1 in this stratum.

Covariates that appropriately dichotomized were put into the model as independent variables and the status of AUDs was treated as the dependent variable. Various correlates for AUDs were analyzed by weighted logistic regression using command (*svylogit*). Univariate weighted logistic regression analysis was performed to test the significance of each covariate for AUDs. Correlates that were significantly associated with the status of AUDs in univariate analysis were further put into multivariate logistic regression analyses. The associations between the identification status and various correlates were assessed using either χ^2 or Fisher's exact test. Differences in mean scores between the identified and the nonidentified groups were tested by t test. All statistics are treated as significant if $P<.05$.

3. Results

3.1. Characteristics of respondents

Respondents consisted of 268 (63.5%) men and 154 (36.5%) women. Their mean age was 42.5±13.3 years (men

Table 1
Weighted 1-year prevalence (%) of alcohol use disorders among general hospital inpatients

	Alcohol abuse (95% CI)	Alcohol dependence (95% CI)	Total (95% CI)
Gender			
Male (n = 268)	4.7 (2.0–7.4)	17.5 (13.1–21.9)	22.2 (17.5–26.8)
Female (n = 154)	2.4 (0.0–5.1)	3.2 (0.1–6.3)	5.6 (1.7–9.6)
Age			
18–44 (n = 224)	5.4 (2.2–8.6)	16.2 (11.3–21.2)	21.6 (16.3–27.0)
45–65 (n = 198)	2.3 (0.1–4.5)	8.6 (4.6–12.7)	10.9 (6.6–15.3)
Types of admission			
Internal medicine (n = 169)	2.1 (0.0–4.5)	22.5 (16.1–28.8)	24.6 (18.1–31.0)
Other departments (n = 253)	5.1 (2.2–8.0)	6.0 (2.9–9.1)	11.1 (7.2–15.0)
Total (n = 422)	3.9 (2.0–5.8)	12.6 (9.7–15.4)	16.5 (13.6–19.3)

41.9±12.9 and women 43.7±13.9). Men were significantly more likely to be employed, ever-smokers, never married, and surgical inpatients than women. There was no significant difference between genders in distribution of age and education.

3.2. Distribution of AUDIT scores

The total score of AUDIT ranged from 0 to 37 in men and 0 to 18 in women. The proportion of screened negatives at a cut-off point of 5/6 was 59.0% in men and 89.6% in women (70.1% in total group). The number of screened negatives with zero, screened negatives with nonzero scores, and screened positives was 193 (45.7%), 103 (24.4%), and 126 (29.9%), respectively.

3.3. Weighted 1-year prevalence of AUDs

Fourteen patients had alcohol abuse and 45 patients had alcohol dependence. All had an AUDIT score above the cut-off point. The weighted 1-year prevalence rates (95% CI) of alcohol abuse and alcohol dependence were 3.9% (2.0–5.8%) and 12.6% (9.7–15.4%), respectively (Table 1). Rates of AUDs were significantly higher in men than in women (z=4.33, P<.0001), in younger than in older respondents (z=2.97, P<.001), and in subjects admitted to Department of Internal Medicine than in subjects admitted to other departments (z=2.77, P<.01).

3.4. Sociodemographic and other correlates of AUDs

The correlation between AUDs and smoking status, gender, age, education, occupation, and types of admission was first examined by univariate weighted logistic regression analysis (Table 2). The odds ratios (ORs) were significantly higher among subjects with a smoking history, men, the younger, the less-educated, and inpatients in internal medicine. In multivariate weighted logistic regression analysis with these variables, the model of best fit included independent effects of smoking status, age, education, and types of admission (Table 2). The ORs were significantly higher among the younger age group, the less-educated, subjects with a smoking history, and inpatients in internal medicine.

3.5. Identification of AUDs by medical staff

The overall identification rate of patients with AUDs by medical staff was 25.4% (15/59) (Table 3). All 15 patients identified had alcohol dependence, and none was only with alcohol abuse. Table 3 illustrates the association between

Table 2
Univariate and multivariate logistic regression analysis of alcohol use disorders among general hospital inpatients

	Alcohol use disorders			
	Univariate analysis		Multivariate analysis	
	OR	95% CI	OR	95% CI
Smoking status				
Never smoke	1.0		1.0	
Ever smoke	11.2	4.2–29.5	10.2	2.5–41.8
Gender				
Female	1.0		1.0	
Male	4.7	2.0–11.1	2.1	0.6–7.6
Age (y)				
45–65	1.0		1.0	
18–44	2.2	1.2–4.2	5.4	2.2–14.2
Marital status[a]				
Nonmarried	1.0		–	
Married	0.5	0.3–1.0	–	
Education (y)				
>9	1.0		1.0	
≤9	2.4	1.3–4.3	3.9	1.8–8.4
Occupation[b]				
At work	1.0		–	
Jobless	1.6	0.8–3.6	–	
Types of admission				
Other departments	1.0		1.0	
Internal medicine	2.6	1.4–4.8	5.3	2.4–11.8

OR = odds ratio; 95% CI = 95% confidence interval.
[a] Nonmarried include ever and never married.
[b] At work include students and housewives; jobless include the unemployed and the retired.

Table 3
Identification of alcohol use disorders by medical staff: associated factors

	Identification of alcohol use disorders		
	Yes (n = 15)	No (n = 44)	Total (n = 59)
	n (%)	n (%)	n (%)
Smoking status			
Ever smoke	14 (93.3)	40 (90.9)	54 (91.5)
Never smoke	1 (6.7)	4 (9.1)	5 (8.5)
Gender			
Male	15 (100)	37 (84.1)	52 (88.1)
Female	0 (0.0)	7 (15.9)	7 (11.9)
Age (y)			
18–44	12 (80.0)	28 (63.7)	40 (67.8)
45–65	3 (20.0)	16 (36.3)	19 (32.2)
Marital status[a]			
Married	9 (60.0)	25 (56.8)	34 (57.6)
Nonmarried	6 (40.0)	19 (43.2)	25 (42.4)
Education (y)			
≤9	10 (66.7)	25 (56.8)	35 (59.3)
>9	5 (33.3)	19 (43.2)	24 (40.7)
Occupation[b]			
Jobless	4 (26.7)	8 (18.2)	12 (20.3)
At work	11 (73.3)	36 (81.8)	47 (79.7)
Types of admission*			
Internal medicine	14 (93.3)	21 (47.7)	35 (59.3)
Other departments	1 (6.7)	23 (52.3)	24 (40.7)

[a] Nonmarried include ever and never married.
[b] At work include students and housewives; jobless include the unemployed and the retired.
* Fisher's exact test, $P < .05$.

sociodemographic and other factors and the identification of AUDs by medical staff. The only significant factor was the type of admission, which indicated that physicians in charge of inpatient care in internal medicine departments had a significantly higher detection rate for AUDs than their counterparts in other departments.

The mean score of the AUDIT among the identified patients (23.5, 95% CI=19.4–27.7) was significantly higher than that in the nonidentified patients (16.1, 95% CI=14.4–17.9). At item level, significant differences on scores between identified and nonidentified patients were observed for items 3 (frequency of having six or more drinks on one occasion), 4 (unable to stop drinking once started), and 6 (needed a first drink in the morning to get yourself going after a heavy drinking session).

3.6. Weighted validity of AUDIT

The weighted validity coefficients of AUDIT at a cut-off point of 5/6 against psychiatric diagnoses based on the SCAN interview were also computed with an appropriate rounding up of the sampling weight. All the figures for sensitivity (100%), specificity (84%), positive predictive value (56%), negative predictive value (100%), and misclassification rate (13%) are quite acceptable.

4. Discussion

4.1. Methodological considerations

The present study has employed the two-phase case-identification strategy, and a standardized semi-structured psychiatric interview (SCAN) was carried out by trained psychiatrist to assess alcoholism. The study subjects were representative of all nonpsychiatric inpatients in a general hospital during the study period. Despite these strengths, there are some limitations and potential bias in this study. First, the optimal fractions of the screened positive and the screened negative enrolled into the second-phase interview were not taken into consideration. It may reduce the efficiency of two-phase design, because the variance of weighted prevalence is as a function of sampling fraction [13]. However, if the prevalence of the target disorder is larger than 10%, the loss of efficiency due to the lack of optimal sampling fractions may be small [29]. Second, the potential bias due to drop-out in the first-phase screening might be minimal, because there was no difference in the distribution of age, gender, or departments being admitted. Third, the assumption that all patients with AUDIT=0 did not have any AUDs in the past year might have generated some false negatives if they were not excluded from being selected into the second-phase SCAN interview. This assumption may underestimate the prevalence of AUDs and overestimate the validity of AUDIT. In other words, some respondents with a score of AUDIT=0 may have denied any consumption of alcohol in the preceding 12 months when they actually did. However, none of the 20 nonzero screened negatives who entered the second-phase interview were found to have any AUDs. It is therefore believed that the probability for any of those with AUDIT=0 to have AUDs was very small. Fourth, the identification of AUDs by medical staff was determined by assessing their chart records rather than by a direct interview with them. Therefore, we may have underestimated the identification rate [16].

4.2. Prevalence of AUDs in nonpsychiatric inpatients: a comparison

The prevalence rates of AUDs found in this study was within the range of rates reported from Western studies [5–12]. Our weighted 1-year prevalence of AUDs (16.5%) was higher than the lifetime prevalence of AUDs (11.4%) found in one previous study similarly conducted in another general hospital in Taipei 17 years ago [7]. In addition to a possible secular increase, differences in case definition and case finding might also account for the disparity between the two studies. For example, no screening instrument and standardized psychiatric interview were employed in the earlier study.

The prevalence of alcohol dependence (12.6%) was much higher than that of alcohol abuse (3.9%) in this study.

The phenomenon is similar to the results of other studies conducted in medical settings [7–9,11]. This high presentation of alcohol dependence in medical settings implies that patients with alcohol dependence are more likely to have physical complications or accidents. On the other hand, alcohol-related problems among people with alcohol abuse may not be severe enough to warrant medical care.

The significant correlates of AUDs among general medical inpatients found in the present study have also been found in previous studies [5–7,9–11]. The lack of a significant effect from a male in our multivariate model might be attributable to the relative small size of female respondents with AUDs. The much higher proportion of inpatients with AUDs (largely alcohol dependence) in internal medicine departments can be explained by the fact that physical conditions among people with AUDs are more likely to be hospitalized in Taiwan. The prevalence of AUDs was highest in the gastrointestinal department (53.4%) among all departments, a phenomenon similarly observed in one study in a Western country [9].

4.3. Identification of AUDs by general medical staff

The overall identification rate of AUDs by medical staff in this study is close to the lower end of those found in previous studies [8,10,16]. Our low rate may have considerably derived from the definition of identification employed in this study. Previous work has demonstrated that physicians' identification rate for AUDs determined by indirect assessment of medical records is lower than that determined by interviewing physicians directly [16]. In one study, the identification rate of AUDs was 48.5% by diagnoses in patient records, 74.7% by notes in patient records, and 88.9% by interviewing the physician [16]. It is apparent that the identification rate of AUDs by medical staff in Taiwan (25.4%) is much lower than that by their Western counterparts with the same definition of identification. To some extent, such a disparity might be attributable to a widely distributed conviction that the Chinese seldom experience alcoholism.

Our finding that the only significant factor contributing to the detection of AUDs among nonpsychiatric inpatients was the type of admission (internal medicine or other department) is a replication of earlier studies [10,16] in non-Western societies. One plausible explanation is that most inpatients with AUDs in internal medicine are chronic alcoholics with severe symptoms that the medical staff often encounter. In this study, the highest AUDs identification rate (47.6%) was in gastroenterological departments.

4.4. Validity of AUDIT

Although the Chinese version of the AUDIT was not validated a priori, the weighted validity of this screening tool was found to be satisfactory. In previous reports, sensitivity of AUDIT at cut-off point 8 ranged from 61% to 96% and specificity from 85% to 96% [30]. Our slightly lower specificity (84%) might have come from the lower cut-off point used in this study. Validation study of AUDIT to find the optimal cut-off point is warranted in Taiwan in the future.

4.5. Implications for prevention

Because a substantial proportion of alcoholics often seek medical treatment for their physical complications rather than visit the psychiatric department for the treatment of alcoholism per se, the prevention of AUDs should focus on early detection and effective management of AUDs among medical patients. Such an effort may prevent not only the progression and relapse of many major physical conditions, but also various alcohol-related effects at an early stage of AUDs [31]. To achieve this will require an effective collaboration between psychiatric and medical professionals; and improvement in the identification of AUDs by medical staff is the first step in this endeavor. Findings in this study have indicated that medical staff in non-Western societies may have neglected AUDs among their patients much more than their Western counterparts, though the prevalence of such morbidity among nonpsychiatric inpatients might be similarly high across East and West. It is suggested that a high priority on public health should be given to the provision of training programs on alcoholism and associated psychiatric comorbidity for medical staff in developing countries.

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