

The incidence of alcohol-related problems and the risk of alcohol withdrawal in a general hospital population

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Abstract

A survey was carried out using the Canterbury Alcohol Screening Test (CAST) and clinical criteria for risk of alcohol withdrawal of 2000 randomly selected hospital in-patients in order to determine the prevalence of alcohol-related problems, the work-load for a specialist alcohol withdrawal service and the target group for early intervention. Patients at risk of alcohol withdrawal were followed prospectively.

The major findings were: 14.3% of patients had a positive CAST and 8% were at risk of alcohol withdrawal; the prevalence of positive clinical criteria was greatest in men under the age of 30 years (OR 3.6) and very low (OR 0.34) in women over 60 years. In addition, patients who were too sick or refused to complete the questionnaire had high rates of being at risk for alcohol withdrawal. The prevalence of CAST positivity was greatest in men under the age of 40 years (OR 3.7) and lowest in women over 70 years (OR 0.2).

It is concluded that 15-20% of in-patients have alcohol problems and 8% are at risk of withdrawal; questionnaires will produce underestimates of the order of 25%; and female in-patients over the age of 60 years are extremely unlikely to have problems with alcohol. [Foy A, Kay J. The incidence of alcohol related problems and the risk of alcohol withdrawal in a general hospital population. *Drug Alcohol Rev* 1995; 14:49-54.]

Key words: Alcohol abuse; alcohol withdrawal; screening; prevalence; hospital in-patients.

Introduction

In-patients in Australian general hospitals have been widely reported to have rates of hazardous alcohol use of between 20 and 40% [1-4]. This use is not evenly distributed, however, with general agreement that excessive consumption is 3-4 times more common among male patients than female [2,5] and significantly more common in urgent admissions compared to elective admissions [1,5].

Because of this level of use, and the perceived inadequate response to it, a strategic plan has

recently been developed for New South Wales for routine recording of alcohol use in in-patients and institution of an early intervention package where appropriate. In addition, in our hospital, the Newcastle Mater Misericordiae Hospital (NMMH) we have for some years operated a specialized nursing and medical service for the management of alcohol withdrawal since the high levels of use lead to a high incidence of withdrawal reactions in the wards of the hospital.

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In the study reported here, we carried out a survey of admissions over a 2-year period in order to estimate the size and demographic characteristics of the target group for early intervention and also, using previously published criteria for the risk of alcohol withdrawal, of the case-load for the specialized service.

By combining the use of a questionnaire designed to detect early problems and criteria of risk for one manifestation of physical dependence, we hoped to separate those patients in need of simple intervention from those in need of tertiary referral, and to obtain some measure of the accuracy of the questionnaire.

Since the study was carried out over 2 years as part of a prospective Quality Assurance project directed at our management of alcohol withdrawal, those patients identified as at risk could be followed during their admission to determine their incidence of complications. Finally, the numbers accumulating over 2 years would allow calculation of the risk ratios for the patient subgroups.

Methods and instruments

Canterbury Alcoholism Screening Test (CAST). This is a 30-item questionnaire designed for use with hospital in-patients to detect alcohol problems not necessarily medical in nature [6].

Clinical criteria for risk of withdrawal. These criteria have been published previously by us and are noted by direct observation or study of the case records [7]. They are:

- current admission with an alcohol-related diagnosis;
- past history of withdrawal;
- a blood alcohol level of ≥ 0.2 g% without impairment of consciousness; and
- consumption of > 100 g alcohol/day.

Patients were "criteria positive" if one or more criteria were present.

Patient admission/exclusion criteria. Consecutive admissions to the general medical or surgical wards were sampled using a random number table. Patients who were in need of resuscitation, aphasic, deaf, non-English speaking or with organic brain dysfunction were not given the CAST. All patients were assessed for the criteria.

Age, sex and diagnosis were also documented. Patients positive for CAST or criteria were followed prospectively and the incidence of alcohol withdrawal noted. In addition every episode of recognized alcohol withdrawal occurring in the hospital over the 2-year period was reported to the investigators.

Withdrawal. Clinically significant alcohol withdrawal was defined as an episode of hyperexcitability yielding a withdrawal score of ≥ 10 occurring in a patient who had one or more of the clinical criteria [7].

Complicated alcohol withdrawal was defined as an episode of withdrawal complicated by seizures, hallucination, delirium or a combination of these.

Conduct of the survey. The research nurse (JK) visited each patient chosen by the random number table as soon as possible after admission and offered the CAST. The questionnaire was completed by the patient with assistance from the nurse where necessary in interpreting the questions. If patients refused they were not approached again, but if too unwell, they were visited throughout their stay and offered the CAST if their condition improved. Contact was maintained until death or discharge.

Statistical techniques. The prevalence of the characteristics of interest was determined and compared between groups using a χ^2 analysis. The proportions in the different age/sex subgroups, however, were compared using calculation of odds ratios (ORs) and 95% confidence intervals (CI) in a logistic regression analysis. The reference for each age/sex subgroup being the prevalence in that sex as a whole.

For analysis of data, raw data which had been stored in a Clinical Reporting System (CRS) (Clinical Reporting System Pty Ltd, Castle Hill 2154) data base was analysed using Statistical Package for Interactive Data analysis (SPIDA) (Statistical Computing Laboratory Macquarie University NSW 2109) software.

Results

Sample

A total of 2046 patients were included in the sample. There were 1082 men and 964 women. This

Table 1. *Positive by CAST men/women*

	Male	Female	Total
CAST pos	154	39	193
CAST neg	556	604	1160
Total	710	643	1353
% Age pos	22	6	14.3

$$\chi^2 = 67.4; df = 1 \quad p < 0.001.$$

Table 2. *Positive clinical criteria for risk of withdrawal*

	Male	Female	Total
Criteria pos	133	28	161
Criteria neg	949	936	1885
Total	1082	964	2046
% Age pos	12.3	3	7.9

$$\chi^2 = 61.9; df = 1 \quad p < 0.001.$$

represented approximately 12% of all admissions to the general wards during the period in question. The CAST was completed by 1353 patients; 625 were too unwell and 68 refused. The daily alcohol consumption had been recorded in grammes by the admitting resident in 1410 cases (69%).

Frequency of alcohol-related problems

Overall, 14.3% of those completing it had a positive CAST score, and 7.9% of the whole patient group had at least one criterion for risk of withdrawal. Thirteen patients (0.65%), 11 men and 2 women, all with positive clinical criteria, subsequently suffered an alcohol withdrawal reaction complicated by seizure, hallucinations or delirium. There was a marked difference between men and women, with men 3-4 times more likely to have problems and/or withdrawal than women (Tables 1, 2). Thirty-eight CAST positive patients and 74 clinical criteria positive patients developed clinically significant withdrawal.

Risk ratios for age and sex

There was a significant tendency in both sexes for problems to be more common in the younger age

groups, with patients of both sexes over 60 years of age being markedly less likely to have problems or to be at risk of withdrawal. Only 1.0% of women over 60 years had a significant CAST score and 1.3% had clinical criteria for risk of withdrawal (Tables 3, 4).

Comparison of CAST and clinical criteria for risk of withdrawal

The CAST could only be used in those willing or well enough to complete it, while the criteria were applied to all patients, allowing those who were too sick or unwilling to do so to be compared to those who did complete CAST. There was a statistically significant increase in the incidence of criteria for the risk of withdrawal in those patients unable to complete the CAST compared to those who did, and those who refused had a higher incidence still (Table 5).

Male/female differences

In order to check whether the male/female differences were due to under-ascertainment of problems in women, we compared the rates at which alcohol histories were taken and the frequency with which patients at risk were monitored for withdrawal in the two sexes, and we also noted the incidences of alcohol-related diagnoses and subsequent complicated alcohol withdrawal. No differences were seen in the former two measures, and the male:female ratio of 3-4:1 was maintained in the latter two (Table 6).

Alcohol-related diagnoses

The rate of alcohol-related diagnoses as the reason for admission was 4.3% overall, 6.3% for men and 2.3% for women (Tables 6, 7).

Discussion

The major findings of this prospective survey of a random sample of general hospital admissions are that 14% of patients admit to alcohol-related problems, 8% are at significant risk of alcohol withdrawal, and there are marked differences between men and women and between older and younger patients. A secondary finding is that those patients too unwell or unwilling to complete the questionnaire had high rates of alcohol problems as indicated

Table 3. Risk ratios for CAST positivity

Age	Males			Females		
	Prevalence	OR	(95% CI)	Prevalence	OR	(95% CI)
18-29	27/58	3.2	(1.9-5.2)	13/46	8.1	(3.9-17.0)
30-39	27/52	3.7	(2.3-6.2)	7/45	3.1	(1.3-7.3)
40-49	23/59	2.3	(1.4-3.8)	6/57	2.0	(0.8-5.0)
50-59	28/90	1.8	(1.1-2.8)	5/67	1.3	(0.5-3.4)
60-69	29/189	0.6	(0.4-1.0)	4/128	0.5	(0.2-1.4)
70-79	19/182	0.3	(0.2-0.6)	3/168	0.2	(0.1-0.7)
> 80	1/81	<0.1		1/132	<0.1	

OR = odds ratio; CI = confidence interval.

Table 4. Risk ratios for risk of withdrawal by age/sex

Male				Female			
Age	Prevalence	OR	(95% CI)	Age	Prevalence	OR	(95% CI)
18-29	47/166	3.6	(2.2-6.1)	18-39	9/133	3.6	(2.6-4.9)
30-39	24/90	3.0	(1.7-5.1)				
40-49	21/133	2.9	(1.7-4.9)	40-59	10/182	2.5	(1.8-3.4)
50-59	27/279	1.4	(0.8-2.3)				
60-69	13/287	0.7	(0.45-1.1)	60-79	7/433	0.34	(0.26-0.48)
70-79	1/119	0.27	(0.0-0.4)	80-99	2/216	0.1	(0.04-0.26)

OR = odds ratio; CI = confidence interval.

by their higher risk of alcohol withdrawal. A questionnaire-based survey would appear to underestimate the incidence of alcohol-related problems in an in-patient population by about 25%.

Some limitations of this study must be acknowledged. First, use of arbitrary criteria for the risk of alcohol withdrawal is necessarily imprecise and there is no external "gold standard" available for vali-

dation. As all withdrawal reactions in the hospital were reported to us we know that no patient in our sample with negative criteria developed a recognized withdrawal, but it is of course possible that some patients with no recorded criteria of risk developed mild unrecognized alcohol withdrawal. In previous work, however, we have shown that the criteria do select a group of patients who have a high risk of complicated withdrawal if left untreated and so they have some degree of predictive validity [7].

Therefore, although the two techniques of CAST and recording clinical criteria do not measure the same things, we believe the criteria are a reasonable test of the external validity of the CAST in this study.

Secondly, these results only apply to our in-patient population. The NMMH contains the Area Alcohol and Toxicology units, so that patients admitted for detoxification and drinkers who take overdoses are over-represented (see Table 7) but otherwise the sample is typical of general hospital

Table 5. Correlation between CAST status and risk of withdrawal

	CAST Status		
	Refused	Not offered	Completed
Criteria pos	12	59	90
Criteria neg	57	566	1263
Total	69	625	1353
% Age pos	17.4	9.4	6.7

 $\chi^2 = 13.5$; $df = 2$; $p = 0.001$.

Table 6. Measures of ascertainment in men and women

	Males		Females		Ratio	Chi ² df = 1	p value
Alcohol intake rec. (g)	764/1084	(70.5%)	648/964	(67.2%)		2.5	0.1 ns
Patients at risk monitored for withdrawal	110/133	(82.7%)	22/28	(78.6%)		0.27	0.6 ns
Incidence of alcohol- related diagnoses	68/1084	(6.3%)	20/964	(2.1%)	3.0	13.5	<i>p</i> < 0.001
Subsequent complicated alcohol withdrawal	11/1084	(1.15)	2/964	(0.2%)	4.9	5.2	<i>p</i> 0.02

in-patients and our figures are very similar to those obtained by others [2,8-10].

There are some implications of these results for general hospital practice. First, a considerable number of patients would benefit from early intervention, probably about one in eight admissions. These patients comprise the group with a positive consequence score by CAST but not advanced to the stage of being at risk of alcohol withdrawal. Published data by Saunders and others has documented the value of early intervention in such people [11]. Secondly, one in 12 patients are at risk of alcohol withdrawal during their stay in hospital and about one in 25 admissions is for an alcohol-related problem. Overall, about 20% of all admissions to our hospital, allowing for the underestimate inherent in the limited response to CAST, have some alcohol-related problem which is only occasionally the primary reason for admission.

Finally, the distribution of alcohol problems in our in-patient group was not even. Others have demonstrated in in-patient populations that men will have more alcohol problems than women [2,5],

that urgent admissions are more likely to have problems than routine admissions [1,5], that patients admitted with trauma usually have high rates [12] and that patients with alcohol problems tend to be younger [9]. We have shown in this study that the male:female ratio is about 3:1, that problems are most common in the younger age groups and that the difference between men and women is not explained by under-ascertainment in women.

We believe that these findings are important for planning routine screening and early intervention studies in hospital. Tolley & Rowland have shown that there are opportunity costs for such activities [13] and it is clearly important to ensure they are targeted as well as possible.

We have found that the group likely to provide the highest yield for screening would be men under the age of 40 years and women over the age of 60 years would provide very little return for the considerable effort involved. It would seem reasonable, therefore, depending on the resources available, not to attempt to screen every in-patient but to find an optimal target group which should certainly include the first group but probably not the second.

Furthermore, we and others have shown in previous reports that in the over-60 age group, the use of benzodiazepines may be a more profitable focus of attention than alcohol since up to 50% of older in-patients may be taking them and there is a strong association with cognitive impairment and confusion [14-16].

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Table 7. Alcohol-related diagnoses as the reasons for admission

	Men	Women	Total
Alcohol withdrawal	12	6	18
Drug overdose	16	4	20
Alcoholic liver disease	7	5	12
Pancreatitis	5	0	5
Other GI	10	2	12
Neurological	7	2	9
Trauma	5	0	5
Miscellaneous	6	1	7
Total	68	20	88

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