

DRINKING PATTERNS AMONG MEDICAL IN-PATIENTS WITH REFERENCE TO MAST CATEGORIES: A COMPARATIVE STUDY

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Abstract — The aim of the study was to describe the drinking patterns and alcohol consumption of patients screened by the Michigan Alcoholism Screening Test (MAST) in a sample of medical patients from a general hospital of a French-speaking, wine-drinking country. Data were recorded using a structured interview administered to 103 consecutively admitted 20–75-year-old MAST-positive patients and 103 age-matched and sex-matched MAST-negative controls admitted to the same ward. Relevant differences between MAST-positive and MAST-negative patients included the frequent report of recent and total abstinence in MAST-positive patients (23% versus 4% in controls), their tendency to drink alone, and less often during mealtimes, at home, or with family or friends than MAST-negative patients. Alcohol consumption was significantly higher in MAST-positive patients of both sexes with 250 and 270 g per week being the optimal discriminative cut-off level of consumption for men and women, respectively (kappa coefficient, 0.70 and 0.81, respectively). Regular drinking was the predominant drinking status of both MAST-positive and MAST-negative patients. This study suggests that a screening test such as the MAST, developed in an English-speaking country may be useful in a French-speaking, wine-drinking country. The test identified patients with drinking patterns that are culturally abnormal, yet in certain respects similar to those of alcoholic patients from other drinking cultures. These findings therefore emphasize the worldwide relevance of the concept of the alcohol dependence syndrome in addition to the transcultural usefulness of alcoholism screening tests.

INTRODUCTION

The normal consumption of alcohol is usually defined by societal and cultural norms. In the French-speaking part of Switzerland, as in its neighbouring countries, France and Italy, alcohol drinking, in particular wine drinking, is an 'obligate' behaviour for many socially active people. This social role of alcohol is associated with a very high frequency and average amount of alcohol intake, as reflected by the fact that these aforementioned countries belong to the ten 'world leaders' in alcohol consumption (Schmid and Blanchard, 1986). Similarly, 'abnormal drinking' is also culturally defined according to social norms and patterns of

alcohol use. Despite differences that exist in normal and abnormal patterns of drinking between different countries, there is a growing worldwide consensus about the conceptual definition of 'alcoholism'; it is considered as a state of dependence on alcohol characterized by an abnormal and compulsive consumption which frequently persists despite adverse personal and social consequences, and serves the purpose of experiencing certain psychic effects or avoiding the discomfort of their absence (Royal College of Psychiatrists, 1986; American Psychiatric Association, 1987; Barrucand, 1988).

We recently showed that alcoholism screening questionnaires like the Michigan Alcoholism Screening Test (MAST) (Selzer, 1971), developed in English-speaking countries, are

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usable and accurate when transposed to the cultural situation of French-speaking medical patients in Switzerland (Yersin *et al.*, 1989). This observation indicates not only the trans-cultural similarities shared by alcoholic patients, but also the relevance of the concept of alcohol dependence worldwide. We therefore chose to investigate the drinking patterns of alcoholic medical patients screened by a test such as the MAST in a wine-drinking country, and to describe them according to the cultural norms of drinking. This is of even greater interest when we consider the high prevalence of alcohol problems in medical patients (Taylor *et al.*, 1986; McIntosh, 1982; Trisconi *et al.*, 1989).

As part of a case-control study designed to assess the comparative use of hospital resources of alcoholic and non-alcoholic medical patients identified by a positive and a negative MAST, respectively (Niquille *et al.*, 1991), we investigated the drinking patterns of these two age and sex-matched cohorts; the descriptive and comparative data of this study are reported here with the aim of analysing them according to the known drinking patterns of the Swiss population. The use of a general hospital population of patients to describe an alcoholic pattern of drinking limits the generalizability of the results (the Bergson bias), yet may offer insights into the drinking patterns of alcoholic patients screened systematically when compared with age-matched and sex-matched controls.

PATIENTS AND METHODS

Between September 1st, 1988 and March 18th, 1989, all patients aged 20–75 years admitted to the general medical ward of the University Hospital in Lausanne, Switzerland, were eligible for inclusion in a systematic study of the use of hospital resources with reference to alcoholism (Niquille *et al.*, 1991). Excluded from this population ($n = 702$) were patients unable to understand French ($n = 29$), those suffering conditions severe enough to render them incapable of answering questions ($n = 37$, including six with a terminal alcohol-related disease) and those who refused to participate ($n = 8$). Patients discharged prior

to the interview were also excluded from the study population ($n = 4$).

A French translation of the MAST (Yersin, 1991)(see Appendix) was administered by one of us (M.N.) to each eligible patient within the first 3 days after admission. A total of 624 patients completed the test (89% of the eligible population), including 375 men (60%) and 249 women (40%). According to a previous validation study, patients were said to be MAST-positive ('alcoholic') if their score was ≥ 8 , and MAST-negative if their score was ≤ 4 ; these cut-off values have been shown to have a positive and negative predictive value > 90 , respectively (Yersin *et al.*, 1989). A total of 103 patients (77 men and 26 women or 17% of the study population) were MAST-positive and were matched for sex, age (plus or minus 5 years) and admission period with 103 MAST-negative patients. Thirty-five patients (29 men and six women, or 6% of the study population) had MAST scores from five to seven. The average age of MAST-positive and MAST-negative patients was 53 years (median, 52) and 54 years (median, 54), respectively.

In addition to the MAST, a structured interview addressing patterns of alcohol drinking was also performed. Drinking status was defined according to the frequency of alcohol consumption during a typical week; the period of reference was the patient's life span. A *usual abstainer* referred to a patient who consumed on average less than one glass of any alcoholic beverage per week. Patients who consumed more than this were classified as *drinkers* and, by definition, all MAST-positive patients were considered drinkers. Drinkers were further divided into two groups: *current drinkers* and *recent abstainers*. The latter was defined as a reported total abstinence during the 4 weeks prior to hospital admission.

Using a structured questionnaire, all drinkers were interviewed regarding their alcohol consumption habits: amount and type of alcohol consumed in a typical week during the previous 6 months, and predominant time, location and circumstances (alone or with others) when drinking. A quantitative estimate of reported consumption was made by converting the number of standard glasses per type of alcohol consumed in a typical week to grams of

pure alcohol per week. Concentration values of alcohol used in this study were 88 g/l for wine, 40 g/l for beer, 160 g/l for cocktails and 320 g/l for distilled spirits.

Analysis of data was primarily focused on the comparative assessment of patterns and amount of alcohol consumed of MAST-positive and MAST-negative patients. In order to determine the cut-off value of the amount of alcohol consumption that optimally discriminated MAST-positive from MAST-negative patients, the kappa coefficient of agreement beyond chance was measured for different amounts of consumption in relation to MAST categories. A Pearson's correlation analysis was performed to assess the relation between the MAST score and the amount of alcohol consumed per week. In order to keep with a comparison adjusted for age, sex and period of admission, analysis excluded those pairs of patients having a usual abstainer ($n = 45$ pairs) as well as pairs including patients for whom data were incomplete ($n = 6$ pairs). The analysis was therefore focused on 52 pairs of patients (41 pairs of men and 11 pairs of women). Statistical comparisons of categories or distributions of continuous variables were made using the Chi-square test and the Student's *t*-test, where appropriate.

RESULTS

Drinking status according to MAST category

and sex is illustrated in Table 1. Usual abstinence was reported frequently (44%) by MAST-negative patients. Among drinkers, however, recent abstinence was more often reported by MAST-positive patients (23%) than by MAST-negative patients (4%) (Chi-square = 14.92; $P < 0.001$). Current drinking was the most predominantly reported drinking status in both groups with no substantial difference between the sexes.

The type of alcoholic beverage consumed according to MAST category and sex is reported in Table 2. Preferences were remarkably similar regardless of MAST category, with wine being the most frequently reported alcoholic beverage. Although the preference for wine was also similar for both sexes, cocktails were consumed more frequently by women than by men (45% versus 9%, respectively; Chi-square = 14.69; $P < 0.001$) whereas beer was consumed more frequently by men than by women (45% versus 9%, respectively; Chi-square = 8.13; $P < 0.005$).

The predominant time and place of drinking as well as company while drinking is reported in Table 3. Although mealtime was the most frequently reported time of drinking in both groups, this pattern was more pronounced among MAST-negative patients; MAST-positive patients were more distributed throughout the other possible time periods of drinking. The same trend was also evident for

Table 1. Drinking status according to MAST category and sex

	Current drinkers* <i>n</i> (%)	Recent abstainers† <i>n</i> (%)	Usual abstainers‡ <i>n</i> (%)	All <i>n</i> (%)
MAST-positive	79 (77)	24 (23)	—	103 (100)
males	60 (78)	17 (22)	—	77 (100)
females	19 (73)	7 (27)	—	26 (100)
MAST-negative	54 (52)	4 (4)	45 (44)	103 (100)
males	43 (56)	3 (4)	31 (40)	77 (100)
females	11 (42)	1 (4)	14 (54)	26 (100)

*Current drinkers refers to patients reporting a current alcohol consumption of at least one drink per week.

†Recent abstainers refers to patients reporting total abstinence during the previous 4 weeks.

‡Usual abstainers refers to patients reporting a life-long abstinence, i.e. an alcohol consumption of less than one drink per week.

Table 2. Type of alcoholic beverage* according to MAST category and sex (drinkers only)†

	Wine <i>n</i> (%)	Beer <i>n</i> (%)	Cocktails <i>n</i> (%)	Distilled alcohol <i>n</i> (%)
MAST-positive (<i>n</i> = 52)	44 (85)	20 (38)	7 (13)	12 (23)
MAST-negative (<i>n</i> = 52)	48 (97)	19 (37)	10 (19)	8 (15)
Male patients (<i>n</i> = 82)	72 (87)	37 (45)	7 (9)	17 (21)
Female patients (<i>n</i> = 22)	20 (91)	2 (9)	10 (45)	3 (14)

*Several answers were possible.

†The population (52 pairs) was comprised of 41 pairs of matched male patients (MAST-positive and MAST-negative) and 11 pairs of matched female patients (MAST-positive and MAST-negative) who reported current drinking.

place of drinking; although the home was the most prevalent location for both groups, it was more prevalent among MAST-negative than among MAST-positive patients. Bars and restaurants were a frequent drinking location of the latter group. It should be pointed out, however, that this was not true for MAST-positive females, of whom the majority (9 out of 11) drank at home. Drinking alone was also quite distinctive of MAST-positive patients; it was the most frequent pattern of drinking among this group (52%), whereas it was the least frequent among MAST-negative patients (19%). This difference was even more pronounced among MAST-positive women, since 8 out of 11 of them drank predominantly alone.

An analysis of the estimated amount of pure alcohol consumed per week showed striking differences between MAST-positive and MAST-negative patients of both sexes. Distribution of the values is shown in Fig. 1(a and b). Although there was some overlap between the two groups at lower values, consumption exceeding 300 g/week was rare among MAST-negative patients of both sexes. The average weekly alcohol consumption of MAST-positive and MAST-negative males was 673 g/week versus 168 g/week, respectively ($P < 0.001$). The corresponding values for females were 870 g/week and 104 g/week, respectively ($P < 0.001$). It should be noted, however, that the mean alcohol consumption of MAST-positive women was skewed due to two heavily drinking patients (> 1500 g per week). The optimal

cut-off value for the amount of consumption that best discriminated MAST-positive from MAST-negative patients was determined using the kappa coefficient of agreement for different values of consumption (Fig. 2). The

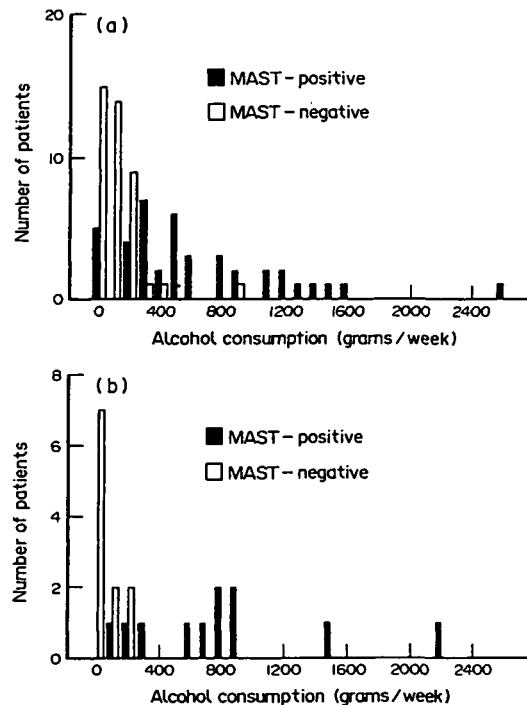


Fig. 1. Distribution of alcohol consumption according to MAST category. (a) Men (41 pairs of age-matched patients); (b) women (11 pairs of age-matched patients).

Table 3. Predominant time and place of alcohol consumption, and company while drinking, according to MAST category (drinkers only)*

	Mealtime <i>n</i> (%)	Morning <i>n</i> (%)	Afternoon <i>n</i> (%)	Evening <i>n</i> (%)	Other† <i>n</i> (%)	<i>P</i> ‡
MAST-positive (<i>n</i> = 52)	20 (38)	7 (13)	6 (12)	10 (19)	9 (17)	< 0.005
MAST-negative (<i>n</i> = 52)	41 (79)	2 (4)	3 (6)	3 (6)	3 (6)	
	Home <i>n</i> (%)	Bars/restaurants <i>n</i> (%)	Workplace <i>n</i> (%)			
MAST-positive (<i>n</i> = 52)	29 (56)	17 (33)	6 (12)	< 0.025		
MAST-negative (<i>n</i> = 52)	43 (83)	7 (13)	2 (4)			
	Alone <i>n</i> (%)	With friends <i>n</i> (%)	With family members <i>n</i> (%)			
MAST-positive (<i>n</i> = 52)	27 (52)	22 (42)	3 (6)	< 0.001		
MAST-negative (<i>n</i> = 52)	10 (19)	24 (46)	18 (35)			

*The population (52 pairs) was comprised of 41 pairs of matched male patients (MAST-positive and MAST-negative) and 11 pairs of matched female patients (MAST-positive and MAST-negative) who reported current drinking.

†Other included patients reporting no predominant time or variable drinking patterns during a typical week.

‡Chi-square test.

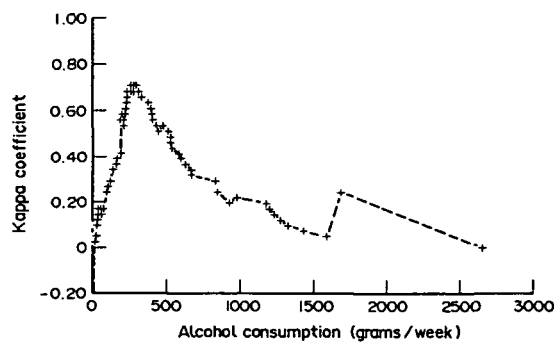


Fig. 2. Kappa coefficient of agreement between different cut-off values of alcohol consumption (g/week) and the MAST category in male patients (41 pairs). The highest kappa value (0.70) determines the cut-off value of consumption (252 g/week) that best discriminates MAST-positive from MAST-negative patients.

highest agreement (kappa values: 0.70 and 0.81, for males and females, respectively) was reached for both sexes at approximately 250–270 g per week. The use of other cut-off values for 'acceptable' alcohol consumption found in the literature provided lower kappa values when tested in this particular population (Table 4). The relationship between the

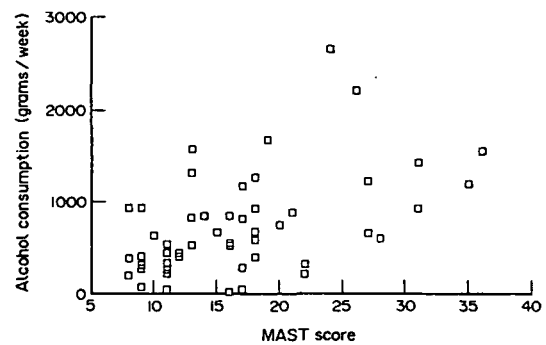


Fig. 3. Relation between amount of alcohol consumption (g/week) and the MAST score in MAST-positive patients (41 men and 11 women).

Linear correlation coefficient: $r^2 = 0.25$.

amount of alcohol consumed per week and the individual MAST score among MAST-positive males and females is shown in Fig. 3; there was a weak linear correlation ($r^2 = 0.25$).

DISCUSSION

This study provides some insights into the comparative drinking habits of alcoholic medi-

Table 4. Agreement (kappa coefficient) between a given level of an acceptable alcohol consumption (according to the medical literature) and MAST category

Source (reference)	Males		Females	
	g/week	kappa	g/week	kappa
RCP*	400	0.56	280	0.63
HEC†	168	0.39	120	0.63
General practitioners‡	161	0.39	112	0.63
Sanchez-Craig§	160	0.39	160	0.72
Present study	252	0.70	270	0.81

*The Royal College of Psychiatrists (Royal College of Psychiatrists, 1986).

†The Health Education Council (Royal College of Psychiatrists, 1986).

‡General practitioners (Wallace *et al.*, 1988).

§Sanchez-Craig and Israel (1985).

||Level of alcohol consumption that best discriminated (higher kappa value) MAST-positive from MAST-negative patients in the present study.

cal patients screened by a standardized alcoholism screening questionnaire (the MAST) and age-matched and sex-matched MAST-negative patients from a French-speaking, wine-drinking country.

Looking at the frequency of drinking, it is of particular interest to note that, unlike MAST-negative patients, MAST-positive patients frequently reported recent abstinence (23%). Such findings should be interpreted cautiously, however, as various aspects of the alcohol dependence syndrome may be represented here: repeated attempts to cut back, the well-known denial tendency of alcoholics, a progressive decline in alcohol tolerance, a drinking interruption because of illness, or illness due to abstinence (withdrawal-related morbidities). The fact that recent total abstinence was rarely reported in the MAST-negative cohort indicates the significance of such information about medical patients. It should also be noted that, in contrast to total abstinence, the MAST-negative cohort frequently reported a lifelong low level of drinking (less than one drink per week). These data are consistent with previous surveys of medical patients in Switzerland, which reported a low frequency of drinking in 40–50% of patients (Trisconi *et al.*, 1989). Population surveys in this region of Switzerland have demonstrated similar results; 40–50% of adult citizens drink less than one alcoholic beverage per week (Muster, 1991).

We therefore expected to find a predominance of current and regular drinkers in both MAST-positive and MAST-negative patients in our study. The reported frequency of drinking was thus a poor indicator of problem drinking in our population of medical in-patients, as it is in the general Swiss population in which up to 40% are daily drinkers (Muster, 1991). This contrasts with the findings of Krantzler *et al.*, who reported a good predictive value of intoxication frequency among alcoholic medical patients in the United States (Krantzler *et al.*, 1990).

Among current drinkers, the reported amount of weekly alcohol consumption was significantly higher among MAST-positive than among MAST-negative patients. Both male and female alcoholic patients reported an average weekly alcohol consumption equivalent to 700–800 g of pure ethanol compared to 100–170 g among MAST-negative patients. Furthermore, among these current drinkers, there was a good agreement (kappa coefficient of agreement: 0.70) between the MAST categories and self-reported alcohol consumption, with a cut-off level of about 300 g ethanol per week for both sexes. It is interesting to note that this cut-off level is similar to that proposed in the preventive medicine literature, except perhaps for women for whom lower levels are frequently proposed (Royal College of Psychiatrists, 1986; Wallace *et al.*, 1985). These

guidelines differ from the results of our clinical study as they represent what is usually considered as a reasonable risk for developing an alcohol-related morbidity. Interestingly, Krantzler *et al.* (1990) similarly reported that in a population of American medical patients, an average alcohol consumption exceeding 280 g/week by males and 175 g/week by females was found to significantly increase the risk of a variety of alcohol-related medical and psychosocial problems. Lastly, Sanchez-Craig and Israel (1985) showed that 160 g ethanol per week (54 g/day more than three times per week) was the consumption level that best discriminated early stage problem drinkers during periods with drinking problems from problem-free phases. It is therefore likely that a drinking level in excess of 200–300 g/week may be highly predictive of problem drinking, regardless of the drinking culture and the level of alcohol consumption of the general population.

Types of preferred alcoholic beverages did not differ significantly between MAST-positive and MAST-negative patients in our study population. As expected, wine was the most frequently reported alcoholic beverage, a finding easily explained by the amount of wine production in Switzerland. Population surveys from the same area provide similar results, with 23% of the general population in the French-speaking part of Switzerland reporting daily wine drinking (Muster, 1991). Second to wine, beer consumption was common among males while cocktails were preferred by females. What was unexpected, however, was the lack of significant differences in the drinking repertoire between alcoholics and non-alcoholics of both sexes. Although patients from both cohorts consumed the same types of alcoholic beverages, major differences were found related to the time and place of alcohol consumption as well as company while drinking. Drinking at mealtimes, with family members or friends is normative in Switzerland; this drinking pattern was therefore expectedly found among MAST-negative patients. However, the fact that MAST-positive men were found to drink less frequently at home, but more frequently alone, at the workplace or in bars should be interpreted cautiously, these

findings being partly confounded by social and professional status, well-documented in similar populations (Trisconi *et al.*, 1989).

Despite relevant differences in alcohol consumption and some drinking patterns between MAST-positive and -negative patients, we were unable to display a significant linear relationship between reported alcohol consumption and MAST score in MAST-positive patients. This discrepancy has several possible explanations. Whereas the MAST screens for lifelong occurrence of drinking problems, the reported level of consumption referred to recent drinking level, which could be a poor estimator of lifelong amount of drinking. Another possible explanation is that alcohol dependence, as suggested by a positive MAST, is usually characterized not only by larger amounts of drinking but also by abnormal drinking patterns which are unrelated to consumption level.

The study population was comprised of hospitalized medical patients, attempts to generalize the results of this study to the general population should be made with caution. Hospitalization bias may have artificially increased the likelihood of finding certain drinking patterns both in the MAST-positive and in the MAST-negative cohort. It is indeed possible that medical patients may consume less alcohol than might be expected, since a minimal level of health is probably necessary to drink alcohol. Moreover, a hospitalized study population may result in an overrepresentation of lower socioeconomic classes; this confounding effect has already been mentioned with regards to the drinking patterns of alcoholic patients. Nevertheless, health-care providers are currently being urged to screen medical patients more systematically for alcohol problems because of the high prevalence in such populations (Babor *et al.*, 1986). The use of screening tests such as the MAST in medical patients from a French-speaking, wine-drinking country thus incites characterization of screened patients as precisely as possible. The design of this study allows a description of drinking patterns among alcoholics to be made in comparison with an age- and sex-matched population of MAST-negative patients. The results emphasize some peculiar characteristics

of MAST-positive patients, of which some are well known and frequently observed in alcohol-dependent patients of other drinking cultures. This study therefore provides relevant information to enhance the available knowledge about the value of the MAST.

In conclusion, our study suggests that drinking patterns of alcoholic patients screened by the MAST in hospital wards of a wine-drinking country present some characteristics that are clearly different from non-alcoholic patients and highly suggestive of alcohol dependence. These characteristics include a high level of alcohol consumption (> 250–300 g/week), recent total abstinence (during 4 weeks prior to admission), drinking alone, as well as some peculiarities as to location of drinking. Since the population studied (alcoholics and controls) was comprised of hospitalized patients, inferences about the relevance of these findings to the general population should be made cautiously. Nevertheless, these data provide important information for the use of the MAST in medical patients in Switzerland and outlines the characteristics common to alcoholics of different drinking cultures.

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APPENDIX: THE FRENCH VERSION OF THE MAST

	Oui	Non
1. Pensez-vous que vous consommez de l'alcool en quantité normale, voire même inférieure à la normale?	0	2
2. Après une soirée bien arrosée, vous êtes-vous déjà réveillé en constatant que vous aviez oublié une partie de la soirée?	2	0
3. Vos proches vous ont-ils déjà fait des remarques au sujet de votre consommation d'alcool?	1	0
4. Pouvez-vous arrêter de boire après un ou deux verres sans difficulté?	0	2
5. Vous êtes-vous déjà senti coupable au sujet de votre consommation d'alcool?	1	0
6. Est-ce que vos amis ou vos proches parents pensent que vous êtes un buveur normal?	0	2
8. Arrivez-vous toujours à stopper votre consommation d'alcool dès que vous le voulez?	0	2
9. Avez-vous déjà assisté à une réunion des alcooliques anonymes, en raison d'un problème lié à votre consommation d'alcool?	5	0
10. Vous êtes-vous déjà battu alors que vous consommiez de l'alcool?	1	0
11. Est-ce que l'alcool a déjà créé des problèmes entre vous et votre conjoint?	2	0
12. Est-ce que vos proches ont déjà demandé de l'aide ou des conseils à autrui au sujet de votre consommation d'alcool?	2	0
13. Avez-vous déjà perdu des amis ou une relation sentimentale en raison de votre consommation d'alcool?	2	0
14. Avez-vous déjà eu des problèmes professionnels en raison de votre consommation d'alcool?	2	0
15. Avez-vous déjà perdu votre place de travail en raison de votre consommation d'alcool?	2	0
16. Avez-vous déjà négligé vos obligations, votre famille, ou votre travail pendant deux jours de suite ou plus en raison de votre consommation d'alcool?	2	0
17. Avez-vous déjà bu de l'alcool avant midi?	1	0
18. A-t-on déjà diagnostiqué chez vous une maladie du foie ou une cirrhose?	2	0
19. Avez-vous déjà souffert d'un delirium tremens, de tremblements importants, entendu des voix ou vu des choses qui ont disparu après avoir bu de l'alcool?	2	0
20. Avez-vous déjà demandé de l'aide ou des conseils à autrui au sujet de vos habitudes alcooliques?	5	0
21. Avez-vous déjà été hospitalisé en raison de votre consommation d'alcool?	5	0
22. Avez-vous déjà été hospitalisé dans un hôpital psychiatrique en raison de l'alcool ou d'un problème lié à l'alcool?	2	0
23. Avez-vous déjà consulté un psychiatre, un médecin, une assistante sociale, un pasteur ou un prêtre en raison d'un problème émotionnel lié à l'alcool?	2	0
24. Avez-vous déjà été arrêté, ne serait-ce que pour quelques heures, en raison d'un état d'ivresse?	2	0
25. Avez-vous déjà été inculpé d'ivresse au volant?	2	0

SCORE:.....