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The 2-year course following detoxification treatment of substance abuse: the possible influence of psychiatric comorbidity

Received: 15 November 1996 / Accepted: 18 June 1997

Abstract The influence of psychiatric comorbidity on the course and outcome in a nationwide representative sample ($n = 351$) of treatment-seeking substance users over a 28-month period was studied prospectively. The patients were administered the Diagnostic Interview Schedule and a questionnaire on drinking history. At 16 and 28 months after admission the patients returned a questionnaire on drinking history and mental health. In cases of those lacking information on either follow-up (45%), details on drinking status was obtained from informants. Completely abstinent were 16%. Generalized anxiety disorder and/or social phobia at the index admission predicted abstinence during the follow-up [odds ratio (OR) = 0.25], whereas onset of alcoholism among these patients after age 25 years predicted a worse prognosis (OR = 13.5). Also increasing number of social consequences related to abuse (OR = 1.3) and drinking more than the median (OR = 2.1) predicted a poor outcome. The abstinent group had significantly better mental health at follow-up. The patients with comorbid psychiatric disorders at admission were worse at follow-up. Although substance use disorders and comorbid psychiatric disorders have to a certain degree separate courses, there is nevertheless significant interaction between them. Early treatment and recognition of comorbid psychiatric disorders among substance abusers is necessary.

Key words Alcoholism · Substance abuse · Psychopathology · Comorbidity

Introduction

Among alcoholics and other substance use disorder patients additional psychiatric disorders are highly prevalent (Hendriks 1990; Regier et al. 1990; Ross et al. 1988; Tómasson and Vaglum 1995). Their clinical significance for course and treatment of substance use disorders is, however, still unclear. A recent paper (Donovan and Mattson 1994) on treatment matching research found no single treatment to be superior for all substance abusing patients, and that there appears to be an interaction between types of patients, the form of treatment and outcome. Examining the course and outcome of substance abuse patients by psychiatric diagnoses could be a possible means by which specific groups for controlled treatment trials can be identified. This notion is supported by a study of 460 male alcoholics and 282 drug addicts (McLellan et al. 1983), where the outcome of patients with “midrange psychiatric severity” varied according to treatment setting. However, this type of classification of psychiatric comorbidity does not indicate whether specific psychiatric disorders that are comorbid with substance abuse influence outcome. This question has been addressed only in a few studies. Using the Diagnostic Interview Schedule (DIS; Robins et al. 1981) Rounsaville et al. (1987) evaluated 266 alcoholics seeking three different types of inpatient treatment in the U.S. and reassessed them 1 year later. Worse drinking outcome was predicted by general psychopathology, antisocial personality and additional substance use disorders. Depression among men was associated with a worse drinking outcome, whereas among women it was associated with a better outcome. In contrast, a follow-up study of selected alcoholic patients drawn from a veterans’ administration hospital in the U.S. showed comorbid psychiatric diagnoses to be poor predictors of drinking outcome, though nevertheless being related to worse mental health on follow-up (Powell et al. 1992).

Type A and B classification of alcoholics has been shown to have prognostic validity, with type B having a worse overall prognoses (Babor et al. 1992). In accordance with

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this typology, social consequences related to alcohol predict a worse outcome (Shaw et al. 1990; Vaillant 1995). Furthermore, these patients have an early onset of alcoholism and are more often affected by polysubstance abuse, bipolar disorder, panic disorder (Roy et al. 1991), and antisocial personality disorder (Powell et al. 1992; Roy et al. 1991). These studies underline the importance of examining the effect of the interaction between psychiatric comorbidity and age at onset of alcoholism and social consequences related to alcohol (as a measure of severity of the alcoholism) on the level and course of alcohol consumption. Since most studies have been on selected clinical data, there is a need for studies on more representative samples of treatment seeking substance abusers.

In a prior publication (Tómasson and Vaglum 1996) males with an additional panic disorder had a poor outcome at the 16-month follow-up. The predictive significance of level of psychiatric distress varied in relation to level of alcohol consumption at admission. It is known that the short-term outcome of alcoholism treatment tends to show favourable results; however, as time passes the effect of treatment diminishes (Vaillant 1995). Consequently we have reexamined our patients 12 months after the first follow-up to assess the significance of the psychiatric disorders for the course and outcome of both drinking and psychiatric distress during a 28-month period utilizing information from both follow-ups. Abstinence was the goal of treatment in all cases. No patients seeking substance abuse treatment were excluded. This design takes into consideration most of the criticism of the psychiatric comorbidity research among substance abusers that has recently been outlined (Schuckit and Hesselbrock 1994). However, the primary/secondary issue is not addressed here, whereas the importance of early vs late age at onset of alcoholism is studied.

The following questions are addressed:

1. Do comorbid psychiatric diagnoses at index admission predict the level of alcohol consumption at the 28-month follow-up, and the course of drinking over the follow-up period?
2. Are there any associations between comorbid psychiatric diagnoses and age at onset, alcohol consumption or alcohol-related social consequences before admission that are related to the subsequent course of drinking?
3. Do psychiatric diagnoses at index admission predict psychiatric distress at the 28-month follow-up, and the course of psychiatric distress over the follow-up period?
4. Are there any associations between comorbidity, the course of drinking and age at onset of alcohol consumption and the subsequent course of psychiatric distress?

Methods

Evaluation at the time of admission to treatment

Evaluation at the time of admission to treatment has been described in detail in previous papers (Tómasson and Vaglum 1995; Tómasson and Vaglum 1996). Briefly, the subjects were patients who were consecutively admitted from December 1991 to Sep-

tember 1992 to the two university alcohol and other substance use disorder treatment units in Iceland, and every sixth patient admitted to a separate detoxification unit staffed by general practitioners. The sample is representative of patients seeking this type of treatment in Iceland. A total of 351 patients completed an Icelandic (Stefánsson and Línal 1990) computerized version (Harris and Harris 1987) of the Diagnostic Interview Schedule (DIS; Robins et al. 1981). The present study comprises DSM-III disorders present in the past 6 months without the use of any exclusion criteria or hierarchical system. Subjects that only abuse alcohol are referred to as alcoholics, whereas those who also abuse other substances are referred to as polysubstance users. The level of psychiatric distress at intake was measured in the same way as done in our 16-month follow-up (Tómasson and Vaglum 1996) as the total number of axis-I diagnoses.

As outlined elsewhere (Tómasson and Vaglum 1996), it was possible to obtain alcohol consumption estimates from 316 patients.

Evaluation at the first follow-up

Approximately 1 year later, after intake, a questionnaire, including the same questions as in the questionnaire completed at intake, was mailed to the 351 patients. Every effort was made to contact the patients, including using informants identified by each patient at admission. These efforts resulted in a response by 264 (75%) patients at on average 15.8 months (SD 2.3 months) after the start of the study. By using information from the contact persons as well as the treatment facilities, it was possible to classify all but 14 men and 4 women into either drinking or not drinking.

To assess the psychiatric distress on follow-up the screening instrument MHI-5 (Berwick et al. 1991) was utilized (Tómasson and Vaglum 1996). MHI-5 gives a sum score of 5–30, with a higher score indicating more psychiatric distress.

Evaluation at the second follow-up

The evaluation at the second follow-up was conducted in a similar manner as the evaluation of the initial one. It was completed on average 28 months (SD 4.8 months) after the admission into treatment. The drinking career of 291 patients was identified. Of the 38 men lost to the second follow-up, 26 had been actively using substance at our first follow-up, 5 had been sober and 7 had also been missing from the first follow-up. Of the 22 women missing, 17 had been actively using substances at the first follow-up, 3 had been sober and 2 were missing from both follow-ups. On the basis of this, those with missing information were classified as drinkers.

The patients were queried about the amount of alcohol consumed in the last follow-up month, in the same manner as had been done at admission and at the first follow-up. Furthermore, they were asked to complete the MHI-5 (Berwick et al. 1991).

Statistical analyses

For comparisons of means either a *t*-test was used or, where appropriate, ANOVA. For comparisons of proportions a chi-square was used. To correct *p*-values for multiple comparisons, a Bonferroni correction was applied (Kleinbaum et al. 1988). Linear regression models were used to predict level of alcohol consumption and psychiatric distress (MHI-5) on follow-up. Prediction of abstinence/drinking over the entire follow-up period was achieved with logistic regression models.

Results

Classification of course

The patients can be divided into three groups according to their drinking behaviour during the follow-up period.

Complete “abstainers” through the follow-up period were 16% of both genders. A second group had a “fluctuating course”, i.e. sober during either the first or second follow-up period (men: 28%, women: 25%). The remaining 56 and 59% of men and women, respectively, drank alcohol during both follow-up periods and are called “drinkers” in the analysis. Included in the last group are 7 patients who died in the first follow-up year; 6 deaths were directly related to substance use (alcohol and/or other).

Course of drinking by demographic and alcohol-related variables

For women neither the sum score of alcohol-related consequences nor individual items predict the course (Table 1). However among men, recurrent health and social problems, arrests for public intoxication and loss of employment were associated with a fluctuating or a drinking course. Broken relationships were primarily associated with a fluctuating course. Among women, alcohol consumption in the month prior to admission ranged from 29.4 g/day (SD 45.4 g/day) for fluctuators to 50.7 g/day (SD 74.5 g/day) for the abstainers (n.s.) In the case of men there was a significant gradient between alcohol consumption in the month prior to admission and course ($F = 4.58$ $df = 2$ $p = 0.0112$), from abstainers [50.7 g/day (SD 61.4 g/day)], through fluctuators [90.8 g/day (SD 101.5 g/day)] to drinkers [109.5 g/day (SD 117.5 g/day)]. Women had a later age of onset of alcoholism than men by 6.5 years (Scheffe critical difference 2.8 years, $p <$

0.0001). However, no difference was found in age or age at onset for alcoholism among the three categories, of course.

Alcohol consumption at follow-up

Of the 153 men and 60 women who gave information on level of alcohol consumption in the last follow-up month, 44 men (29%) reported to have been drinking in that month on average 80.1 g/day (SD 88.1 g/day), and 23 women (38%) reported to have been consuming in that month an average of 34.7 g/day (SD 53.4 g/day). For the men this was 26.7 g/day less than they had reported consuming during the last month before intake ($df = 42$, paired t -test = -2.0 , $p = 0.051$), whereas in the case of the women, this was exactly the same amount as in the month prior to admission into the study.

Psychiatric diagnoses and level of alcohol consumption at follow-up

The number of patients with different psychiatric disorders can be seen in Table 2. No single psychiatric DIS diagnosis listed in Table 2 was associated with more or less alcohol consumption in the last follow-up month. Conducting a stepwise linear regression analysis with the DIS diagnoses as predictors gave the same results. Controlling for marital status, alcohol consumption before admission and age did not change the results.

Table 1 A 28-month course of drinking by gender and intake variables including social consequences related to alcohol

| At admission | Abstainers % | | Fluctuating course % | | Drinkers % | |
|--|--------------|-------------|----------------------|-------------|---------------|-------------|
| | Men | Women | Men | Women | Men | Women |
| Mean age (SD) | 41.2 (17.0) | 39.8 (15.1) | 42.0 (14.3) | 42.9 (15.3) | 40.6 (13.0) | 44.0 (14.6) |
| Mean age at onset (SD) | 23.4 (10.6) | 25.6 (14.3) | 22.2 (7.9) | 30.8 (16.3) | 24.1 (11.2) | 30.6 (11.8) |
| Percentage divorced ^a | 7.4 | 25.0 | 37.1 | 26.9 | 34.8 | 31.7 |
| Mean number of weeks working in the last 6 months (SD) ^b | 18.8 (8.6) | 10.1 (10.6) | 12.7 (10.1) | 12.4 (10.7) | 13.2 (10.1) | 12.0 (10.9) |
| Last month's mean alcohol consumption in grams/day (SD) ^c | 50.7 (61.4) | 50.7 (74.5) | 90.8 (101.5) | 29.4 (45.4) | 109.5 (117.5) | 42.7 (72.1) |
| Number of social consequences related to alcohol (mean, SD) ^d | 3.2 (1.8) | 3.0 (2.1) | 4.3 (2.5) | 2.8 (2.4) | 4.3 (2.5) | 2.5 (2.1) |
| Loss of interest in family (%) | 56.1 | 62.5 | 73.5 | 65.4 | 75.4 | 61.1 |
| >1 broken relationship (%) ^e | 7.4 | 6.7 | 32.4 | 11.5 | 14.7 | 11.1 |
| Recurrent health and social problems (%) ^f | 58.5 | 78.5 | 73.9 | 65.4 | 78.8 | 60.4 |
| Arrests for drunken driving (%) | 65.8 | 20.0 | 71.0 | 34.6 | 73.9 | 31.5 |
| >1 fight while intoxicated (%) | 51.2 | 50.0 | 46.4 | 30.7 | 52.2 | 25.9 |
| >1 injury (%) | 29.3 | 28.5 | 33.3 | 38.4 | 40.5 | 25.9 |
| >1 homeless episode (%) | 4.9 | 13.3 | 18.8 | 15.4 | 19.6 | 7.4 |
| >1 public intoxication arrest (%) ^g | 37.5 | 35.7 | 55.1 | 23.1 | 61.6 | 22.2 |
| >1 loss of employment (%) ^h | 12.2 | 12.5 | 30.4 | 11.5 | 36.2 | 16.7 |

NOTE: No differences were significant for women

^aChi-square = 19.22; $df = 6$; $p = 0.0038$ (only % divorced shown)

^b $F = 5.68$; $df = 2$; $p = 0.0039$; missing information = 6

^c $F = 4.58$; $df = 2$; $p = 0.00112$; missing information = 18

^d $F = 3.91$; $df = 2$; $p = 0.02$; missing information = 5

^eChi-square = 13.4; $df = 2$; $p = 0.001$

^fChi-square = 6.77; $df = 2$; $p = 0.04$

^gChi-square = 7.33; $df = 2$; $p = 0.03$

^hChi-square = 8.60; $df = 2$; $p = 0.0136$

Table 2 A 28-month course of drinking by psychiatric diagnoses and gender

| Diagnoses 6-months | Number of patients | | Abstainers % | | Fluctuating course % | | Drinkers % | |
|--|--------------------|-------|--------------|-------|----------------------|-------|------------|-------|
| | Men | Women | Men | Women | Men | Women | Men | Women |
| No psychiatric diagnosis except alcoholism | 57 | 18 | 22.8 | 22.2 | 22.8 | 27.7 | 54.4 | 50.0 |
| Polysubstance use | 50 | 16 | 10.0 | 25.0 | 28.0 | 18.8 | 62.0 | 56.3 |
| Schizophrenia | 10 | 6 | 0 | 33.3 | 30.0 | 16.7 | 70.0 | 50.0 |
| Affective disorders | 64 | 48 | 17.2 | 14.6 | 26.6 | 27.1 | 56.3 | 58.3 |
| Major depression | 23 | 18 | 13.0 | 22.2 | 26.1 | 33.3 | 60.9 | 44.4 |
| Recurrent | 18 | 11 | 16.7 | 9.1 | 22.2 | 0 | 61.1 | 90.9 |
| Dysthymia | 34 | 22 | 20.6 | 13.6 | 26.5 | 22.7 | 52.9 | 63.6 |
| Anxiety disorders | 115 | 58 | 18.3 | 17.2 | 23.5 | 29.3 | 58.3 | 53.4 |
| Generalized anxiety | 73 | 47 | 17.8 | 19.1 | 21.9 | 29.8 | 60.3 | 51.1 |
| Simple phobia | 50 | 31 | 16.0 | 12.9 | 30.0 | 29.0 | 54.0 | 58.1 |
| Social phobia | 57 | 38 | 21.1 | 18.4 | 26.3 | 28.9 | 52.6 | 52.6 |
| Panic/agoraphobia | 65 | 37 | 13.8 | 18.9 | 26.1 | 27.0 | 60.0 | 54.1 |
| Panic disorder | 14 | 20 | 7.1 | 10.0 | 35.7 | 15.0 | 57.1 | 75.0 |
| Panic disorder with agoraphobia | 61 | 34 | 14.8 | 17.6 | 27.9 | 29.4 | 57.4 | 52.9 |
| Agoraphobia without panic | 39 | 30 | 12.8 | 16.7 | 25.6 | 26.7 | 61.5 | 56.7 |
| Psychosexual dysfunction | 32 | 39 | 3.1 | 20.5 | 34.4 | 17.9 | 62.5 | 61.5 |
| Antisocial personality disorder | 81 | 19 | 12.3 | 15.8 | 33.3 | 31.6 | 54.3 | 52.6 |
| Cognitive impairment (MMSE < 24) | 37 | 18 | 8.1 | 13.1 | 29.7 | 25.0 | 62.2 | 61.9 |

Psychiatric diagnoses and 2-year course of drinking

The course over the 28-month period by psychiatric diagnoses is shown in Table 2. More men without than with a comorbid disorder seemed to have remained abstinent throughout the follow-up period, but the difference is not significant. Despite the full availability of data, no single diagnosis or diagnostic group had a differential relationship to the course. This included male panic disorder patients, who were expected to have a worse outcome (Tómasson and Vaglum 1996), and also antisocial personality disorder patients.

Considering the potential effect on outcome of the interaction between age at onset of alcoholism, alcohol consumption in the month prior to admission and alcohol-related consequences before admission with the psychiatric diagnoses, a stepwise logistic regression was conducted, entering all variables and all interactions shown in Table 3 so as to identify predictors of course. Given the similarities between drinkers and those with a fluctuating course, both of these were grouped together in the subsequent analyses. In general, an increasing number of alcohol-related consequences (0–9; cf. Table 1) [OR = 1.3; 95% confidence interval (CI) = 1.1–1.3], and drinking more than the median of the respective gender (OR = 2.1; 95% CI = 1.1–4.0) predicted a poor outcome. Generalized anxiety disorder and/or social phobia had a more favourable course (OR = 0.25; 95% CI = 0.12–0.53), but the onset of their alcoholism after 25 years of age made the prognosis relatively worse (OR = 13.5; 95% CI = 3.5–52.1). In this context it is important to note that the correlation between age at onset and number of social consequences is rela-

tively strong ($r = -0.577$) suggesting that those with earlier age at onset have more lifetime social consequences related to abuse.

In order to assess the effect of adjusting for gender, age at admission, age at onset of alcoholism, alcohol consumption at admission, number of alcohol-related consequences and polysubstance use, three sets of logistic regression analyses were conducted. Once again the course was classified into abstainers and non-abstainers.

Firstly the impact of diagnoses and their interaction with the number of alcohol-related consequences was examined in six separate logistic regressions. The presence of affective disorder and generalized anxiety disorder/social phobia reduced the negative prognostic effect of alcohol-related consequences (Table 3). Secondly, similar logistic analyses were conducted testing the impact of alcohol consumption in the month prior to admission and no significant interactions were found. Finally, interaction between age at onset and diagnoses were examined. The diagnoses of affective disorder (OR = 0.40; 95% CI = 0.17–0.93) or generalized anxiety/social phobia (OR = 0.18; 95% CI = 0.07–0.5) were associated with a better outcome. However, if these diagnoses were associated with age at onset of alcoholism after 25 years, the prognosis was significantly worse among those who had affective (OR = 14.7; 95% CI = 1.6–134.9) or anxiety disorders (OR = 18.9; 95% CI = 3.6–98.1). In general, late age at onset was related to a more negative outcome when controlled for social consequences related to alcohol and level of alcohol consumption prior to admission (Table 3). In none of the three sets of logistic regression analyses were polysubstance use, antisocial personality disorder or

Table 3 Predictors of outcome. Interactions between comorbid diagnoses and age at onset before or after 25 years, consumption of more than the median amount of alcohol and number of social con-sequences related to alcohol at admission (*OR* odds ratio, *CI* confidence interval)

| Diagnoses interactions | Affective disorder | Panic/agoraphobia | Generalised anxiety disorder/social phobia | Alcoholism without comorbid diagnosis | Polysubstance use | Antisocial personality disorder |
|--|------------------------------|------------------------------|--|---------------------------------------|------------------------------|---------------------------------|
| Set one with number of social consequences | OR (95% CI) 0.7 (0.5–0.9) | OR (95% CI) 0.9 (0.6–1.2) | OR (95% CI) 0.7 (0.5–1.0) | OR (95% CI) 1.2 (0.8–1.7) | OR (95% CI) 1.0 (0.7–1.4) | OR (95% CI) 1.0 (0.6–1.4) |
| Set two with alcohol consumption | 0.3 (0.1–1.1) | 0.4 (0.1–1.6) | 0.5 (0.1–4.5) | 1.9 (0.4–8.6) | 0.5 (0.1–1.7) | 1.0 (0.2–4.1) |
| Set three with age at onset | 14.7 (1.6–134.9) | 6.0 (0.6–58.1) | 18.9 (3.6–98.1) | 0.3 (0.1–1.4) | * | * |

NOTE: In all three sets of analyses age, gender, respective diagnosis, age at onset before or after 25 years, social consequences related to alcohol at admission, and consuming more than the median of alcohol for the respective gender in the month prior to ad-

mission were controlled for. The analysis also controlled for polysubstance use when examining other diagnosis than alcoholism without comorbid diagnosis

* Too few cases for analysis

gender significant predictors of course. Since early onset of alcoholism and social consequences related to alcoholism may have fully controlled for antisocial personality disorder, the data were also analysed by excluding one or both of these variables. Antisocial personality disorder still did not emerge as a significant predictor of course.

Psychiatric comorbidity and psychiatric distress on follow-up

The mean MHI-5 score on follow-up of each of the diagnostic groups from the index admission (Table 2) was compared with the score of the patients who did not have the respective diagnosis. Only one significant difference was found, i.e. women ($n = 12$) with antisocial personality disorder had a higher mean MHI-5 score at follow-up (19.9, SD 4.6) compared with the other women ($n = 49$; 14.4, SD 5.1; unpaired t -test = -3,399 $df = 59$ $p = 0.0168$). When men having no comorbid diagnosis ($n = 43$) were compared with those having comorbid diagnoses, a trend towards a lower mean MHI-5 score was found in the case of the former (13.1, SD 5.6 vs 15.6, SD 6.0). In contrast to the analysis done on the first 16-month follow-up (Tómasson and Vaglum 1996), the number of psychiatric diagnoses at admission was not associated with an MHI-5 score on the 28-month follow-up (men $r = 0.106$, $df = 162$, $p = 0.18$; women $r = 0.135$, $df = 60$ $p = 0.3$).

Using a stepwise linear regression model, only antisocial personality disorder was identified as a significant predictor of psychiatric distress when (β -coeff. = 2.5, SE 1.0, $t = 2.44$, $p = 0.0152$) controlling for age, gender and marital status. Of these control variables, only being married was associated with better mental health (β -coeff. = -2.46, SE = 0.89, $t = -2.779$, $p = 0.0059$). Conducting the analysis separately for alcoholics on the one hand, and polysubstance abusers on the other, gave the same results for the latter, whereas for the former no diagnoses predicted an MHI-5 score on follow-up.

By controlling for course of drinking three significant predictors were found, i.e. female gender (β -coeff. = 1.9, SE 0.84, $t = 2.2$, $p = 0.027$), number of prior alcohol related problems (β -coeff. = 0.64, SE 0.16, $t = 4.02$, $p < 0.001$) and polysubstance abuse with late age at onset of alcoholism (β -coeff. = -6.5, SE 3.2, $t = -2.19$, $p = 0.03$). However, the last finding is only based on three polysubstance abusers who had a very favourable outcome in terms of MHI-5 score.

Psychiatric comorbidity and course of psychiatric distress

The failure of psychiatric comorbidity at index to predict psychiatric distress on the 28-month follow-up may be related to the effect of drinking on psychiatric distress; however, the MHI-5 score and alcohol consumption in the last follow-up month were correlated for both men ($r = 0.446$, $df = 152$, $p < 0.0001$) and women ($r = 0.383$, $df = 59$, $p < 0.0023$). In order to adjust for this effect, the course of psychiatric distress was analysed by the presence or absence of psychiatric comorbidity at index and the course of drinking (Table 4).

Regardless of comorbidity at the index admission, sobriety was associated with less psychiatric distress ($p < 0.001$). Secondly, for both abstainers and drinkers, the presence of comorbidity at index resulted in a higher MHI-5 score ($p < 0.005$).

The complex interaction which had been observed in the first follow-up (Tómasson and Vaglum 1996) between psychiatric distress and alcohol consumption on admission was not replicated at the 28-month follow-up.

Finally, in a regression analysis, it was examined whether age at onset was a significant predictor of MHI-5 score on follow-up, controlling for course of drinking (entered as two dummy variables), gender and for the presence or absence of polysubstance abuse. Early age at onset of alcoholism was a significant predictor (β -coeff. = -0.08, SE 0.034, $t = -2.36$, $p = 0.02$) of a high MHI-5

Table 4 The course of psychiatric distress [mean MHI-5 score (SD)] by presence or absence of psychiatric comorbidity at admission and course of drinking over 28 months (a total of 195 patients of the 251 responding at the 16-month follow-up)

| | MHI-5 score at: | <i>n</i> | Abstainers | <i>n</i> | Fluctuating course | <i>n</i> | Drinkers |
|---|-----------------|----------|------------|----------|--------------------|----------|------------|
| Alcoholism without other comorbid psychiatric diagnosis | 16 months | 14 | 7.9 (2.7) | 10 | 13.9 (4.1) | 21 | 13.2 (4.2) |
| | 28 months | | 9.1 (3.0) | | 14.4 (3.0) | | 14.5 (5.6) |
| Alcoholism with other comorbid psychiatric diagnosis | 16 months | 36 | 12.1 (4.6) | 38 | 14.5 (5.8) | 76 | 17.8 (5.0) |
| | 28 months | | 12.6 (5.3) | | 13.9 (4.8) | | 17.3 (5.4) |

NOTE: ANOVA repeated measure was used. Drinking course: $F = 15.4$, $p < 0.001$ (non-comorbid) and $F = 19.5$, $p < 0.0001$ (comorbid); Comorbidity at admission: $F = 8.85$, $p = 0.0046$ (abstainers), and $F = 13.1$, $p = 0.0005$ (drinkers)

score. However, if we also controlled for presence or absence of other psychiatric comorbidity at admission, then age at onset of alcoholism was no longer significant.

Discussion

The 2-year abstinence rate of 16% is in the same range as expected (Länge et al. 1993; Powell et al. 1992; Shaw et al. 1990; Vaillant et al. 1983). Those classified as drinkers or as having a fluctuating course were similar on alcohol-related measures and consequences with only one exception, and significantly distinct from the abstainers. The fluctuating group should thus possibly be classified as drinkers characterized by longer durations between drinking bouts.

As expected, social consequences related to alcohol predicted a worse outcome, and heavy (above median) alcohol consumption at admission predicted a worse outcome among men. Among women, none of the demographic or alcohol-related variables predicted the course.

Psychiatric diagnoses and level of alcohol consumption on follow-up

In contrast to the findings at 16-month follow-up (Tómasson and Vaglum 1996), no psychiatric diagnosis at index was associated with more or less alcohol consumption in the last month before the 28-month follow-up. However, a low response rate (62%) may have minimized the differences, as those not responding were more likely to be drinking.

Psychiatric diagnoses and 2-year course of drinking

Comorbid anxiety disorders among alcoholics are considered to make the treatment more difficult (Frances and Borg 1993). Finding that generalized anxiety disorder and/or social phobia controlled for alcohol consumption and social consequences related to alcohol prior to admission was associated with 2 years of abstinence was unexpected. Furthermore, our anxiety disorder patients did not drink more at admission than other diagnostic groups (Tómasson and Vaglum 1996). If patients in the above study on comorbid anxiety disorders (Frances and Borg 1993)

drank more than our anxious patients, that would explain the different results. However, for patients with these anxiety disorders late age at onset of alcoholism made the prognosis worse than if the onset of alcoholism had been earlier; although a weak finding as seen by wide confidence intervals, it should nevertheless be considered in further studies on treatment. In this context it cannot be ruled out that taking count of the chronological onset of substance abuse and other psychiatric disorder could have given further information. In the large U.S. National Comorbidity study it was found that most anxiety disorders among patients with substance use disorders are primary (Kessler et al. 1996), whereas others have questioned the validity of distinguishing between substance-induced and independent anxiety and depressive disorders (Kadden et al. 1995). Thus, until a large longitudinal cohort study that follows individuals through the age period for risk at onset has been completed, the importance of what came first will be speculative. The finding that late age of onset of alcoholism among the patients with anxiety disorders was associated with a relatively less favourable outcome could possibly be due to methodological problems in the assessment of substance use disorder and other psychiatric history. But the finding should be considered in light of the fact that it is controlled for alcohol consumption in the month prior to admission and lifetime number of social consequences related to abuse which are strongly correlated with early age at onset.

Affective disorders controlled for gender predicted a better outcome; however, if age at onset of alcoholism was after 25 years of age, the prognosis was worse. Also Rounsaville et al. (1987) found that major depression among women predicted a favourable outcome, whereas in the case of men, it predicted an unfavourable outcome. Differences in age at onset of alcoholism could possibly explain this discrepancy. Affective and generalized anxiety disorder and/or social phobia reduced the negative prognostic effect of prior social consequences. There may be several reasons for this positive influence, e.g. these disorders may promote treatment seeking. Secondly, these abusers may have less severe personality disorders. This was not the case concerning antisocial personality disorder, but other personality disorders may be of significance. However, this is unlikely since among anxiety disorder patients comorbid personality disorders seem to be most prevalent among those with generalized anxiety dis-

order or social phobia (Reich et al. 1994). A third possibility is that alcoholics having comorbid affective or anxiety disorders and a late age at onset of their alcoholism may more often have a secondary alcoholism following another primary psychiatric disorder. If correct, this implies that although the clinician may not be able to make the primary/secondary distinction (Schuckit and Hesselbrock 1994), it is important to identify comorbid psychopathology early in the treatment of the alcoholic and take the age at onset of the alcoholism into account.

In accordance with another study, neither antisocial personality disorder nor polysubstance use patients had a significantly worse course (Powell et al. 1992), although other studies have found antisocial personality disorder (Rounsaville et al. 1987; Vaillant 1995) and polysubstance use to be predictors of a negative outcome (Rounsaville et al. 1987). This may be due to the fact that our sample was a representative sample of all patients seeking inpatient treatment, whereas the other studies were more selective. However, social consequences prior to intake related to alcohol use were predictive of outcome, but as seen in Table 1 several of these consequences have antisocial features. Thus, it is possible that level of psychopathy, instead of presence or absence of antisocial personality disorder, is more important in predicting outcome. This needs to be explored.

Implications

The three main implications of these findings are as follows: Firstly, it is important to assign psychiatric diagnoses in substance abusers seeking treatment 4–7 days after admission for detoxification, as diagnoses made at this time have a predictive value. Assessment after more extended sobriety may have more value for the individual patient, but this may be at the cost that patients discharged early are not psychiatrically assessed. This may result in failure of identifying patients with important comorbid disorders and providing them with appropriate care. Secondly, as regards treatment studies, the results indicate the need to account for age at onset of alcoholism, social consequences of alcohol abuse prior to entering treatment and comorbid affective and anxiety disorders when studying treatment outcome. Finally, anxiety and affective disorder patients with late onset of their alcoholism appear to need special treatment planning for their comorbid conditions.

Psychiatric comorbidity and course of psychiatric distress

In contrast to studies that have examined psychiatric severity at admission, at 6 months (McLellan et al. 1983), 12 months (Powell et al. 1992; Rounsaville et al. 1987), and in our own case, 16 months of follow-up (Tómasson and Vaglum 1996), we failed to find an association between the number of psychiatric diagnoses at admission and an MHI-5 score after 28 months. However, stratifica-

tion of the analysis by drinking course and presence or absence of a comorbid disorder at admission gave an explanation for this. Those who were sober at follow-up had significantly better mental health on both follow-ups compared with those drinking. Secondly, both drinkers and abstainers with comorbid disorders had more psychiatric distress compared with those without. This shows that not all of the psychiatric distress is secondary to substance abuse. Comorbid psychiatric disorders (Powell et al. 1992) and the course of drinking therefore need to be taken into account in order to understand the course of psychiatric distress. In addition, age at onset was as relevant for this as it had been for multiple comorbidity at admission (Buydens-Branchey et al. 1989). Accordingly, more attention needs to be focused on the early-onset alcoholics to diminish their psychiatric distress, during and after treatment, even though comorbid psychiatric disorders in certain cases are associated with a better drinking outcome. However, we cannot exclude the possibility that comorbid disorders will result in a relapse in the abstainer group at a later date.

Strengths and limitations

The primary strength is that a representative sample of patients seeking substance use disorder treatment in Iceland has been studied prospectively with two follow-ups over a 28-month period after their admission. The patients were all evaluated with a structured psychiatric interview, and a questionnaire pertaining to the alcohol use history. By using all information available, there were only 9 persons whose course could not be classified.

The main limitation of the study was the loss to follow-up of more detailed information about alcohol consumption and psychiatric distress estimates. Obtaining more information, by direct interviews with the patients as well as gathering more detailed collateral information rather than relying primarily on the questionnaire sent by mail to assess treatment failure or success, might have been preferable. But it is unlikely that the patients wrongly claim that they have returned to drinking or to the use of other substances. Thus, the results are in fact likely to be less favourable than presented here. But the results found here are similar or less favourable than other authors have found in other outcome studies as mentioned previously. It is thus possible that alcoholics are more willing to acknowledge relapse in a mail survey than a face-to-face interview. It would have been better if psychiatric distress assessment on follow-up had been done by using the DIS interview (Robins et al. 1981). Furthermore, the sample size of subgroups is sometimes small, as only 16% became abstainers. The precision of some estimations is thus low as seen by wide confidence intervals. Consequently, the analyses had to be limited to specific questions instead of examining all factors simultaneously. Thus, the careful reader might want to view the findings as indicating the possible role of psychiatric comorbidity in the prognosis of substance abuse that needs replication in other studies.

Conclusion

Psychiatric comorbidity influences the 2-year course after detoxification treatment among substance abusers. Patients with anxiety and affective disorders had, when controlled for alcohol-related social problems and age at onset, a more favourable prognosis. However, if the onset of alcoholism was late, the prognosis in these subgroups became less favourable. The use of alcohol during the follow-up by both those with and without comorbid disorders was related to more psychiatric distress. For those with comorbid disorders, the distress from the substance use came in addition to the distress resulting from the psychiatric disorder. While antisocial personality disorder as such did not predict either course or outcome, prior social consequences related to alcohol did. Thus, active substance use disorders and comorbid psychiatric disorders have partly separate courses, but there is nevertheless significant interaction between them. Proper psychiatric assessment is needed early in the evaluation of treatment-seeking alcohol and other substance abusers, with subsequent treatment plans addressing simultaneously all diagnosable conditions. As regards further research on patients with substance use disorders, note must be taken of other psychiatric diagnoses, age at onset of alcoholism, the number of alcohol-related social problems and the amount of alcohol consumption.

Acknowledgements T. Tyrfinngsson, SÁÁ, Reykjavík, and J. Bergsveinsson, National University Hospital, Reykjavík, gave access to patients in their units. Supported by the Icelandic Science Fund, the Research Fund of the National University Hospital, Reykjavík and by "Nordisk Forskerutdanningsakademi".

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