

MORTALITY OF TREATED ALCOHOLICS AFTER EIGHT YEARS IN RELATION TO SHORT-TERM OUTCOME

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Abstract — This study concerns the relation between mortality and the short-term outcome of inpatient treatment for alcoholism. A total of 121 patients (87 men, 34 women) were included, of whom 89 were voluntary and 32 compulsorily committed. They had a mean age of 41 ± 7 (SD) years and attended a 5-week programme at Runnagården, Örebro, Sweden. Most patients were socially unstable and severely alcohol-dependent. Ten months (mean) after discharge, 96% of the patients and their referring social workers were contacted with mail questionnaires. Of these patients, 13% had been totally abstinent and a further 42% improved but had had relapses. After a mean of 8.5 ± 0.27 years, 27 patients (24%) had died. All abstainers survived, but non-abstainers had nine-fold higher mortality than expected. Non-abstinent improved women tended to survive longer than non-improved women, but among non-abstinent improved men no such tendency was found. In conclusion, a reduction in the frequency and quantity of abusive drinking was not enough to reduce the higher risk of death. Only abstinence seemed to be preventive.

INTRODUCTION

In outcome studies of alcohol dependence based on questionnaires, three categories of drinking outcome have traditionally been used: total abstinence, non-abstinence improvement and no improvement in drinking. The rate of non-abstinence improvement varies from low values to 2–3 times the rate of abstinence (Emrick, 1974). The effect of the non-abstinence improvement on the course of alcoholism is controversial. Traditionally, total abstinence is the only sure path to recovery, whereas a return to non-problem drinking is regarded as an exception. Research in the last 20 years has been less categorical (Armour *et al.*, 1976; Nordström and Berglund, 1986). Epidemiological studies have found that many alcohol abusers change spontaneously to non-problem drinking (Fillmore, 1987), while clinical studies have concluded that this is less frequent when dependence is more severe (Vaillant, 1983; Edwards, 1986). Vaillant (1996) stated that a longer observation time shows the progressing severity among non-abstinent alcoholics.

In outcome studies using self-rated questionnaires, non-abstinence improvement in many cases does not mean a return to non-problem drinking, but a reduction in the amount and intensity of alcohol drinking. Stability of abstinence and non-problem drinking have been evaluated in a longitudinal investigation (Vaillant, 1996). The stability of non-abstinence improvement, i.e. less problem drinking, has not been evaluated in a similar way. If non-abstinence improvement has stable positive effects on health, then it could be studied in relation to the ultimate outcome, i.e. mortality.

The aim of the present paper was to study long-term mortality in relation to short-term outcome assessed by questionnaires, in order to evaluate the relation between various types of treatment outcomes on mortality.

MATERIALS AND METHODS

The study was performed at Runnagården, a social welfare institution offering both coercive and voluntary care, situated in Örebro in central Sweden. Coercion here refers to compulsory commitment according to Swedish law (LVM)

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(SFS, 1981, 1988), and it should not be confused with criminal law. The study is based on 121 consecutive patients (89 voluntary, 32 compulsorily committed), who completed a 5-week intensive Alcoholics Anonymous (AA)-oriented programme in 1985. The programme and the original sample have been presented in detail (Gerdner *et al.*, 1988, 1996). Twenty-eight per cent were women and the mean age was 41 years (range 26–63). Most patients were severely alcohol-dependent and socially unstable. When a checklist was used to screen the severity of alcohol dependence (National Council on Alcoholism, 1983), 74% were late stage 'chronic' alcoholics, with experiences of binge drinking, delirium tremens, hallucinosis, suicidal thoughts and/or a decrease in tolerance. Most patients (54%) were outside the regular labour market. Seventy-five per cent lived alone. Most patients (65%) were previously admitted to a treatment centre or to a custodial institution due to their alcohol abuse.

Short-term outcome based on questionnaires

The short-term outcome study was performed 45 ± 16.9 weeks (mean \pm SD) after discharge. Mail questionnaires were sent to the former patient and to his/her referring social worker. Patients were asked whether and how their drinking habits had changed since before treatment. They were to use the alternatives 'totally abstinent', 'drank less' and 'the same or more'. The social workers were also asked whether the patient had been abstinent since discharge. They were to use the alternatives 'yes, totally', 'yes, mostly', 'no, drank less', 'no, drank more' and 'no, unchanged'. Such answers were later recoded conservatively to fit the three categories in the patient questionnaire. This method has been presented in detail (Gerdner *et al.*, 1988, 1996). Data on drinking patterns were available for 116 subjects (96%) and were classified as total abstinence ($n = 15$), non-abstinence improvement ($n = 49$) and non-improvement ($n = 52$).

Validation of differences between short-term outcome groups

Questionnaires were returned by 81 patients (67%) and 79 social workers (65%). In 44 cases, the answers were given by both patients and social workers. They agreed in 34 cases (77%) and disagreed in 10 cases (23%). In four cases, the

patient under-reported the improvement, as compared to the social worker, whereas the opposite was true in six cases. In order not to overestimate the outcome, all contradictory answers were coded according to the least favourable.

Independent clinical data on short-term drinking patterns were collected by the assistant assigned to follow up the patients (Gerdner *et al.*, 1996). All information on the progress of each patient after discharge — from patients, relatives and social workers concerning abstinent weeks, drinking weeks and weeks at institution — was continuously collected and monitored on a bulletin board. The weakness of these data was that they were not collected in accordance with a systematic follow-up procedure. The strength was that they were collected continuously. These clinical data showed that the typical drinking occasions that occurred after treatment among these non-abstinent improved patients consisted of one or two relapses, i.e. loss-of-control drinking during more than one night between periods of abstinence. They had, however, improved with regard to number and length of relapses. For only seven of 49 improved patients, the drinking had been limited to so-called 'slips', i.e. one night of drinking not followed by more drinking or inpatient treatment. Thus, the study primarily compares abstinence with less-problem drinking, not with no-problem drinking. Most of those described as 'not improved' (85%) had three or more relapses and/or further inpatient treatment compared to 36% in the 'improved' group.

The patients were classified in three groups according to the clinical data. 'Abstinence' was defined as no drinking episode during the last 12 months, or, if follow-up was <1 year, since discharge. All patients on a new treatment or who had had more than two relapses during the preceding 12 months (or since discharge) were classified as 'not improved'. All others were classified as 'improved'. There was an acceptable agreement between the combined questionnaire outcome and the clinical follow-up groups ($n = 107$, Cohen's kappa = 0.42). Sixty-seven cases were in complete agreement. However, the clinical data showed a worse outcome than the combined questionnaires in 13 cases, whereas the opposite was true in 27 cases. Thus, the combined questionnaires were more conservative than the clinical data, as expected, since the least favour-

Table 1. Expected (E) and observed (O) number of deaths and standardized mortality ratio (O/E) at 8.5 years follow-up in relation to short-term outcome group and gender

	Men				Women				Total			
	O	E	O/E	95% CI	O	E	O/E	95% CI	O	E	O/E	95% CI
Abstainers (13 men/2 women)	0	0.6	0	–	0	0.0	–	–	0	0.6	0	–
Non-abstinent improved (36 men/12 women)	14	1.1	12.7**	6.96–21.35	1	0.2	5.0	0.13–27.86	15	1.3	11.5**	6.46–19.03
Non-improved (31 men/19 women)	8	0.9	8.9*	3.84–17.51	4	0.3	13.3*	3.63–34.14	12	1.2	10.0**	5.17–17.47
All patients	22	2.6	8.5**	5.30–12.81	5	0.5	10.0*	3.25–23.34	27	3.1	8.7**	5.74–12.67

Probability that SMR = 1: * $P < 0.05$, ** $P < 0.01$.

able of two questionnaire replies was chosen. The clinical data were used only for validation and were not further analysed, since they had not been systematically collected.

Long-term follow-up of death certificates

The sample was followed up in January 1994. The mean follow-up time was 8.5 ± 0.27 years. Three subjects had emigrated (one non-abstinent improved, two non-improved). Death certificates were received from Statistics Sweden (Statistiska Centralbyrån). Mortality was compared to the vital statistics for 1990, i.e. to the general population, standardized for age and gender (SCB, 1992).

The causes of death were classified into four groups: alcohol-related (alcoholism, alcoholic psychosis, liver cirrhosis and alcohol intoxication), suicides or probable suicides (E950–959 and E980–989, respectively), other kinds of violent deaths, and other causes of death.

Analytical models

The excess mortality was calculated as the difference between the observed and expected deaths ($O - E$). The standardized mortality ratio (SMR) was calculated giving the ratio of observed/expected deaths (O/E), with the reference value 1 for the general population. The significance of SMR was calculated according to Schmidt and Popham (1980) and the 95% confidence intervals of the SMR according to Ahlbom (1990).

Cohen's kappa measures agreement between different data sources adjusted for random agreement and it is a recommended method for

assessing validity (Hunt, 1986; Maisto and Connors, 1992). SPSS was used for computer calculations (Norusis, 1993).

RESULTS

The mortality in the three outcome groups is presented in Table 1. All 15 abstainers were alive, compared to 27 dead among the 98 others (χ^2 : $P < 0.05$). The total death rate in 27/113 cases was 23.9% for all observed 8.5 years. Thus, the mean annual death rate was 2.8. The excess mortality ($O - E$) among non-abstainers was 24.5 (20.0 men and 4.5 women). Among the non-abstinent improved men, there were six cases of alcohol-related deaths, one case of suicide and four cases of violent death. Among the non-abstinent improved women, the only death was alcohol-related. In the non-improved male group, there were two cases of alcohol-related deaths, one case of suicide and two cases of violent death, and in the non-improved female group there were two alcohol-related deaths and one violent death. Thus, the number of alcohol-related deaths, suicides and violent deaths (16 men and four women) corresponds to 80% of the excess mortality among men and to 90% among women.

Table 1 also presents the SMR (O/E) of the three outcome groups in men and women. An SMR = 1 implies that the number of deaths is the same as the number of deaths expected in the general population. Abstainers had a lower, and all others had a higher, SMR. All non-abstinent men (improved and non-improved) and the non-improved women had an SMR that was signifi-

cantly higher than 1, whereas the non-abstinent improved women had an elevated SMR not significantly different from 1.

DISCUSSION

There were three main findings in this study. First, the death rate after 8.5 years was 24%, with a mean annual mortality rate of 2.8. The number of deaths observed was about nine-fold higher than expected, compared to the general population, standardized for age and gender. The excess mortality corresponded to the number of alcohol-related deaths, suicides and violent deaths. Second, the survival of abstainers differed significantly from that of non-abstainers. Since all the abstainers survived, they tended to have a lower mortality than expected in the general population. All others, both the non-abstinent improved and the non-improved, had elevated mortality ratios. Third, in the small female group, however, only the elevated long-term mortality among the non-improved patients was significant, whereas the non-abstinent improved patients showed a similar tendency but to a lesser extent.

The annual death rate of 2.8 was within the range of other previous long-term (8–20 years) studies on treated alcoholics. Finney and Moos (1991) reviewed 11 studies with annual death rates ranging from 1.6 to 3.7 [Öjesjö, 1981 (epidemiological sample); Pendery *et al.*, 1982; Smith *et al.*, 1983; Vaillant *et al.*, 1983; Westermeyer and Peake, 1983; Barr *et al.*, 1984; Berglund, 1984; O'Connor and Daley, 1985; Taylor *et al.*, 1985; Mackenzie *et al.*, 1986; McCabe, 1986]. Other studies, not included in the review, have also reported annual death rates in this range (Pell and D'Alonzo, 1973; Cross *et al.*, 1990; Finney and Moos, 1991). Annual death rates, however, do not control for confounding factors, such as age and gender.

Eight of the above studies presented O/E mortality ratios based on the general population matched for age, gender and, in some American studies, on race. The O/E ratios ranged from 1.6 to 4.7 (Smith *et al.*, 1983; Vaillant *et al.*, 1983; Barr *et al.*, 1984; Berglund, 1984; Taylor *et al.*, 1985; Mackenzie *et al.*, 1986; McCabe, 1986). Lindberg and Ågren (1988) reviewed seven additional Swedish studies on mortality among alcoholics with O/E ratios ranging from 1.4 (male temper-

ance board clients) to 5.6 (female patients in an alcohol clinic) (Dahlgren, 1951; Salum, 1972; Lindelius *et al.*, 1974; Dahlgren and Myrhed, 1977; Norman, 1979; Ågren and Jacobsson, 1986; National Central Bureau of Statistics, 1986). Lindberg and Ågren (1988) also presented mortality in a clinical sample with O/E ratios of 3.0 and 5.2 (male/female patients). Thus, the SMR in our study was about twice as high or more than in the above studies. Finney and Moos (1992) found an O/E mortality ratio of 9.5. Although this was similar to ours, it should be noted that they compared the alcoholics to a matched control group in which all alcoholics were excluded. Since the general population also includes alcoholics, these figures are not entirely comparable. Therefore, we conclude that the SMR in this study is higher than that previously noted in comparable long-term studies. This is probably related to the serious social and alcoholic state of the studied sample.

Outcome studies often regard non-abstinence improvement as a positive outcome (Emrick, 1974; Brandsmaa and Pattison, 1985). There has also been a discussion of whether or not treatment should strive to achieve abstinence or reduced drinking. Although abstinence is the standard recommendation in most units providing clinical treatment of severely alcohol-dependent patients, some have argued that it would be more realistic to try to reduce the frequency and quantity of drinking, even among the socially unstable and severely alcohol-dependent patients (Pattison, 1976; Pattison *et al.*, 1977; Öjehagen and Berglund, 1989).

Many studies have found abstinence to be related to better survival (Smith *et al.*, 1983; Vaillant *et al.*, 1983; Barr *et al.*, 1984; Mackenzie *et al.*, 1986; Cross *et al.*, 1990). Although only the totally abstinent had the same or lower mortality than that expected, some researchers have observed that non-abstinent improvement reduced the excess mortality more than in the non-improvement group, contrary to our findings. This is probably due to the character of the samples. In our study of severely-dependent and socially unstable patients, one or two relapses indicated improvement according to the social workers as well as the patients. Other studies used more conservative criteria. Mackenzie *et al.* (1986) reported that light drinkers (average of

three drinks/day) had better survival than heavy or binge drinkers, and Cross *et al.* (1990) noted that a stable remission (drinking without intoxication or not more than one intoxication in the preceding year) was better related to improved survival than were intermittent and chronic abuse. In a study on alcoholic women after 8–9 years, Smith *et al.* (1983) found that sporadic drinkers and social drinkers had a lower mortality rate than problem drinkers. Vaillant *et al.* (1983) showed that intermittent alcoholics had a death rate of 29%, i.e. between the rates of stable 'remitters', who were mostly abstainers (10%) and chronic alcoholics (40%). However, all these studies agreed that abstinence reduced the excess mortality more than any other drinking pattern. In contrast, Pell and D'Alonzo (1973) found only a weak relation between the drinking pattern and the mortality among alcoholics in employment. Their study, however, used a classification of 'known', 'suspected' and 'recovered' alcoholics, established by the company physicians without any criteria on the minimum length of abstinence for a classification of 'recovered'.

Our findings demonstrate the importance of abstinence among severely alcohol-dependent and socially unstable patients. Non-abstinent improvement here represented mainly symptomatic intermittent and binge drinking, although less than before. The non-abstinent improved patients had an SMR approximately equal to that of the non-improved, i.e. 11.5 and 10 times that of the general population, whereas the abstinent had a lower SMR than the general population, since none of them had died.

There might be a different pattern among men and women with regard to short-term outcome and mortality. Both men and women benefited most from total abstinence, but, only among women might non-abstinence improvement have a better survival than non-improvement. One obvious shortcoming of this study is the small number of women, which makes it more difficult to detect significant results among them. The trend observed, however, could mean that women have different recovery processes than men. Female alcoholism is more often secondary to, or results in more, depression and anxiety. Female alcoholics drink alone and to obtain relief more often, and they drink to get 'high' less often than male alcoholics (Dahlgren, 1979; Berglund and Öster-

ling 1996). One hypothesis could be that male recovery is more often directly related to drinking itself, and therefore more of an 'ultimatum' (heavy drinking or no drinking), whereas female recovery more often involves other psychological aspects and may be less dichotomous. Possible differences in the natural course and outcome for male and female alcoholics should be studied further.

The validity of differences between the three short-term outcome groups (abstainers, non-abstinence improved and non-improved) was studied both as an agreement between questionnaire replies from patients and social workers, and as an agreement between the combined questionnaires and independent clinical data. The combined data of all questionnaires were somewhat more conservative than the clinical data. Therefore, the finding of this study that non-abstinence improvement did not in general reduce mortality, should not be attributed to follow-up problems in detecting abuse.

In conclusion, reduction in frequency and quantity of drinking was not sufficient to reduce the higher risk of dying in severely alcohol-dependent and socially unstable patients. Only abstinence seemed to be preventive. However, the data indicated possibly different long-term recovery processes among men and women that should be studied further.

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