

Mortality Post Inpatient Alcohol Detoxification: A Descriptive Case Series

Julie Langan Martin^{1,2*}, Alexis McLaughlin², Adam Brodie² and Polash Shajahan^{1,2}

¹University of Glasgow, Scotland, UK

²NHS Lanarkshire, UK

Abstract

Background: Individuals with alcohol dependence often die prematurely. Scotland in particular has high rates of alcohol misuse compared to the rest of the UK and Europe. Although there is some evidence that rates of alcohol-related harm and alcohol-related deaths are reducing in Europe, there is little evidence of this trend occurring in Scotland. Inpatient detoxification is an important, but expensive, option in the management of alcohol dependence. Little work has been done with regard possible clinical characteristics associated with mortality post discharge in this cohort of patients.

Methods: Retrospective electronic records were used to identify patients admitted electively for alcohol detoxification into a psychiatric ward in a district general hospital under the care of a single consultant addiction psychiatrist between 1/1/05 and 31/12/07 inclusively. Demographic and clinical factors were recorded. 5-year mortality data was obtained by linkage to the National Records of Scotland.

Results: 25.2% of patients admitted for elective alcohol detoxification died during the 5-year follow up period. 42.9% of deaths (n=12) were due to alcoholic liver disease, one death (3.6%) was of undetermined intent. A higher proportion of the deceased cohort was likely to have continued disulfiram (93% vs. 80%) and acamprosate (81% vs. 60%) than those surviving. There was no statistically significant difference in survival between individuals on medication and those not on medications in our cohort. The average consumption of units of alcohol per week in the deceased cohort was significantly higher than that calculated for the surviving cohort (298.8 units vs. 233.3 units p=0.0137).

Conclusion: Inpatient detoxification was associated with significant mortality at 5-year follow up post-discharge. The majority of deaths were due to liver disease while deaths due to accidents and of undetermined intent were relatively infrequent. Increased education and practical strategies such as "space and pace" aimed both at an individual and societal level to reduce alcohol consumption may help to reduce mortality associated with alcohol dependence post inpatient detoxification.

Keywords: Alcohol detoxification; Affluent areas; Comorbid polysubstance

Background

Individuals with alcohol dependence often die prematurely [1,2]. Scotland in particular has high rates of alcohol misuse compared to the rest of the UK and Europe [3] and it imposes a substantial burden on Scottish society, costing between £2,475.6 million and £4,635.4 million per year (at 2007/2008 prices) [4]. Scotland's death rate from chronic liver disease and cirrhosis are around twice as high as those in England and Wales and the alcohol-related death rate for women in Scotland exceeds the comparable rate for men in England [5]. Whilst indicators of alcohol-related harm are reducing in countries within Europe [6], in Scotland, there is little evidence to suggest a change in this trend. Over the five-year period 2005/06 to 2009/10 the rate of alcohol-related discharges from psychiatric hospitals in Scotland has remained the same [5] and the economic impact of this to psychiatry alone is vast. In Scotland in 2007/2008 the cost of psychiatric bed days wholly attributable to alcohol was estimated at £39.6 million [4].

Although alcohol use is found across the whole of society, there is a clear socioeconomic trend- with individuals living within the most deprived areas being more likely to experience significant health problems due to their alcohol misuse. In Scotland in 2009/10 the rate of alcohol-related discharges from psychiatric hospitals were 8.5 times greater for patients living in the most deprived areas compared to the most affluent areas [5]. A similar pattern too is seen for acute admissions where in 2011 the rate of alcohol-related discharges from general acute hospitals were 7.6 times greater for patients living in the

most deprived areas compared to the least deprived areas [4].

Many studies have looked at the excess mortality associated with alcohol dependence- with some estimates of an increase in mortality rate of around 2-5 times that of age and sex matched general population controls [2,7,8]. However few studies have looked specifically at the mortality of patients admitted electively to a psychiatric ward for inpatient alcohol detoxification. Here we describe the clinical characteristics of a series of 28 deceased patients who were admitted to inpatient psychiatry electively for alcohol detoxification. We will also compare the age, sex, socioeconomic status, psychiatric comorbidity and estimated weekly units of alcohol of the deceased group with those surviving.

Materials and Methods

We identified a deceased cohort of patients aged 16 to 65, who were admitted to Ward 2 at Wishaw General Hospital for elective alcohol detoxification under the care of one specific Addictions Consultant

*Corresponding author: Julie Langan Martin, University of Glasgow, Scotland, UK, E-mail: julie.langan@glasgow.ac.uk

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between 1/1/05 and 31/12/07 inclusively. A number of clinical and demographic factors surrounding the admission including- age on admission, duration of admission, mental health act use, socioeconomic deprivation quintile, discharge medication and weekly consumption of units of alcohol were recorded. ICD 10 diagnoses were reviewed using the electronic records by JL, AM or PS and any secondary diagnoses were also coded. Weekly consumption of alcohol was obtained from the electronic records. Units per week were calculated from the highest consistently documented recording of alcohol intake. We also determined the number of patients who were recommended to be on disulfiram and acamprosate. It was possible to identify those who were likely to have discontinued the drug at an early stage (only one record suggesting starting the medication and no reference in subsequent records) and those who were likely to have continued their disulfiram or acamprosate (2 or more records showing that the prescription of these medications was still being supported by the specialist or addiction care team).

Date and cause of death was obtained from the National Records of Scotland. Cause of death was coded using the ICD10 diagnostic codes available on the General register for Scotland Website [9]. The study was registered with NHS Lanarkshire's Clinical Quality Services.

Results

From a cohort of 111 patients who were admitted for elective alcohol detoxification during our study period 25.2% of patients died (n=28) during our 5-year follow up. 9 were female (25.7%) and 19 male (25.0%). Mean age at death for the cohort was 43.8 years. In women mean age of death was 44.6 years compared to 43.4 years for males (Table 1). 42.9% of deaths (n=12) were due to alcoholic liver disease

(K70). A further 2 deaths (7.1%) were due to mental and behavioural disorder due to dependence on alcohol (F10), 3 deaths (10.7%) were due to mental and behavioural disorder due to dependence on opiates 1 (3.1%) was due to accidental poisoning of undetermined intent (Table 2).

The average age of the deceased cohort on admission was 40.9 years compared to 38.4 years in those surviving. Rates of comorbid antidepressant and antipsychotic prescription were similar between the deceased and surviving cohorts (Table 2). Median duration of admission for both the deceased and surviving cohorts was similar at 10 and 11 days respectively (Table 2). In both cohorts, those from the most deprived quintile were over-representative making up more than 50% of the population (Table 2).

Rate of comorbid polysubstance misuse was higher in the surviving cohort (39.8%) compared to the deceased cohort (28.6%) (Table 2). The most common comorbid illicit substance misused was heroin.

A higher proportion in the deceased cohort was likely to have continued disulfiram (93% vs. 80%) and acamprosate (81% vs. 60%) although this did not reach statistical significance. The proportion continuing both disulfiram and acamprosate was higher in the surviving cohort (36% vs. 29%) although this also did not reach statistical significance.

In the deceased cohort the average consumption of units of alcohol per week was 298.8 units which was significantly higher than that calculated for the surviving cohort at 233.3 units. (p=0.0137) (Table 3).

In women, mean consumption of units of alcohol per week in both the deceased and surviving cohorts was lower than that in men (Figure 1). There was also a reduction in mean consumption of units of alcohol per week in those surviving compared to those deceased by sex (Figure 1). This was statistically significant in men (245.7 units/week in surviving men vs. 320.2 units/week in deceased men p=0.0316).

Discussion

In recent years the focus has been to promote community-based treatments rather than hospital-based treatments for all mental illness [10] and indeed for the treatment of alcohol or substance misuse disorders [11]. However in-patient psychiatric care remains an essential although expensive treatment option. In particular in-patient alcohol detoxification remains necessary for a significant proportion of patients due to specific medical indications and associated risks [11,12]. Those admitted for in-patient detoxification are generally at high risk of medical morbidities such as seizures, DTs, malnutrition and liver disease [11] and are generally deemed unsuitable for community detoxification. In our cohort of patients admitted for an elective alcohol detoxification one quarter died (25.2%) within the 5-year follow up period. This is comparable to a 4 year mortality rate of 24.0% described by Moors et al. in a cohort of late middle aged and older substance abuse patients [13]. In Germany a study looking at the mortality rate of individuals with alcohol dependence found that "inpatient specialised alcohol dependence treatment did not seem to have a sufficient protective effect against dying prematurely [8]." They also found a mortality rate of 50% in those who had participated in alcohol detoxification inpatient treatment at 14-years follow-up. However to our knowledge this is the only study specifically reviewing the clinical characteristics of deceased individuals admitted to inpatient psychiatry for alcohol detoxification.

In terms of cause of death 42.9% died of alcohol-related liver disease and 7.2% of mental and behavioural disorder due to alcohol, representing approximately half of our cohort. Our finding of only

	Surviving Detoxes (n=83)	Deceased Detoxes (n=28)		
Male (n, %)	57 (68.7%)	19 (67.9%)		
Mean Age at admission [95% C.I.]	38.4 [36.4-40.9]	40.9 [37.4-44.3]	p=0.323	
Mean Age at death females 95% CI		44.6 [36.5-52.8]	p=0.7234	
Mean Age at death males 95% CI		43.4 [39.5-47.2]		
Detained under the Mental Health Act	0 (0%)	1 (3.6%)		
Median duration of stay days, [range]	10 (1-29)	11 (1-66)		
Rate from most deprived quintile (n, %)	42 (56.8%) (42/74)	15 (53.6%)	p=0.772	
Co morbid antidepressant use	17 (20.5%)	6 (21.4%)	ns	
Co morbid antipsychotic use	6 (7.2%)	2 (7.1%)	ns	
Co morbid illicit Substance misuse	33 (39.8%)	8 (28.6%)	p=0.308	
Disulfiram	Suggested for commencement	45 (54%)	13 (46%)	ns
	Likely early discontinuation	9 (20%)	2 (7%)	
	Likely continuation	36 (80%)	11 (93%)	
Acamprosate	Suggested for commencement	47 (57%)	16 (57%)	ns
	Likely early discontinuation	19 (40%)	3 (19%)	
	Likely continuation	28 (60%)	13 (81%)	
Disulfiram & Acamprosate likely continued	30 (36%)	8 (29%)	ns	

Table 1: Clinical & demographic factors of surviving & deceased patients who underwent detoxification.

Cause of Death	n, (percentage)
Alcohol Related Liver Disease	12 (42.9%)
Mental & Behavioural Disturbance due to dependent use of alcohol	2 (7.1%)
Mental & Behavioural Disturbance due to dependent use of opioids	3 (10.7%)
Accidental Deaths	2 (7.1%)
Malignancy	2 (7.1%)
Infective (pneumonia or meningitis)	2 (7.1%)
IHD	1 (3.6%)
Poisoning of undetermined intent	1 (3.6%)
Other (Gastrointestinal haemorrhage, Thrombophlebitis & Cholecystitis)	2 (7.1%)

Table 2: Causes of death.

	Surviving Detoxes (n=83)	Deceased Detoxes (n=28)	
Mean weekly alcohol intake 95% CI	233.3 [209.4-257.2]	298.8 [241.0-356.5]	p=0.0137
Mean weekly alcohol intake men 95% CI	245.7 [214.0-277.5]	320.2 [244.6-395.7]	p=0.0316
Mean weekly alcohol intake women 95% CI	209.2 [176.2-242.2]	253.6 [155.3-351.8]	p=0.234

Table 3: Average weekly alcohol intake in units documented in electronic records.

one death being of undetermined intent is suggestive of a lower than expected rate of suicide. This finding is surprising given the relationship of alcohol dependence with suicide [14] and that severe mental illness including severe depression, psychosis and indeed suicidality [8] are all indications for inpatient detoxification. However our small sample size may be a possible explanatory factor for this finding.

In our cohort the mean age of death following admission for detoxification was for 43.4 years for males and 44.6 years for females. During the equivalent time period, life expectancy in the district (North Lanarkshire) was 74.3 year for males and 78.8 for females. It is well recognised that major mental illness is associated with reduced life expectancy [15-17] and Chang et al. [18] reported a reduction in life expectancy of 13.6 years for men and 14.8 years for women in the UK who have substance misuse disorders. Our findings of a reduction in life years of over 30 years, likely reflects the severity of illness in these individuals given the pre-requisite for inpatient detoxification and may be amplified by the small sample size. Nevertheless this finding of significant premature mortality is a public health concern.

The debate around the effectiveness of disulfiram and acamprostate on long-term survival in alcohol dependence continues. Predicting who will respond best to acamprostate is difficult leading to some authors stating that 'acamprostate should be considered for everyone with alcohol dependence' [19]. Although clinical trials have been more conservative in terms of effectiveness [20], routine clinical practice and economic analysis [21] supports the use of acamprostate when tailored to specific patients and their treatment plans. More recently there has been some evidence that certain genotypes respond better to acamprostate and in the future pharmacogenomics may play a role in identifying such individuals [22]. Our study showed that around half of all patients were at least considered for disulfiram or acamprostate. Of those considered, a greater proportion in the deceased cohort was

estimated to have continued their medications. This supports, with a degree of caution due to the small numbers in our specific study, the position that long-term mortality outcomes may not be affected by being considered for or being on either disulfiram or acamprostate. It is interesting to note that despite the suggestion, prescription, use or likely continuation of disulfiram the deceased cohort still claimed to have to have achieved a higher mean consumption of almost 300 units of alcohol per week.

Our study showed an association between mean maximal weekly alcohol consumption (expressed as units per week) and mortality rate. Those who died within the five year period following admission for detoxification reported that they drank on average, 65 units per week more than the surviving cohort. This relationship of increased alcohol consumption and increased mortality has been shown elsewhere by Breslow and Graubard [23] who reported that men who consumed more than five drinks per day (compared to those who consumed only one) had an adjusted relative risk of mortality of 1.30 for cardiovascular disease (95% confidence interval (CI) 0.96-1.75), 1.53 for cancer (95% CI 1.11-2.09) and 1.42 for other causes of death (95% CI 1.08-1.87). In women they reported an adjusted relative risk of mortality of 2.88 for other causes of death (95% CI 1.61-5.12).

Our study's findings however have a number of limitations. As with all retrospective case note reviews there is the possibility of bias in data collection which is further compounded by particular problems associated with the reporting of alcohol consumption. It is widely recognised that there may be a general under-estimation of self-reported alcohol consumption [24] by patients and this may have impacted on the results seen. Furthermore, we estimated alcohol consumption by documenting the maximal exposure to alcohol consistently recorded in the notes and converting to units/week. Although this does not necessarily reflect total or lifetime alcohol consumption it was felt to be the most reliable method of accurately recording alcohol consumption in this cohort. A further limitation of our data was the small sample size of our cohort. Other individuals who may have undergone alcohol detoxification in our hospital within our study timeframe, likely through an emergency admission were excluded. Given the likely small numbers and heterogeneity of the emergency admissions we included only individuals who received a planned alcohol detoxification under the care of one specific Consultant Addiction Psychiatrist.

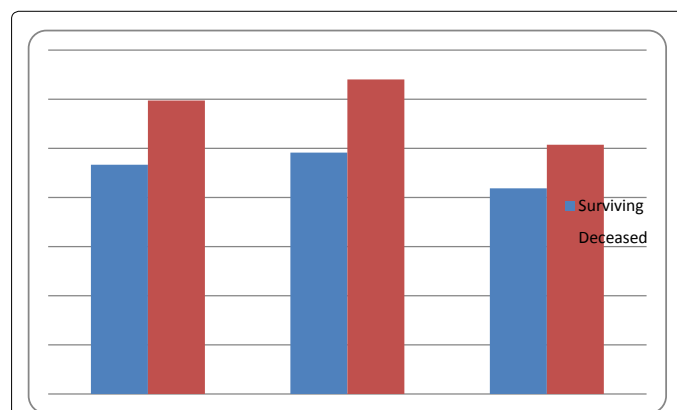


Figure 1: Average weekly alcohol intake in units documented in electronic records.

The Scottish Government has recently moved forward with the proposal for minimum pricing of alcohol [25]. This has been shown to be effective in high income [26,27] countries as well as in low income countries [28] to reduce the harm from alcohol. In Scotland and in particular the West of Scotland which has high mortality rates and high rates of poverty compared to the rest of the UK [29], there remain concerns that such a pricing strategy may affect the poorest sections of society the hardest. This may be of clinical importance given that in our study more than half of the population were from the most deprived quintile. However, clearly strategies aimed at reducing alcohol-related deaths across the whole of society should be considered as potentially beneficial.

In Scotland the number of deaths related to excessive alcohol consumption outweighs those related to drug misuse- in 2011 there were 1,247 alcohol-related deaths [30] compared to 584 drug related deaths [31]. However the resources available for recording deaths due to drug misuse appear to be more comprehensive [32]. Currently in Scotland we have the National drug-related deaths data collection form which is completed by clinicians involved in the care of individuals with drug related problems prior to death. Once completed this data is then entered into the National Drug Related Deaths Database (NDRDD) from which an annual report can be generated. The report collects and analyses all drug related deaths on a national level and subsequently can give advice on prescribing and other important clinical issues to clinicians. Currently there is no equivalent database for alcohol-related deaths and so one challenge for us as health care professionals may be to develop detailed recording databases for alcohol-related deaths. A comparable resource for alcohol-related deaths may provide specific information on causal factors and help in preventing deaths in this particular population.

Given the burden of physical and psychiatric illness associated with alcohol misuse combined with the huge economic cost attributed to its use, clinicians, researchers and policy makers should continue to work together to further develop strategies aimed at reducing the mortality associated with alcohol misuse. Education and practical strategies such as "pace and space", the use of tracker cards and setting of low risk limits should be encouraged to promote safe drinking [33]. However strategies specifically targeted to those who have recently been discharged from inpatient detoxification may be especially beneficial at reducing mortality.

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