TREATMENT

Brief Interventions in Dependent Drinkers: A Comparative Prospective Analysis in Two Hospitals

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Abstract — Aims: To investigate whether brief interventions (BIs) delivered by a dedicated Alcohol Specialist Nurse (ASN) to non-treatment-seeking alcohol-dependent patients in an acute hospital setting are effective in reducing alcohol consumption and dependence. **Methods:** A prospective cohort control study in two acute NHS Hospital Trusts in the North West England, one of which provided BI (university teaching hospital—test site) while the other did not (district general hospital—control site), including follow-up BIs. Subjects were alcohol-dependent patients aged ≥18 years. **Results:** A total of 100 patients were recruited at each site. No differences were found between the groups in the baseline demographic parameters or medical co-morbidities. At the test site, further sessions were sometimes offered, and 46 patients received more than one intervention (median 4, mean 6.3 and maximum 20). At 6 months, alcohol consumption ($P < 0.0001$), Alcohol Use Disorders Identification Tool (AUDIT) score ($P < 0.0001$) and Severity of Alcohol Dependence Questionnaire score ($P = 0.0001$) were significantly lower at the test site than the control site. Outcomes were found to be independent of both the baseline level of dependence and medical co-morbidity. **Conclusion:** BI delivered by a dedicated ASN for non-treatment-seeking alcohol-dependent individuals, who often have significant medical co-morbidities, seem to be effective in an acute hospital setting. This study provides a framework to inform the design of a future randomized controlled trial.

INTRODUCTION

Alcohol dependence is a major problem in the UK. It affects ~3% of the population (Drummond *et al.*, 2005), and leads to significant medical and psychiatric morbidity (Department of Health, 2007). It has been estimated that in England only a small proportion of alcohol-dependent individuals ever seek treatment (Atkinson *et al.*, 2003) and that only 5.6% of alcohol-dependent individuals ever gain access to specialist treatment (Drummond *et al.*, 2005). It is therefore important to determine how to identify those in need of treatment, how to motivate people to engage in treatment and what treatments are available for those who do not seek treatment. There is professional consensus that treatment-seeking indicates treatment readiness (Raistrick *et al.*, 2006). To this end, there has been reasonable criticism that clinical trials of alcohol treatments are 'exclusionist' and recruit 'pure' patients, i.e. non-complex non-co-morbid patients rather than the typical patients often seen in the acute setting (Blanco *et al.*, 2008). Therefore, most trials exclude the more difficult patient groups in terms of engagement (Miller and Wilbourne, 2002; Department of Health, 2005; Raistrick *et al.*, 2006). People who are alcohol-dependent are more likely to have experienced health problems, leading to frequent attendance at acute hospitals (Pirmohamed *et al.*, 2000; Department of Health, 2006a, 2007). Therefore, it would seem both sensible and practical to ensure that this setting is utilized as a major access point for treatment and to test the effectiveness of these treatments.

It is noteworthy that for those patients who are dependent on alcohol, treatments that are brief, timely and pragmatic have received little research attention. This is mainly due to professional consensus, and historical literature, that more complex problems, i.e. alcohol dependence, should be matched to more intensive treatments. Furthermore, assessment of the effectiveness of treatment is complex, particularly as between 12 and 35% of patients recover

naturally, i.e. without treatment (Sobell *et al.*, 1996, 2000; Bischof *et al.*, 2000, 2003). It has also been established that treatments irrespective of their similarities and differences seem to perform equally well (or badly) (Miller and Wilbourne, 2002; Raistrick *et al.*, 2006).

Brief treatments are effective for hazardous and harmful drinkers (Bertholet *et al.*, 2005) and they may also have some efficacy in alcohol-dependent patients (Chick *et al.*, 1985; Bien *et al.*, 1993; Kahan *et al.*, 1995; Fleming *et al.*, 1997; McManus *et al.*, 2003; Smith *et al.*, 2003; Emmen *et al.*, 2004; Guth *et al.*, 2008). However, brief intervention (BI) as a treatment option in acute hospitals has yet to be systematically tested in dependent drinkers (Smith, 1996; Huntley *et al.*, 2001; Patton *et al.*, 2005; Touquet and Paton, 2006).

In this study, we report the results of a prospective cohort study comparing the outcomes of alcohol-dependent patients in two hospitals, one where BI was part of the clinical service, and another where BI was not offered. The aim of this study was to establish whether BI delivered to alcohol-dependent patients in an acute hospital setting are effective in reducing alcohol consumption and dependence.

MATERIALS AND METHODS

Patients

Recruitment occurred at the test and control hospitals between March 2007 and September 2007. The test site is a university hospital in the city of Liverpool, whereas the control site is a district general hospital in the large adjacent town of Warrington. Ethical approval was obtained from Liverpool local research ethics committee (reference number 06/Q1505/12), with Research and Development approval being gained from both NHS Trusts. Each patient gave written informed consent to take part in the study.

To reduce the risk of selection bias, patients were identified by triage clinicians within the Emergency Department

(ED) when there was a suspicion that alcohol was a predisposing factor in attendance. Patients were referred to either the Alcohol Specialist Nurse (ASN) (test site) or the research nurse (control site) who consecutively screened for eligibility using the Alcohol Use Disorders Identification Tool (AUDIT). Patients with a score of ≥16 completed the Severity of Alcohol Dependence Questionnaire (SADQ), and positive patients (any score on the SADQ was considered as positive) were then asked to consent to the study. Exclusion criteria included known intravenous drug use, inability to give informed consent, pregnancy or age under 18 years.

Patients at the treatment site were asked to give written consent to treatment and follow-up and were offered a programme of BI by the ASN. Those at the control site were asked to give written consent to the study and received normal clinical care, which consisted of assessment by the admitting nurse or doctor, and advice regarding community-based services. The research nurse conducted the 6 months follow-up interviews in both groups.

Test site

In the intervention group, an ASN delivered BI of 15–20 min based on a commonly utilized strategy for the delivery of BI (FRAMES: feedback, responsibility, advice, menu of strategies, empathy and self-efficacy) (Bien *et al.*, 1993). The most important element in our use of this model is the exploration of patients' perceptions of the link between their alcohol consumption and their emergency department attendance or hospital admission. There was no predetermined number of treatment sessions. Nurses made a clinical judgment of how many times a further follow-up appointment should be offered. BI took place on each follow-up appointment. The nurses suggested that patients consider a range of options for additional support, including alcohol-specific support such as Alcoholics Anonymous (AA), or other community support groups. Pharmacological adjunct therapy was not prescribed, but information was sometimes given on effectiveness and side effects so that patients could, if they wished, discuss that information with their general practitioner. There were four ASNs at the test site, and patients who attended for follow-up may have seen a different nurse at each occasion.

Six month outcome assessment was conducted by a research nurse, either by telephone or face-to-face as determined by patient choice.

Control site

In the non-intervention group, each patient had a full assessment by the research nurse. Patients received normal clinical care. Follow-up at 6 months post-assessment was conducted by the research nurse via telephone.

Statistical analysis

Based on a previous observational study of dependent drinkers (Cobain, 2009), it was expected that at least 55% of such patients would display a decrease in SADQ score between baseline and follow-up. The natural recovery rate in the control group was expected to be no more than 25% (the literature ranges from 12% with a treatment population up to 35% within a general lifetime population) (Weisner *et al.*,

2003; Bischof *et al.*, 2005). To detect this difference between the groups (55 versus 25%) with 90% power at the 5% significance level, 50 patients were required in each group. In order to allow for an estimated 50% drop out rate, 100 patients were recruited in each group.

All statistical analyses were performed using SAS. Test scores were summarized using descriptive statistics, means with 95% confidence intervals (CIs) (or medians with interquartile ranges if non-normally distributed) at baseline and 6 months. Change from baseline at 6 months post treatment is presented. The hypothesis of no difference between the two treatment arms at 6 months was tested using analysis of covariance, adjusted for baseline measurement. A P-value of 0.05 or less (5% level) was considered to show statistical significance and 95% CIs of the estimated effects were also reported.

RESULTS

A total of 200 patients were recruited during the study period, 100 in each group. Baseline characteristics and alcohol consumption are presented in Table 1. There was no imbalance between the groups at baseline for any measure other than AUDIT. Patients in the intervention group had higher AUDIT scores (mean 33.68; SD 6.06) than patients in the control group (mean 29.74; SD 6.29). The possible effect of this imbalance in the AUDIT score at baseline was adjusted for in the statistical analysis.

The majority of patients were drinking daily (90% in the intervention group, 84% in the control group). There was no difference in the severity of alcohol dependence between the groups; 72% of the intervention group had a SADQ score that was indicative of severe dependence (scoring ≥30), compared with 65% of patients in the control group. Mean SADQ values were 38.56 (SD 14.88) and 35.63 (SD 14.91), respectively for the intervention and control groups.

All test site patients received at least one BI because this immediately followed assessment. Further sessions were offered to, and accepted by, 46 patients; 40 had at least three sessions, with the remainder receiving between 4 and 20 sessions (mean number of further session 6.3; median 4). There was no relationship between number of BI sessions received and availability for the outcome follow-up at 6 months.

Outcome assessment

A follow-up interview was attempted with all 200 recruited patients 6 months after their original assessments. After two letters and two follow-up telephone calls, patients who did not respond were considered to be lost to follow-up. At the 6 month point, in the intervention group, 48% of patients were not interviewed (2% were dead and 50% could not be contacted); in the control group, 50% of patients were not interviewed (7% were dead, 2% were in prison and 41% could not be contacted). Outcomes are presented in Table 2.

Intervention group

Severity of alcohol dependence was reduced in 77% of those followed up ($n = 37$). At 6 months follow-up, 56.2% ($n = 27$) reduced their dependence category to zero, with 36.9% ($n = 19$) reporting total abstinence. Of those patients

who remained dependent, 20.8% (*n* = 10) had reduced their dependence category from severe to mild/moderate. In total, 16.6% (*n* = 8) remained severely dependent, while

6.2% (*n* = 3) remained mild/moderately dependent. There were no cases where the dependence category worsened.

Control group

Severity of alcohol dependence was reduced in 20% (*n* = 10) of patients; none of whom reported total abstinence. Of those patients who remained dependent, none reduced their dependence category from severe to mild/moderate. In total, 54% (*n* = 27) of patients remained severely dependent, whereas 24% (*n* = 12) remained mild/moderately dependent. The dependence category got worse in one patient.

Differences at follow-up

Alcohol consumption and alcohol dependence measures (AUDIT and SADQ) at follow-up and adjusted mean differences between two treatment arms are shown in Table 2. Patients in the intervention group had significantly lower (*P* < 0.0001) SADQ scores than patients in the control group. SADQ scores were 23 (95% CI 17, 30) points lower in the intervention arm. Daily consumption of alcohol and number of drink days were significantly lower (*P* < 0.0001) in the intervention group.

Healthcare utilization

When compared with the control group, patients in the intervention group spent fewer days in hospital, but this difference is not statistically significant (*P* > 0.05) after adjusting for baseline differences (Table 2). Similarly, there was a trend towards fewer emergency department attendances in the intervention group than the control group (*P* = 0.057).

DISCUSSION

We have compared cohorts of alcohol-dependent patients in two hospitals, one where BI was being delivered and one where BI was not in routine use. Our results show that BI delivered in an acute care setting may be effective in reducing measures of alcohol consumption. An important aspect of our study was the comparison of the intervention arm to a usual treatment control arm. This is important as there has been a paucity of research that utilizes non-treatment control groups, making interpretation of the results of such studies difficult, given the rate of natural recovery. The problem has largely been brought about by the fact that when specialist treatment settings are utilized for research, the presenting patients are treatment-seeking and treatment-expectant,

Table 1. Baseline characteristics of the intervention and control groups

	Intervention	Control
Patients	100	100
Median age (IQR) (years)	45 (38, 52)	46 (37.5, 55)
Female (%)	24	34
White British (%)	100	100
Accommodation (%)		
Own	84	93
Hostel	6	0
No fixed adobe	10	7
Living with (%)		
Alone	45	52
Spouse/partner only	24	26
Family	22	18
Others	9	4
Marital status (%)		
Married	18	23
Single	58	36
Divorced/widowed	24	41
Having dependent children (%)	23	24
Occupation (%)		
Employed	9	15
Unemployed	77	57
Retired	7	18
On sickness	5	10
Other	2	0
Smoker (%)	83	67
On alcohol withdrawal medication (%)	53	68
Baseline AUDIT score mean (SD), range	33.68 (6.06), 18–40	29.74 (6.29), 16–40
Baseline SADQ score mean (SD), range	38.56 (14.88), 5–60	35.63 (14.91), 6–60
Baseline SADQ score (%)		
0	0	0
Mild/moderate	28	35
Severe	72	65
Mean no. of units per drink day (SD), range	28.10 (21.65), 6–150	26.26 (20.26), 4–128
Mean no. of drink days (SD), range	6.69 (0.97), 3–7	6.56 (1.07), 3–7
Medical conditions (%)		
Gastro intestinal	34	27
Cardio-vascular	19	25
Mental health	3	11
Neurological	11	13
Respiratory	4	0
Genitourinary	2	1
Musculoskeletal	2	1
Accident & injury	9	10

Table 2. Alcohol dependence and consumption at 6 months, comparing intervention and control groups, adjusted for baseline difference between groups on AUDIT

	Mean		Adjusted mean difference	95% CI	*P*-value
	Intervention (*n* = 48)	Control (*n* = 50)			
SADQ	12.23	30.76	−23.47	−29.76, −17.18	<0.0001
AUDIT	13.50	24.90	−15.71	−20.46, −10.96	<0.0001
No. of units per drink day	8.08	23.00	−17.51	−23.03, −11.99	<0.0001
No. of drink days	3.69	5.62	−2.55	−3.68, −1.42	<0.0001
Length of stay in hospital	2.27	4.72	−1.74	−5.26, 1.79	0.3310
No. of A&E attendances	0.71	1.82	−1.09	−2.21, 0.03	0.0572

which makes it ethically questionable to provide non-treatment control samples within studies (Raistrick *et al.*, 2006). On the other hand, alcohol-dependent patients who present to primary and acute healthcare settings have seldom come seeking treatment for the alcohol dependence (Cherpitel, 1988; Maio *et al.*, 1997; Fortney *et al.*, 1999; Reid *et al.*, 1999; Coder *et al.*, 2008), and often both identification of, and treatment for, alcohol-related problems is either absent or *ad hoc*. This presents an opportunity ethically to design non-treatment control studies within acute hospitals, as we have done here. These two groups (intervention and control) were similar in terms of the presenting co-morbid conditions and other important characteristics, and so we feel that our comparisons of the effect of BI can be justified.

Although the dominant paradigm with the alcohol treatment field seems to be that non-treatment-seeking patients are 'non-treatment-ready' (Raistrick *et al.*, 2006; Assanangkornchai and Srisurapanont, 2007; Freyer-Adam *et al.*, 2008), this is not borne out by our study. We found that non-treatment-seeking patients benefited from the treatment and, when compared with the non-treatment group, had significantly improved outcomes. Furthermore, although 20% of the control group patients improved without treatment, the study was adequately powered to allow for this phenomenon of natural recovery, which has been found in previous studies (Bischof *et al.*, 2000, 2003).

It is widely accepted, and has been demonstrated in several research studies (Miller and Wilbourne, 2002; Moyer *et al.*, 2002; Raistrick *et al.*, 2006), that severity of alcohol dependence is an important predictor of treatment outcome. Consequently, it is sometimes asserted that only mild to moderately dependent patients will benefit from brief treatments. However, our findings show that this may not necessarily be true, with 49% of severely dependent patients no longer dependent and 40% reporting abstinence at 6 months. This is very encouraging, and challenges the results from previous studies; however, we cannot undertake a useful comparison between studies because of methodological differences, such as the settings used for the studies as well as the mode and method for the delivery of the intervention.

Our finding that at 6 month follow-up the treatment group was drinking significantly less than controls can be explained by the higher rates of abstinence (39% compared with 0%). It is therefore important to consider findings from several studies showing that choosing abstinence as a goal resulted in superior outcomes (Duckert, 1993; Sobell *et al.*, 1995; Hodgins *et al.*, 1997; Long *et al.*, 1998 Adamson *et al.*, 2010; Heather *et al.*, 2010). Within the hospital setting, BIs have a limited scope for goal negotiation. The nurses' role in delivery of BI is to reinforce the need for abstinence in those patients with a co-morbid condition, particularly when drinking would exacerbate the condition or be contraindicated (80% of patients in both groups were in this category); for example, patients with liver disease or patients who were prescribed warfarin. Therefore, with the benefit of hindsight, if we had measured patients' preferred treatment goals, it would have been advantageous in the interpretation of treatment group outcome. As we did not do this, we are unable to consider our findings in the context of the UKATT (2005) trial data, which suggested that the non-abstinence preference was more likely in patients with less severe problems

(Adamson *et al.*, 2010), and that those expressing a wish for abstinence reported greater physical and mental ill-health (Heather *et al.*, 2010).

Adamson *et al.* (2010) suggest that clinicians should discuss drinking goals at assessment to form the basis of negotiation; however, this may not always be possible in acute hospital settings. For example, in the treatment of a patient with liver disease, a drinking goal of abstinence may have been imposed by the physician. If we estimate that in 80% of the treatment group, the drinking goal was imposed due to concomitant ill-health, our rates of abstinence at 6 months are all the more surprising, especially given some evidence that patients are more likely to reject a goal that has been imposed (Sanchez-Craig *et al.*, 1984; Sobell and Sobell, 1995). Furthermore, this effect cannot be explained by baseline differences in the level of ill-health between the two groups as these were fairly well matched.

Our data suggest that acute hospitals are an important setting in which to identify and to treat alcohol-dependent patients (Owens *et al.*, 2005; Patton *et al.*, 2007). The component of a planned follow-up by the ASN seems to be an important ingredient that seems to augment the effect of this form of BI. Indeed, it is perhaps the lack of follow-up in Saitz study, which utilized BI on only one occasion, that resulted in a failure to demonstrate differences between treatment and control groups (Saitz *et al.*, 2007).

BIs have previously been described as 'generally restricted to four or fewer sessions, each session lasting from a few minutes to one hour, and are designed to be conducted by health professionals who do not specialize in addictions treatment'. (Heather, 1989; Bien *et al.*, 1993). We were able to demonstrate significant improvements with a median of three treatment sessions, each of 20 min duration. Our interventions differed from previous studies in two distinct ways. Firstly, they were timely in nature, being delivered as the patient presented to hospital. Secondly, they were delivered by a dedicated specialist nurse (ASN). Indeed, the fact that this intervention was delivered effectively by nurses with no extensive training in any psycho-social method is of particular interest. There is an emergent literature that demonstrates that treatment by nurses may be highly cost-effective (Hillman *et al.*, 2001; Frich, 2003; Ryder *et al.*, 2010). Furthermore, at least in the UK, nurses are the largest and therefore most readily available workforce, and are willing to undertake training in this area (Owens *et al.*, 2000). They are potentially an untapped and underutilized resource that could have a major impact on availability and accessibility for the treatment of alcohol-dependent patients, particularly in ED settings, where the health problem is immediate.

'Brief Intervention' is sometimes used as an umbrella term that describes and adheres to a motivational structured approach. How 'brief' is brief is poorly defined in the literature. For example, systematic review and meta-analysis of Bertholet *et al.* (2005) reported a range of 5–45 min duration, and on 1–7 occasions. Poikolainen (1999) made a distinction between very BIs 5–20 min and extended BIs of 30–75 min on several occasions. Therefore, our description of 'brief' refers to the intervention intensity (15–20 min), rather than intervention duration (number of occasions). Ryder *et al* (2010) used the terms brief and extended brief but did not qualify this. NICE (2010) suggests that BI utilized in ED departments should be defined as 'Specific

structured counseling –20–30 min by trained Alcohol Nurse Specialists, using systems based on FRAMES for motivational interviewing'. Indeed, NICE has not helped with this distinction as it has retrospectively applied the term extended BI to studies, but has referred to all motivationally based interventions as 'extended BIs' without defining duration or intensity. Therefore, a reasonable consensus of 'brief' seems to be a 15–30 min intervention on 1–4 occasions. However, ours was a pragmatic study and so the number of interventions was not predetermined; ASNs made a judgment as to how many weeks they tried to keep patients engaged.

It is not surprising that the patients presenting to this setting were in poor health; 88% had previous or current medical co-morbidity, with 51% having two or more medical co-morbidities. Unfortunately, there is a paucity of literature on which to compare our population, as co-morbidity often features as an exclusion criteria from participation in research trials. Nevertheless, this study failed to find a relationship between co-morbidity and treatment outcome ($\chi^2 = 0$, $P > 0.999$). This raises a question as to why sick patients in need of treatment are excluded from alcohol treatment trials. Perhaps, it is that the traditional alcohol treatment settings are inappropriate for such patients. If this is the case, then surely there is a need to provide an effective alternative (Gossop *et al.*, 2007). This is even more important when considering that traditional psychiatric settings have reported that patients' physical health problems are likely to be unidentified or neglected (Department of Health, 2006b; Gossop *et al.*, 2007). Furthermore, this population, known to have significant health problems, would be expected to be heavy consumers of healthcare services. In our study, the treatment group utilized less hospital services in terms of length of stay and ED attendances compared with the control group, but this failed to reach statistical significance after adjustment for baseline differences, presumably because of the sample size.

LIMITATIONS

Although these are promising results, there is a risk of bias in the evaluation of outcomes, because the research nurse knew in many cases at the time of the follow-up telephone interview that whether the patient had been recruited in the test hospital or in the control hospital. Furthermore, there are some limitations to the study generalizability. Firstly, there could be some debate around whether these interventions are truly brief as the number of follow-up appointments was not pre-determined. They could therefore be conceptualized as a more extended form of BI. Secondly, although patient characteristics such as the level of alcohol dependence, alcohol consumption, age, sex and employment status were similar for both populations at baseline assessment, as the study was conducted in different hospitals, it cannot be completely established that the populations were in fact comparable. Furthermore, we cannot truly exclude the possibility that operational differences in the individual hospitals were a factor in the significant differences at 6 month follow-up. Thirdly, due to the lack of available comparative studies, we pre-specified a very conservative estimate of 50% follow-up for our power calculations. This created two difficulties in

our analysis: (a) the sample size was such that we were unable to determine the optimal number of treatment sessions, or control for extraneous variables, and (b) although there was a strong positive correlation between treatment and primary outcome, the low follow-up rate means that we cannot ascertain the absence of any confounding factors in those that were unable to be followed up. Lastly, we did not ascertain whether patients had accessed other alcohol treatment services following recruitment into the study. Neither site had AA or other support services available however; patients can access a range of local services. Therefore it would be important to consider this in future study design.

Recommendations for future research and conclusion

We suggest that this research should be followed by a randomized controlled trial (RCT) of BI in alcohol-dependent patients. This study provides a framework for the design of such a study. We have learned some lessons for methodological design. The SADQ, when utilized as an outcome measure, has the potential to produce false results for dependence as it is less sensitive to change over time. Future studies may need to use a more sensitive tool such as Leeds Dependency Questionnaire (Raistrick *et al.*, 1994). Furthermore, a robust strategy needs to be in place to ensure that at least 70–80% follow-up is achieved, which would allow comparisons with other outcome studies. As discussed already, assessment of treatment goal and its effect on outcome would also be of interest in a future study.

We suggest that the ED is a useful setting for identification and treatment of alcohol-dependent patients who, although having significant medical co-morbidity, can respond well (c.f. Touquet and Brown, 2006). We suggest that brief treatments given in a patient-centred way by a dedicated nurse in an acute hospital setting can (a) reduce the burden to healthcare services, (b) improve treatment quality, (c) improve treatment equity and potentially (d) improve patient outcomes and functionality.

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