Treatment Outcome of Alcohol Use Disorder Outpatients With or Without Medically Assisted Detoxification

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ABSTRACT. **Objective:** Little is known about the incremental effects of medically assisted detoxification on outpatient treatment for alcohol use disorders. The objective of this study was to compare drinking outcomes in a psychosocial treatment program between two groups of heavy drinking patients who had an alcohol use disorder: (a) one group with initial medically assisted detoxification and (b) a second group without initial medically assisted detoxification. **Method:** Analyses were conducted on 262 patients with a more severe alcohol use disorder who completed both an intake assessment and a 9-month follow-up assessment. The effect of medically assisted detoxification was determined using logistic regression analysis with a propensity score to control for possible baseline differences between the two groups. **Results:** Of the 262 patients, 82 (31.3%) received medically assisted detoxification. These patients were more likely to abstain from alcohol than those without medically assisted detoxification. Abstinence rates in the month before follow-up were 32.9% and 18.9%, respectively (OR_{adj} = 3.48, p = .01, number needed to treat = 7.1). **Conclusions:** Medically assisted detoxification may add to the effects of outpatient psychosocial treatment for heavy drinking patients with an alcohol use disorder. (*J. Stud. Alcohol Drugs, 75,* 993–998, 2014)

THERE IS CONVINCING EVIDENCE that pharmacotherapy can substantially improve the effectiveness of psychosocial treatment for patients with alcohol dependence (De Sousa, 2010; Garbutt et al., 1999; van den Brink, 2012). However, the added value of medically assisted detoxification in the context of outpatient psychosocial treatment has not been systematically studied, although it is considered an important component in the treatment of patients with an alcohol use disorder (Myrick et al., 2003). Medically assisted detoxification is most appropriate if severe withdrawal symptoms are expected after the patient has started to abstain from alcohol.

Medically assisted detoxification is generally defined as the medical management of an acute withdrawal syndrome in a controlled setting, normally a clinic (Myrick et al., 2003). The goals of medically assisted detoxification are (a) to interrupt the process of compulsive alcohol use, (b) to provide withdrawal that is humane and which protects the patient's dignity, (c) to prevent or treat complications, such as delirium and seizures, (d) to initiate a period of abstinence, and (e) to prepare the patient for continuing treatment. This period can also be used to initiate medications to help prevent relapse (Blondell et al., 2011; Center for Substance Abuse Treatment, 1995). Although detoxification alone is not considered to be an adequate treatment for patients with an alcohol use disorder, integrating detoxification services into a treatment aimed at abstinence or reduced drinking may be important (Institute of Medicine, 1990; McLellan and McKay, 2003).

During the last 15 years, most of the larger substance use disorder treatment centers in the Netherlands have redesigned their services to align them with recommendations of the Institute of Medicine (1990) regarding alcohol treatment services (Schippers et al., 2002). The redesign focused on three important components: (a) implementing evidence-based psychosocial interventions, (b) incorporating a system of regular monitoring and feedback of clinical outcome, and (c) standardizing the process of allocating patients to levels of care based on the stepped-care model (Sobell and Sobell, 2000). Implementation of these components provided opportunities to study the effectiveness of treatment that was routinely provided using naturalistic designs (Glaser, 2001; Merkx et al., 2007, 2011, 2013).

Stepped care is based on the principle that treatment should be (a) individualized, (b) evidence-based and supported by clinical judgment, and (c) least restrictive but still likely to be effective. Used in this way, stepped care emphasizes serving the needs of patients in the most efficient way without sacrificing quality of care (e.g., Berner et al., 2008; Drummond et al., 2009; Jaehne et al., 2012; Sobell and So-

bell, 2000). In a stepped-care program for patients with an alcohol use disorder, it is very important to determine which patients are at risk for alcohol withdrawal complications and may thus need medically assisted detoxification. However, our treatment allocation protocol (Merkx et al., 2007) lacked explicit rules for clinicians to decide whether patients should be offered medically assisted detoxification.

In the current study, we used this omission as an opportunity to answer the following question: Are there differences in drinking outcomes between those patients with a more severe alcohol use disorder treated in a psychosocial outpatient treatment program who received and those who did not receive medically assisted detoxification?

Method

Sample

Analyses were conducted on clinical data from a large regional substance use disorder treatment center in the Netherlands that served a catchment area of approximately 1 million people. Between January 2004 and February 2007, 1,626 patients with an alcohol use disorder were treated in the psychosocial outpatient program at this center (Figure 1).

Based on results from the European version of the 5th Edition of the Addiction Severity Index (EuropASI; Kokkevi and Hartgers, 1995) and consistent with World Health Organization (WHO) criteria for defining medium to high risk of chronic harm attributable to alcohol use (WHO, 2000), we arbitrarily defined patients as potentially eligible for medically assisted detoxification if they had at least 20 heavy drinking days (≥5 drinks/≥50 g per day) in the 30 days before intake. At intake, 509 patients (31.9%) did and 524 patients (32.2%) did not meet this criterion; 593 (36.5%) patients could not be included because they had a missing value on number of heavy drinking days in the 30 days before intake. Of the 509 patients who were eligible for medically assisted detoxification, 163 (32.0%) received detoxification and 346 (68.0%) did not. We were able to contact 262 (51.5%) of the 509 patients for the 9-month follow-up assessment; of these, 82 (31.3%) did and 180 (68.7%) did not receive medically assisted detoxification.

Treatment allocation process

Intake and treatment allocation were conducted according to a protocol based on data collected with the EuropASI (Merkx et al., 2007). The EuropASI is a semi-structured interview that provides ratings of problem severity in the following domains: medical, employment/education, alcohol, other drugs, legal, family/social support, psychiatric, and gambling behavior. However, the need for medically assisted detoxification was not included in the treatment allocation model; therefore, the decision to allocate patients to a medi-

cally assisted detoxification program was not standardized. The physician assigned to the outpatient treatment program decided whether to allocate each patient to a medically assisted detoxification program based on the patient's medical history (e.g., alcohol consumption, previous withdrawal complications, instability of housing) and routine physical examination (e.g., presence of edema, ascites, or extreme underweight).

Medically assisted detoxification

Medically assisted detoxification was designed as a day-care or residential program to actively treat patients' alcohol withdrawal symptoms with pharmacotherapy and to facilitate their ongoing treatment. The programs were roughly comparable with an American Society of Addiction Medicine (ASAM) level II–IV detoxification (Mee-Lee et al., 2001). Patients entering the medically assisted detoxification stayed in the program for a mean 9.60 days (SD = 5.29) and were subsequently referred to the outpatient psychosocial relapse-prevention program.

Outpatient treatment

The outpatient program mainly consisted of evidence-based and manual-guided psychosocial interventions (Kadden et al., 1992; Marlatt and Gordon, 1985; Miller and Rollnick, 2002; Miller et al., 1992; Monti et al., 1989). Outpatient treatment was conducted either individually or in a group over a period of 3 to 6 months. Depending on each patient's needs, additional treatments—including treatment for comorbid psychiatric disorders or social skills training—could be offered. Although the outpatient treatment facility was not strictly abstinence oriented (reduced drinking was an option), its policy was for intake counselors to advise every patient with a more severe alcohol use disorder to refrain from alcohol use for at least a certain period.

Measures

Existing patient files and databases were used to extract patient and treatment information, such as patients' demographic characteristics, their service utilization, and the type and amount of treatment received during the treatment episode. Since 2003, the treatment center personnel have routinely tried to contact all patients for a telephone follow-up interview (Oudejans et al., 2009). These interviews were conducted 9 months after the intake assessment and focused primarily on the patient's alcohol use during the preceding 30 days.

Outcome measure

Treatment success was defined as abstinence from alcohol during the 30 days before the follow-up interview.
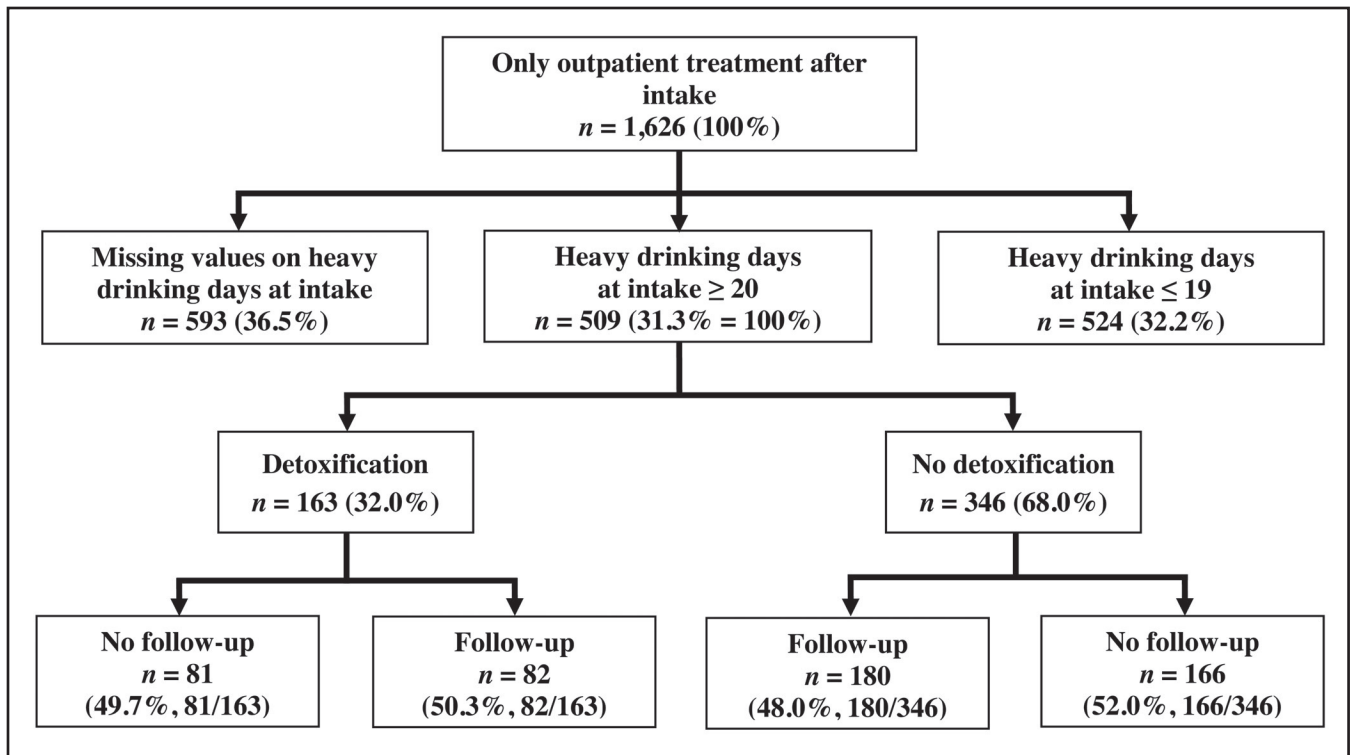
FIGURE 1.   Flowchart showing progression of participants through each stage of the study

Statistical analysis

Differences in baseline characteristics between patients who had or had not received medically assisted detoxification and between those who had or did not have a follow-up interview were assessed using *t* tests or chi-square. The effect of medically assisted detoxification was determined using logistic regression analysis, with medically assisted detoxification (with or without) as the independent variable and abstinence (yes or no) as the dependent variable. To reduce the risk of selection bias in this naturalistic study, we included a propensity score (Bartak et al., 2009) as a covariate. The propensity score was based on the following baseline measures known to be related to treatment outcome (Trim et al., 2013): (a) age at onset of alcohol use, (b) age at onset of heavy drinking, (c) regular use of an illicit drug or gambling, (d) EuropASI severity rating of medical problems, (e) EuropASI severity rating of alcohol problems, (f) EuropASI severity rating of other drug problems, and (g) EuropASI severity rating of psychiatric impairment.

Results

Participants' baseline characteristics and alcohol use

The mean age of the subsample eligible for medically assisted detoxification (*n* = 262) was 45.9 years (*SD* =10.6);

78.6% were single, and 87.6% were of Dutch nationality. Almost one third (30.1%) also reported regular use of an illicit drug or gambling. In the 30 days before the baseline assessment, the subsample had a mean of 27.7 (*SD* = 3.6) heavy drinking days and 1.80 (*SD* = 3.26) abstinent days, and 64.5% of the patients reported 30 heavy drinking days.

At intake, there were no significant differences between the two treatment groups in age, gender, nationality, number of heavy drinking days, or number of abstinent days. However, the treatment group that received medically assisted detoxification had a greater proportion with a EuropASI problem severity rating of 5 or more (moderate problem, some treatment needed) on the domains medical, alcohol, other drugs, and psychiatric impairment than those not receiving medically assisted detoxification. These results are shown in Table 1.

Follow-up responses

Of the 509 patients who were potentially eligible for medically assisted treatment, we were able to contact 262 (51.5%) for follow-up. The mean time between the intake interview and the follow-up interview was 9.9 months (*SD* = 0.8). Patients with a follow-up interview were comparable to those without a follow-up interview on their respective number of baseline abstinent days (1.8 days [*SD* = 3.2] vs. 2.1 days [*SD* = 3.3]), *t*(1, 507) = .88, *p* = .38, and the num-

TABLE 1. Patients' baseline characteristics stratified by detoxification status

Variable	Total sample (N = 262)	More severe alcohol use disorder with detoxification (n = 82)	More severe alcohol use disorder without detoxification (n = 180)	p
Age in years, M (SD)	45.85 (10.58)	46.07 (10.81)	45.76 (10.50)	.83
Gender[a] (% male)	77.9	79.3	77.2	.71
Marital status[a]				.41
% Married	21.4	18.3	22.8	
% Currently single	78.6	81.7	77.2	
Nationality				.11
% Dutch	87.6	82.9	90.0	
% Other	12.2	17.1	10.0	
Illicit drug use[b]				.11
% Yes	30.1	37.2	27.1	
Alcohol use at intake, M (SD)				
Abstinent days	1.80 (3.26)	1.73 (3.05)	1.83 (3.35)	.44
Heavy drinking days	27.68 (3.62)	27.96 (3.30)	27.54 (3.77)	.39
Age at onset of alcohol use	19.62 (6.60)	19.17 (5.82)	19.84 (6.94)	.48
Age at onset of HDD[c]	29.50 (10.64)	27.48 (9.07)	30.42 (11.19)	.04
EuropASI Severity Rating ≥ 5[d]				
Medical problems	7.8	15.7	4.5	.002
Alcohol severity	86.2	96.3	81.6	<.001
Drugs severity	10.6	15.9	7.9	.05
Psychiatric impairment	20.5	28.5	16.2	.03
Vocational/education	12.5	16.3	10.9	.23
Family/social	10.5	12.5	9.6	.48

Notes: EuropASI = European version of the 5th Edition of the Addiction Severity Index. [a]Missing values up to 22%; [b]regular use of an illicit drug or gambling; [c]heavy drinking days = ≥5 drinks/≥ 50 g per day; [d]Interview Severity Rating ≥ 5, indicating a moderate problem, some treatment needed.

ber of baseline heavy drinking days (27.8 days [SD = 3.4] vs. 27.7 days [SD = 3.6]), $t(1, 507) = 379$, $p = .71$, in the 30 days before intake. The two groups also had comparable EuropASI severity ratings. However, compared with patients who did not have a follow-up interview, patients who had a follow-up interview were older (45.9 vs. 43.8 years), $t(1, 507) = 2.20$, $p = .03$, and a greater proportion of them were of Dutch ancestry (87.8% vs. 77.7%), $\chi^2(1) = 9.07$, $p = .003$. Although statistically significant, these differences were relatively small and were not considered clinically relevant.

Treatment outcome

At follow-up, 23.3% of the patients were abstinent. Patients receiving medically assisted detoxification were more likely to be abstinent than patients not receiving this treatment: 32.9% versus 18.9% (number needed to treat = 7.1; $OR_{adj} = 3.48$, 95% CI [1.68, 7.18], $p = .001$) (Table 2).

Discussion

The current study shows that patients with a more severe alcohol use disorder allocated to outpatient psychotherapy do benefit from pretreatment medically assisted detoxification in a day-care or residential setting and are significantly more likely to abstain from alcohol at follow-up than patients who do not receive such a medically assisted detoxification (31.9% vs. 18.9%, respectively).

The current study has several strengths. It was conducted in a naturalistic setting with a large, unselected sample of

TABLE 2. Effects of detoxification status on abstinence at follow-up (n = 197)[a]

Variable	B	SE (b)	Wald	p	Odds ratio	95% confidence interval lower	upper
Intercept	-1.30	-0.42	9.49	.002	0.27		
Detoxification	1.25	0.37	11.33	.001	3.48	1.68	7.18
Propensity score[b]	-1.05	1.24	0.72	.40	0.35	0.03	3.95

[a]Logistic regression analysis with treatment responder strict (abstinent) as the dependent variable, detoxification status as the independent variable, and propensity score as the covariate; [b]propensity scores are based on baseline variables known to be related to outcome (Trim et al., 2013): (a) age at onset of alcohol use, (b) age at onset of heavy drinking, (c) regular use of an illicit drug of use or gambling behavior, (d) EuropASI severity rating of medical problems, (e) EuropASI severity rating of alcohol problems, (f) EuropASI severity rating of other drug problems, and (g) EuropASI severity rating of psychiatric impairment.

patients with a more severe alcohol use disorder. In addition, the treatment was standardized, but the usual-care conditions were preserved.

The study also has limitations. First, allocation to medically assisted detoxification was not a randomized controlled trial and was based on clinical judgment only. Therefore, we cannot rule out the possibility that the observed benefits of medically assisted detoxification are (partly) attributable to selection bias or confounding, especially because there were some baseline differences between the two treatment groups. To control for the possible effect of relevant baseline differences, we applied propensity score analysis, and the adjusted effect on abstinence at follow-up remained significant. However, we cannot fully exclude residual confounding by baseline differences that were not measured, such as level of motivation or preferred treatment goal (abstinence vs. reduced drinking). However, there is no consistent evidence that motivation and preferred treatment goal are associated with treatment outcome (Adamson et al., 2010; Bujarski et al., 2013; Sanchez-Craig and Lei, 1986; Sanchez-Craig et al., 1984; Schippers and Nelissen, 2006).

Second, our operationalization of a more severe alcohol use disorder (≥20 heavy drinking days per month with a heavy drinking day meaning ≥5 units of alcohol in 24 hours) was arbitrary. However, in general, the amount of alcohol consumption related to the risk of developing alcohol dependence and the relationship between frequency of harmful drinking and severity of alcohol dependence appears to be linear (Li et al., 2007; Rehm et al., 2013; Rubinsky et al., 2013). In addition, using 50 g of alcohol per day as a definition of a heavy drinking day is consistent with the definition that other researchers have used (e.g., Nutt and Rehm, 2014; Plunk et al., 2014).

Also, according to the recommendations of the World Health Organization, our definition of a more severe alcohol use disorder constitutes a medium to high risk of developing acute problems and chronic harm for men and a high risk for developing acute problems and chronic harm for women (WHO, 2000). Therefore, we believe that 20 or more heavy drinking days per month is a good operationalization of a more severe alcohol use disorder with an increased risk of more severe alcohol withdrawal symptoms and an increased need for a medically assisted detoxification. The actual data from the study empirically support this belief: Participants who were identified as patients with a more severe alcohol use disorder were drinking nearly a daily amount of alcohol that is considered to be medium to high risk for developing chronic alcohol-related harm (WHO, 2000).

However, it is still possible that the subgroup of participants who received medically assisted detoxification drank more alcohol on their heavy drinking days than those who were not detoxified and that their alcohol-related problems per month represent a more severe alcohol use disorder. If this had been the case, our results would have been even stronger, because this would represent a bias toward the nil (i.e., the observed effect of medically assisted detoxification is likely to be an underestimation of the real effect).

Third, only 52% of the baseline sample was included in the final analysis, and this may have implications for the validity of the results. However, because patients with or without a follow-up interview were comparable on all baseline measures related to outcome, including the number of abstinent and heavy drinking days before intake, the effect of nonparticipation is likely to be small. Finally, the study was conducted in routine clinical practice with data that trained clinicians routinely collected. Although this procedure did not guarantee optimal data quality, it is very unlikely that there were systematic differences in how the two groups were assessed.

In summary, the present study provides evidence that medically assisted detoxification may have an incremental effect on outpatient treatment outcomes for patients with more severe alcohol use disorders. However, well-controlled studies are lacking, and further research using randomized controlled designs is needed to confirm the added value of medically assisted detoxification for patients with a more severe alcohol use disorder. This is important to establish inasmuch as it has already been shown that patients who are able to abstain from alcohol early in the recovery process have better treatment outcomes (Maisto et al., 2006).

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