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Short communication

Reductions in physical pain predict lower risk of relapse following alcohol treatment

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ABSTRACT

Objective: Physical pain is considered a potential predictor of relapse in alcohol-dependent individuals after treatment. The aim of this study was to evaluate whether reductions in pain level during the follow-up period after treatment were associated with lower relapse risk.
Method: A sample of 366 participants was recruited from alcohol treatment centers in Warsaw, Poland. At baseline, information was obtained about pain level, demographics, childhood abuse, impulsivity, depressive symptoms, severity of alcohol and sleep problems. After finishing the alcohol treatment program, patients were followed for 12 months and alcohol drinking (relapse) as well as pain severity were evaluated.
Results: In the followed-up group, 29.5% of patients confirmed that they drank any alcohol during past 4 weeks. Comparing follow-up to baseline pain, 48.6% of subjects reported an increased severity of pain, 28.8% reported the same level of pain, 22.6% reported decreased level of pain. There was a significant association between the decrease in level of pain and the lower risk of relapse. Other factors associated with relapse during 4 weeks prior to the follow-up were baseline severity of depressive symptoms, low baseline social support and number of drinking days during 4 weeks prior to entering treatment. In multivariate analysis, a decrease in pain level was associated with a lower likelihood of relapse (OR = 0.159; 95%CI:0.04–0.62; $p = 0.008$) even when controlled for other factors associated with relapse.
Conclusions: Decreases in pain level following treatment for alcohol dependence are associated with, and may contribute to, a lower risk of alcohol relapse.

1. Introduction

Heavy alcohol use is a major contributor to social and economic harm. In Poland, about 3% of the Polish general population meets criteria for alcohol dependence and another 5–7% of the population drinks alcohol in a harmful way (PARPA, 2008). Alcohol use disorder (AUD) treatment (Connors et al., 1996) is generally associated with improved longer-term outcomes relative to no treatment, but post-treatment relapse remains a significant problem (MATCH, 1997; Moos and Moos, 2006).

One potential factor that could relate to alcohol relapse is physical pain. Population studies, as well as data from clinical settings, indicate that pain and alcohol dependence commonly co-occur (Jakubczyk et al., 2015; Subramaniam et al., 2013; Von Korff et al., 2005). In addition, in adults entering inpatient AUD treatment, physical pain is associated with sleep problems, general psychopathology and severity of alcohol dependence (Jakubczyk et al., 2015), all of which are considered important risk factors for relapse (Boschloo et al., 2012; Bottlender and Soyka, 2005; Brower, 2003; Loree et al., 2014). Therefore, it is possible that physical pain could be associated with the risk of alcohol relapse. Prior studies of adults treated for a mixture of drug and alcohol problems found that higher pain predicts greater use of substances following treatment (Caldeiro et al., 2008). However, it is unclear if these results would generalize to AUD samples. In addition, Witkiewitz and colleagues (2015) utilized data from two large clinical trials and found that

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greater physical pain at baseline was associated with increases in heavy drinking, as well as drinking lapses, during and following alcohol use disorder treatment.

The present study extends Witkiewitz's work by studying the association between pain and AUD outcomes under real-world (non-experimental) treatment conditions. Specifically, we evaluated whether reductions in pain level during the follow-up period were associated with lower relapse risk after controlling for other potential predictors of relapse (Boschloo et al., 2012; Bottlender and Soyka, 2005; Brower, 2003; Loree et al., 2014).

2. Material and methods

2.1. Participants

The study received approval from the Bioethics Committee at the Medical University of Warsaw and the Medical School Institutional Review Board at the University of Michigan.

For this study, a group of 366 alcohol-dependent individuals entering abstinence-based, inpatient treatment programes in Warsaw, Poland, was recruited. The inclusion criteria were age more than 18 and a current diagnosis of alcohol dependence according to the DSM-IV criteria (A.P.A., 2000). The exclusion criteria were a history of psychosis, co-occurring psychiatric disorder requiring current medication and the presence of acute alcohol withdrawal symptoms. Individuals with dependence on other psychoactive substances (with the exception of tobacco) were not admitted to the study sites and, therefore, not included in the present sample.

2.2. Procedures

The study employed a prospective design and the protocol was divided into two parts: baseline assessment (within a week from admission to the study site) and follow-up. The detailed results and procedures of the baseline assessment can be found in Jakubczyk et al. (2015). After finishing the alcohol treatment program, the patients were followed for approximately 12 months and alcohol drinking (relapse) as well as pain severity were evaluated. Specifically, the follow-up assessment meeting was arranged by phone; if phone contact was not available, a member of the research team was sent to the patient's declared place of living. If the phone or personal contact was successful, relapse and pain severity at follow-up were assessed using the measures described below.

2.3. Measures

2.3.1. Relapse. In this study, the main outcome was *alcohol relapse*, defined as "any drinking during the last 4 weeks" based on participant self-report on the University of Arkansas Substance Abuse Outcomes Module (SAOM; Smith et al., 1996) during the follow-up assessment. In addition, the data from Time-Line Follow Back (TLFB) interview during follow-up (Sobell et al., 1979, 1988) were analyzed. If any drinking day was reported in TLFB during past 28 days, the patient was also considered to have relapsed. The present analyses use 28 day relapse in order to match the period of time assesed in the question concerning the level of physical pain (see below). The categorical designation of any alcohol use as relapse is consistent with other studies (Bauer, 2001; Bowden-Jones et al., 2005; Cardenas et al., 2011) and was also associated with the aim of the therapy (total abstinence) provided in the treatment setting where the study was conducted.

2.3.2. Physical pain. The level of physical pain during the past 4 weeks was evaluated with a question from the Polish version of Short Form Health Survey (SF-36; Zolnierczyk-Zreda, 2010). This question asked, "During the last 4 weeks, how much of physical pain did you experience?". The response options were labeled as follows: 1—no pain, 2—very mild pain, 3—mild pain, 4—moderate, 5—strong, 6—very strong physical pain during past 4 weeks. For the present analysis and consistent with the methodology of other studies (Potter et al., 2008; Rosenblum et al., 2003; Trafton et al., 2004), the group was divided into a "mild or no pain" group (responses 1–3) and "moderate or greater pain" group (responses 4–6). Pain intensity during the past 4 weeks was assessed both at the baseline and follow-up assessments.

In addition, in order to evaluate the changes of pain intensity during the follow-up period, we compared specific responses (on a 1–6 scale) at baseline and follow-up for each patient, and re-categorized all responses into:

An increase or no change in pain level compared to those who reported a decrease in pain level. This variable, *decrease in pain*, was our primary variable of interest in the study protocol and in our analyses of relapse. The decision to categorise pain into "decreasing versus not" was made to facilitate interpretation and to enhance the potential clinical implications of the findings.

2.3.3. Control variables. The severity of depressive symptoms was evaluated with the Beck Depression Inventory (BDI; Beck et al., 1996). For the purpose of this study, the validated Polish version of the questionnaire was used ($\alpha = 0.92$; Zawadzki et al., 2009).

The severity of sleep problems was assessed with the validated, Polish version of Athens Insomnia Scale (AIS; Fornal-Pawlowska et al., 2011.) (Cronbach's Alpha for this study 0.93). The level of impulsivity was measured by the Polish version of Barratt Impulsiveness Scale (BIS-11; Patton et al., 1995) which is a subjective measure of impulsivity. In this study, the BIS-11 global score was analyzed ($\alpha = 0.83$).

Severity of nicotine use was evaluated by the Fagerstrom Test for Nicotine Dependence (FTND; Heatherton et al., 1991) and the level of social support using the Medical Outcomes Study Social Support Survey (MOSSSS; Sherbourne and Stewart, 1991) ($\alpha = 0.89$).

Questions regarding experiences of sexual and physical abuse before the age of 18 are detailed elsewhere (Zhabenko et al., 2012). The severity of baseline alcohol dependence was evaluated using the Polish version of Michigan Alcoholism Screening Test (MAST; Selzer et al., 1975; Falicki et al., 1986; Habrat, 1988).

2.4. Statistical analysis

The first set of analyses compared those who relapsed to those who did not on measures of pain, as well as basic demographic characteristics, severity of alcohol dependence, depressive symptoms, sleep problems and nicotine dependence at the baseline. Comparisons between groups were deemed significantly different if a two-tailed test was $p < 0.05$.

All variables that were significant in the primary analyses were entered into a logistic regression analysis in order to ascertain the independent significance of decrease in pain as a correlate of relapse in alcohol-dependent patients. In addition, gender, age and education (which was the single variable that differentiated the followed and not-followed group) were entered into the multivariate model as control variables.

3. Results

3.1. Relapse

Follow-up data were available for 50% of individuals ($n = 183$) who completed the baseline assessment. In the followed group, 29.5% of patients confirmed that they drank any alcohol during