Inhibition Training in AUD: Mechanisms of Change, Drinking Trajectories and Predictors of Outcome

Summary

Novel computerized training interventions aim to directly interfere with altered processes involved in addictive behaviors, such as approach tendencies, cue reactivity or deficient inhibition. Such trainings can be a cost-effective add-on to traditional cognitive behavioral relapse prevention strategies.

In an ongoing randomized controlled, double-blind, multicenter study supported by the Swiss National Science Foundation (SNF), a computerized alcohol-specific inhibition-training (Alc-IT) is evaluated in abstinent patients with AUD undergoing standard inpatient relapse prevention treatment. During this Alc-IT, patients are requested to respond to different pictures by a button press and to selectively withhold from responding when alcohol-related pictures are presented. According to pre-clinical and cross-sectional clinical studies, Alc-IT targets crucial neuronal processes, and may have effects on highly relevant clinical variables including drinking behavior. The ongoing SNF-study tests this training for the first time in a clinical sample.

In the context of treatment studies in general, but also in this special context, three major questions of high scientific relevance arise, which we aim to investigate with the proposed project:

1) **What are the mechanisms of change?** *Identify targets for optimizing the intervention*.

Alc-IT could work either by directly increasing alcohol-specific inhibitory control or via the devaluation of alcohol-related stimuli, achieved through the constant pairing of these stimuli with a stopping response. The first mechanism of change (inhibitory control) suggests that changes in inhibitory capacity mediate the effects of Alc-IT on drinking outcome, while the second mechanism of change (stimulus devaluation) suggests a mediation through a reduction of positive implicit associations towards alcohol. Motivation to change alcohol use may additionally moderate these mediation effects.

2) **What are typical drinking trajectories and what are their predictors**?

Describe and predict change patterns in the year post-intervention.

Person-centered statistics allow to identify empirically derived classes of individual trajectories of drinking behaviour change in the year after the intervention (e.g. stable abstinent, intermittent abstinent, immediate relapse, late relapse, stable controlled drinking, or controlled drinking with lapses). Treatment history, craving, abstinence-related self-efficacy, alcohol-related expectations, AUD severity and individual drinking goals will be investigated as predictors of trajectory class membership.

3) **Who benefits most from the intervention?** *Inform individualized treatment planning.*

Baseline levels of inhibitory control, implicit associations and executive control as well as motivation and age are possible moderators of training effects of Alc-IT. Regression Models will investigate the specificity and relative importance of these factors as moderators of training effects on short-term (3-months follow-up) and long-term (drinking trajectories until 12-months follow-up) outcomes.

The ongoing SNF-study assesses all variables necessary to investigate the above research questions from over 230 patients at seven time points, including 3-, 6-, and 12-months follow-up. Its data set thus provides an excellent opportunity to answer these additional important questions. The proposed project aims to investigate these questions with advanced, up-to-date statistical methods and thus will enhance our knowledge about mechanisms of change, broaden our understanding of factors influencing drinking trajectories, and provide information for differential indication.