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CUE-INDUCED BRAIN ACTIVATION MEDIATES SUBSEQUENT RELAPSE IN ABSTINENT ALCOHOL-DEPENDENT PATIENTS

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Introduction: In alcoholism, one relevant mechanism contributing to relapse is the exposure to stimuli that are associated with alcohol intake. Such conditioned cues can elicit conditioned responses like alcohol craving and consumption. In the last decade, considerable progress has been made in identifying basic neuronal mechanisms that underlie cue-induced alcohol craving.

Objectives/ aims: We explored whether functional brain activation during exposure to alcohol-associated stimuli is related to the prospective relapse risk in detoxified alcohol-dependent patients.

Methods: 46 alcohol-dependent and 46 healthy volunteers participated in a fMRI study using a cue reactivity paradigm, in which visual alcohol-related and control stimuli were presented. Patients were followed for 3 months. Afterwards data was analysed regarding the subsequent relapse, resulting in 16 abstainers and 30 relapsers.

Results: Alcohol-related versus neutral stimuli activated a frontocortical-limbic network including inferior, medial and middle frontal gyrus as well as putamen in the group of patients relative to healthy controls. Moreover, abstainers showed a stronger activation in orbitofrontal cortex as well as midbrain during the presentation of alcohol-related cues whereas relapsers revealed a stronger activation of cingulate gyrus.

Conclusions: This study suggests that cue-induced activation of orbitofrontal cortex and dopaminergic innervated midbrain is negatively associated with the prospective relapse risk in alcohol-dependent patients. This could indicate a more pronounced and conscious processing of alcohol cues which might serve as a warning signal and a behavioural controlling function. In contrast, prospective relapsers showed a stronger activation of cingulate gyrus, a region involved in the attribution of motivational value.

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