

Modulation of craving in alcohol use disorder using real-time fMRI

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One of the most prominent symptoms in addiction disorders is the strong desire to consume a particular substance or to show a certain behaviour (craving). Especially the strong association between craving and the probability of relapse emphasises the importance of craving in the therapeutic process. Neuroimaging studies have shown that craving is associated with increased responses, predominantly in frontal and striatal brain regions.

The aim of the present project was the modification of craving-related neuronal responses in patients with alcohol addiction using neurofeedback (real-time fMRI). Neurofeedback provides the opportunity to influence neuronal responses with the aid of learning processes (operant conditioning) and to cause behavioural changes. Neurofeedback using fMRI is an innovative approach which has been possible only for the last few years, providing a very specific feedback signal. The results indicated decreased brain responses after real-time fMRI sessions in alcohol-relevant brain areas. In addition, the craving was slightly reduced.

In future, real-time fMRI will enable a neurophysiologically based therapy for several psychiatric, psychosomatic and neurologic diseases (including depression, anxiety disorders and chronic pain).