Relapse prevention in addiction – from bench to bedside

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From genes to treatment: The effect of polymorphisms in neurotransmitter systems on addictive behaviour, neural response and relapse

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Introduction   The development and maintenance of an alcohol addiction is a complex interaction between genetic and environmental factors. Genetic effects seem to contribute substantially to the risk of developing an addiction, but also to its course and patients' responses to different treatments. Recent studies identified associations between polymorphisms in the genes of glutamate and μ-opioid receptors and addiction risk. Those receptors are of special interest, because they are targets of therapeutic agents, such as acamprosate and topiramate.

Objectives and aims   Several studies were conducted, in order to further determine the effects of genetic polymorphisms in glutamate and opioid receptor genes on addictive behavior, neural response to alcohol cues and relapse risk.

Methods   Genetic effects were investigated in samples of alcohol-dependent patients using functional imaging techniques, neuropsychological tests and follow-up investigation after standard clinical treatment. Data on clinical parameters, neuronal response to alcohol cues, functional neuronal connectivity and relapse risk were collected and analyzed.

Results   Results demonstrate effects of genetic polymorphisms in glutamate and opioid receptors on neuronal response to alcohol cues in frontal and mesolimbic brain areas, subjective craving and time to first relapse. Current findings will be discussed in the light of existing evidence on the contribution of genetic effects to treatment outcome and patient stratification.

Conclusions   The investigation of genetic risk factors and mechanisms by which they affect addiction related phenotypes seems to be a promising tool to identify molecular treatment targets and predictors for successful treatment strategies.

Disclosure of interest   The authors have not supplied their declaration of competing interest.

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Role of inhibitory processes in relapse prevention treatment

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Alcohol dependence is a chronic disorder with frequent relapses during recovery. Most studies have pointed out that craving is the main process involved in relapse, but recently other factors have been implicated in it, such as attentional bias and impulsivity. Some authors consider that different stages could be involved in the relapse process, and each may be governed by different mechanisms: Attentional bias; motivational response to alcohol cues and inhibitory control.

Motivationally salient cues attract and hold selective attention, and this "attentional bias, (AB)" is related to individual differences in appetitive and aversive motivation. In a recent review, attentional bias has been shown to be significantly present in alcohol-dependent and is associated with craving and risk to a relapse in alcohol consumption.

In alcohol-dependent subjects, alcohol-related cues reach a very high motivational valence (Motivational response, MR), which, in effect, increases craving for alcohol and activates behavioral strategies towards alcohol intake. One method used to assess motivational valence of alcohol is the craving self-assessment. In addition, in recent years, the affective modulation of the startle reflex has been used as an objective measure of craving. It has been shown that subjects with a low baseline startle response when viewing alcohol-associated pictures are at major risk of relapse compared to those with increased reactions.

Once alcohol craving has appeared, the subject will either drink or not, depending on his ability to resist his behavior towards alcohol consumption (impulsivity or inhibitory control, IC). Moreover, subjects that exhibit greater impulsivity are those more likely to relapse.

Our group has recently conducted a study on a sample of 172 alcohol-dependent patients seen in outpatient therapeutic program during 12 weeks. All of them were assessed with the following measures: Attentional bias was assessed using the dot task, motivational response was evaluated using the affective modulation of the startle reflex paradigm, inhibitory control was assessed by the stop-signal reaction time task. Alcohol relapse variables were: relapse, days to the first relapse and days of accumulated abstinence.

One of the most relevant results was that processes related to inhibitory control (Stop-signal reaction time and attentional bias) were the most relevant measures to explain variables related to relapse in alcohol consumption during the treatment period.

Our results support the use of assessment strategies, therapeutic and pharmacological inhibtoria aimed at improving the ability of serious alcohol-dependent patients.

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Self-related processes and underlying brain networks: Relevance for major psychiatric disorders

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Self-related networks and negative symptoms in psychotic disorders

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Objective   Two factors of negative symptoms in schizophrenia have been consistently described based on factor analysis, "expressive deficits" and "social amotivation". We aimed to investigate the putatively differential involvement of self-related networks, as measured with BOLD fMRI during a self-evaluation task, in two dimensions of negative symptoms in schizophrenia (reduced expression and social amotivation).

Method   Forty-five patients with a diagnosis of schizophrenia participated in an fMRI study in which they performed a