S15.05
VIRTUAL REALITY BASED ASSESSMENT AND THERAPY FOR NEUROPSYCHOLOGICAL DEFICITS

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Information Technologies (IT) have a still growing and highly significant impact on society, human behavior and self representation concepts. Within the IT field, especially immersive projection technologies (IPT) as a special form of Virtual Reality techniques (VR) is expected to accelerate, leading to new possibilities for human experience, interaction and communication, not limited by physical reality. The integration of IPT with standard mental health methodologies will allow for the development of new assessment and treatment applications. Especially the potential of studying human neuropsychological processes with degrees of reliability and validity never seen before is one of the major advantages of these technologies, hopefully leading to a much better understanding of neuropsychological impairments as well as to new and promising training and treatment approaches.

S16. Is drug craving a still valid and evidence-based clinical construct in addiction?

Chairs: J. Ades (F), S. De Risio (I)

S16.01
NEUROBIOLOGICAL BASIS OF CRAVING AND PLEASURE EXPERIENCE: ONE OR MORE REWARD SYSTEMS?

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Craving is the uncontrollable desire for alcohol or any other drug of abuse. This multi-dimensional phenomenon is most readily measured via language-based descriptions following e.g., the presentation of cognitive stimuli, or by inducing certain mood states. It is difficult to measure craving in laboratory animals, and in each model only aspects of craving might be described. Most animal models measure the behavioural responses rather than internal states and are, therefore, better models for relapse rather than craving *per se*. However, some of the available animal models can serve as powerful tools for designing human craving studies.

In our model described in this presentation several months of alcohol availability are followed by a period of alcohol deprivation (i.e., a withdrawal phase). When alcohol is subsequently made available the animals increase their alcohol consumption and preference for alcohol. These animals clearly demonstrate a preference for alcohol over water and exhibit changes in their alcohol intake pattern. This alcohol deprivation effect leads to alcohol consumption of highly concentrated alcohol solutions, even at inappropriate times during the inactive light phase when drinking activity is usually low. These data show that there is a high motivation to drink alcohol following a period of deprivation. Animals will continue to work for alcohol significantly longer than they would before the alcohol deprivation.

Anti-craving substances have been registered for relapse prophylaxis in weaned alcoholics in various European countries (acamprosate) and the United States (naltrexone). Acamprosate and naltrexone most likely reduce ethanol abuse through different neuronal mechanisms. Acamprosate, the Ca-salt of N-acetyl-homotaurinate interacts with NMDA-receptor-mediated glutamatergic transmission in various brain regions. The opiate antagonist naltrexone most likely interfers primarily with the mesolimbic/mesotelencephalic dopaminergic brain-reinforcement systems. This structure *(extended amygdala)* involves the shell of the nucleus accumbens, the bed nucleus of the stria terminalis and the central nucleus of the amygdala.

All addictive drugs share the fact that they can act as a discriminative stimulus and induce positive reinforcement. The self-administration of drugs is prompted primarily by an increase in extracellular dopamine in the nucleus accumbens, a mechanism important for the initiation and the maintenance of drug-seeking. However, there is no doubt that more than a single receptor system is involved in these processes. Repeated and prolonged application of drugs of abuse changes the molecular mechanisms involved in signal transduction. Most principal components of the brain reward system receive glutamatergic input from heterogeneous structures, such as the medial prefrontal cortex, and are influenced by local GABAergic interneuronal activity. Functional imaging techniques in humans demonstrate that craving for alcohol, as well as other drugs of abuse, involves areas predicted from animal experiments. The various molecular targets responsible for the habit-forming action of drugs of abuse in humans and in experimental animals are presently detailed.

S16.02
CRAVING FOR OPIATES

M. Gossop

No abstract was available at the time of printing.

S16.03
CRAVING FOR ALCOHOL

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In the long-term process of alcohol dependence intoxication and withdrawal states are common events. Different vulnerability factors of alcohol dependent patients (biological as well as psychological ones) influence significantly the clinical picture. The time of intervention (early versus late) influences the symptoms to be diagnosed as well as the therapeutic strategy. In early stages socio-psychological factors and different basic disturbances influence drinking behaviour and craving. In late stages alcohol related disabilities and withdrawal states influence different mechanism of craving.

The classification of alcohol dependence according to ICD-10 and DSM-IV is not useful to develop different relapse prevention strategies. Different mechanism are leading to different types of craving. Emotional states and key-conditions are of increasing interest.

In an 18 year prospective follow up study we could show that only 9% of alcohol dependent patients are truly sober. One of the main causes of relapse has been alcohol seeking behaviour (craving). This therapeutic outcome shows clearly that we have to improve our therapeutic strategies. During recent years different pharmaceutical agents have been investigated, and some of these improved the therapeutic outcome. In the light of our results, we propose to distinguish between 5 different forms of craving leading to relapse. This drug seeking behaviour reflects mainly 4 different transmitter systems (dopamine, serotonine, endorphine

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