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TOBACCO DEPENDENCE: THE NEURAL BASIS OF THE EFFECTS ON THE REWARD SYSTEM

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Tobacco dependence is one of the most common preventable risk factors for health damage. The consequences of this addiction are not only shown on various organ systems, but also lead to changes on neuronal level.

The aim of the investigation was to detect neural responses in the reward system in smokers versus nonsmokers. For that purpose, the processing of reward – associated stimuli under withdrawal is compared to the neural activity after nicotine – consumption.

40 volunteers (20 smokers, 20 nonsmokers), between 18 and 60 years, were enrolled in the study. The smokers were further devided into two groups. One group was first measured in deprivation, secondly after smoking, the second group in inverse order. After a resting sequence in a 3T MRI, the participants took part in a gambling paradigm with real financial profit and loss.

The preliminary results show differences in reward-related neural structures like amygdala, hippocampus between smokers and nonsmokers. In addition, differences were found among smokers depending on the current smoking status (withdrawal or tobacco consumption).

Reward related structures are differentially activated, depending on active consumption versus withdrawal. Thus these data furthermore point out the importance of smoking status in neurobiological and treatment studies.

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