MedicalXpress

# Structural and functional abnormalities found in brains of relapsed alcohol-dependent patients

September 20 2012

Scientists at Charité – Universitätsmedizin Berlin have succeeded in coming closer to determining the risk of relapse in detoxified alcohol-dependent patients. Using an imaging process (magnetic resonance tomography) it was shown that particular regions in the brain demonstrate structural as well as functional abnormalities in relapsed alcohol-dependent patients. Study findings are published in the journal *Archives of General Psychiatry*.

In the study conducted under the direction of Prof. Andreas Heinz, director of the Charité Department of Psychiatry and Psychotherapy, scientists examined a group of 46 detoxified alcohol-dependent patients, in addition to a large control group. Structural imaging showed anatomical properties of brain substance, and the examination of functional signals in the brain were measured in reaction to alcohol-associated stimuli. After three months, patients were reexamined for eventual relapses; 30 study participants relapsed and 16 continued to be abstinent.

It was proven that relapse patients had increased loss of grey matter in particular regions of the forebrain. This section of the brain is known to be associated primarily with behavioral regulation and emotional control. Furthermore, measurement of functional brain responses in reaction to alcohol-associated stimuli showed that different brain regions were activated in relapsed patients than in patients who remained abstinent.

These measurements show that sections of the brain in relapse patients were active that are associated primarily with directing attention to certain stimuli. In contrast, the abstinent patients demonstrated an activation of brain areas that are (among other functions) associated with processing of stimuli inducing aversion (aversive stimuli) or that are particularly important (salient stimuli).

"This characteristic in patients who remained abstinent possibly acts as a warning signal and prevents potential relapse when confronted with alcohol," said Anne Beck, primary author of the study. Future studies could examine these aspects in greater depth and take eventual factors of alcohol dependency into consideration, like for example, genetic mechanisms. Thus people with a particularly high risk of relapse could be identified and systematically supported with therapy.

**More information:** Beck A, Wüstenberg T, Genauck A, Wrase J, Schlagenhauf F, Smolka MN, Mann K, Heinz A. Effect of brain structure, brain function, and brain connectivity on relapse in alcohol-dependent patients. *Arch Gen Psychiatry*. doi:10.1001/archgenpsychiatry.2011.2026

Provided by Charité - Universitätsmedizin Berlin