

Smoking interferes with recovery from alcohol-related brain damage

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Alcohol-use disorders (AUDs) can damage the brain, particularly the frontal and parietal cortices, although this damage is at least partially reversible with sustained abstinence from alcohol. Chronic smoking is extremely common among individuals with AUDs. A new study has used longitudinal magnetic resonance imaging (MRI) of brain blood flow to show that smoking makes it harder for brain blood flow to recover from long-term heavy drinking.

Results will be published in the August issue of *Alcoholism: Clinical & Experimental Research* and are currently available at Early View.

"The brain's frontal lobes are involved in higher-order cognitive function, such as learning, short-term memory, reasoning, planning, problem solving, and emotional control," explained Anderson Mon, senior research fellow in the department of radiology at the University of California, San Francisco and corresponding author for the study. "The parietal lobes are involved in aspects of attentional regulation and visuospatial processing. Chronic and excessive drinking is associated with neurobiological abnormalities in these regions, which contribute to the cognitive dysfunction frequently observed in those with AUDs after detoxification."

Cerebral perfusion is a measure of the amount of [blood flow](#) to brain tissue per unit time. A normal, uninterrupted flow of blood through the brain is necessary to supply brain tissue with sufficient essential compounds and oxygen for normal metabolism, and will also carry away

metabolic byproducts. The brain is only about 1/50th of total body weight, but it demands about 20 percent of the heart's oxygen-rich blood.

"In general, AUDs are associated with reduced perfusion," said Mon. "With abstinence from [alcohol](#), brain perfusion abnormalities may recover, but there are several factors that may influence recovery, such as age, diet, exercise, genetic predispositions and - the topic of our research - other substances such as tobacco products."

Mon and his colleagues measured brain perfusion in the frontal and parietal cortices of three groups of study participants: 19 non-smoking alcohol-dependent (ALC) patients, and 22 [smoking](#) ALC patients at one and five weeks of abstinence from alcohol; as well as 28 age-matched non-smoking, light-drinking controls.

Results showed that even though cerebral perfusion among the ALC individuals, as a whole, improved with abstinence from alcohol, those ALC who were chronic smokers demonstrated significantly less perfusion recovery, particularly in the frontal lobes.

"At one week of abstinence, both smoking and non-smoking ALC patients had similar frontal and parietal gray matter perfusion; and both groups had lower perfusion than normal controls," said Mon. "However, after five weeks of abstinence, frontal and parietal gray matter perfusion of the non-smoking ALC patients recovered to normal control levels, whereas the smoking ALC group essentially showed no recovery."

Mon added that these findings are consistent with their earlier neuroimaging studies which found chronic smoking in ALC patients was associated with significantly diminished recovery of markers of neuronal, or nerve cell, and cell membrane integrity in multiple brain regions over the same period as this present study.

"These results suggest that patients who want to stop drinking should be offered an option to stop smoking," said Graeme Mason, associate professor of diagnostic radiology and psychiatry at Yale University. "However, any combined cessation has to be designed carefully."

Study results have been mixed, Mason noted. "One study showed that when patients choose to stop smoking and drinking together, they maintain sobriety longer," he said. "Conversely, another study showed the patients who were required to stop smoking at the same time as they stopped drinking did not stay sober as long as those who were not forced." Free will appears to be an important option, he emphasized.

"Additionally," said Mason, "patients may differ in their abilities to handle abstinence from multiple substances at the same time that they may be dealing with other major events in life, but more successful brain recovery may help make those difficult situations easier to manage appropriately. The work of Mons and colleagues certainly suggests that if a patient wishes to tackle both smoking and drinking at the same time, it will be worth the attempt to that person, helping them recover more complete brain function and stay sober, in addition to other, better known health benefits of smoking cessation."

"In short," said Mon, "prolonged and excessive alcohol consumption is bad for your [brain](#), but a combination of alcohol with smoking is worse."

Source: Alcoholism: Clinical & Experimental Research

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