Researchers Find Alcoholics Display Abnormal Brain Activity When Processing Facial Expressions

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(PhysOrg.com) -- Researchers from Boston University School of Medicine (BUSM) have found that individuals who have a long history of alcoholism, but who have been abstinent for at least a month up to many years, showed abnormal brain activity when looking at facial expressions of others. The findings, which appear in the current issue of *Alcoholism: Clinical and Experimental Research*, confirms that alcoholics suffer from abnormalities in parts of the brain that control emotional perception and memory.

The emotional changes experienced by a long-term chronic alcoholic cover a broad spectrum. Some of these changes, apathy and emotional flatness are reminiscent of those seen in patients with bilateral frontal lobe damage or in patients with right-hemisphere damage. Other abnormalities are subtle. For example, alcoholics may make atypical judgments regarding the nature of facial emotional expressions, suggesting that alcoholism may involve an underlying neurocognitive deficit in the capacity to comprehend emotional information.

In this study, researchers compared abstinent long-term alcoholics to healthy nonalcoholic controls by using functional magnetic resonance imaging (fMRI) that focused on abnormalities in temporal limbic (amygdala and hippocampus) brain activation to emotionally expressive faces.

Employing both verbal (word) and non-verbal (face) materials in an effort to contrast relative hemispheric sensitivities to the cumulative effects of alcohol abuse, the researchers found abstinent long-term alcoholics showed decreased and abnormal brain activity when looking at facial expressions, in particular in the amygdala and hippocampus areas of the brain.

According to the researchers, the results provide unique neuroimaging evidence of neurophysiological changes in emotional functioning associated with chronic alcoholism.

The findings also concur with clinical reports documenting interpersonal difficulties in this population “Since "reading facial expressions" is an important part of social interaction, alcoholics as well as other previously addicted groups, may be suffering from brain abnormalities in parts of the brain that control emotional perception and memory,” said author Marlene Oscar Berman, PhD, a professor of neurology (Neuropsychology) and psychiatry and Director of BUSM’s Laboratory of Neuropsychology. “Furthermore, these results reveal neural substrates underlying alcoholism-related emotional anomalies and impairments of brain reward circuitry that mediate addictions such as alcoholism,” she added.

Provided by Boston University