Adolescent drinking is associated with cortical thinning, altered neurotransmission in young adults, finds study

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During adolescence, the brain undergoes intense development and is particularly susceptible to the deleterious effects of alcohol use.

According to findings from a recent follow-up study in Finland, young adults whose heavy drinking began in adolescence have lower cortical gray matter thickness and altered neurotransmission. The findings were published in *Alcohol: Clinical and Experimental Research*.

Previous research has shown that repeated binge drinking in adolescence is associated with changes in the central nervous system in adulthood, including lower gray matter volume and greater inhibitory neurotransmission. The present study is the first to explore the association between gray matter thickness and neurotransmission.

The study included 26 young adults who had a history of heavy drinking, as well as 21 controls who consumed little or no alcohol at all. The study participants were followed for 10 years, from the age of 13–18 until around the age of 25. Changes in gray matter volume were measured from magnetic resonance images of the brain, and cortical activity was measured using simultaneous transcranial magnetic stimulation and electroencephalography (TMS-EEG).

In adolescents with a history of heavy drinking, the researchers observed lower mean gray matter thickness in several regions of the brain, as well as a greater mean N45 potential, when compared to adolescents who consumed little or no alcohol at all. The N45 potential is reflective of the activity of the inhibitory GABA and the excitatory glutamate neurotransmitter systems. In the heavy-drinking group, lower gray matter thickness was associated with an increased N45 potential, especially in the frontal and parietal lobes.

According to the researchers, the results indicate that the thinning of the cerebral cortex observed in young adults with a history of heavy drinking since adolescence is associated with altered neurotransmission, especially in the frontal and parietal lobes. However, further research is needed to assess the mechanisms underlying these findings.

More information: Anna Juntunen et al, Cortical thickness is inversely associated with transcranial magnetic stimulation-evoked N45 potential among young adults whose heavy drinking began in adolescence, *Alcohol: Clinical and Experimental Research* (2023). DOI: 10.1111/acer.15119