

SUMMARY

REPORT 11 OF THE COUNCIL ON SCIENTIFIC AFFAIRS (A-03) Effects of Alcohol on the Brains of Underage Drinkers

Objective: Adolescence and college attendance are high-risk periods for initiating alcohol use and engaging in patterns of binge drinking. This report examines the physiological and medical consequences of drinking by young people, particularly with respect to neurotoxic and harmful cognitive effects.

Methods: Literature searches were conducted in the MEDLINE database for English-language articles published from January 1990 through February 2003, using the search terms “adolescent,” “youth,” and “young adult” qualified by “alcohol dependence,” “ethanol,” and “binge drinking.” The results of this search were further qualified using the search terms “cognition,” “brain,” “health,” and “injury,” yielding a total of 1,371 articles. Articles containing information relevant to the consequences of alcohol consumption on the health of adolescents were examined further. Additional references were culled from the bibliographies of these pertinent references. Statistics on underage drinking were gathered from the articles described above and from various government publications.

Results: Underage drinking is common and affects virtually every community in the United States. The age at which young people begin using alcohol has decreased over the last 35 years; on average, youths now take their first drink at the age of 12 years. Problematic alcohol consumption is not a benign condition that resolves with age. Individuals who first use alcohol in the age range of 11 to 14 years are at much greater risk of subsequently developing alcohol use disorders. Underage drinkers are susceptible to several immediate consequences of alcohol use, including blackouts, hangovers, and alcohol poisoning. They also may be at elevated risk for experiencing neurodegeneration (particularly in regions of the brain responsible for learning and memory), impairments in functional brain activity, and the appearance of neurocognitive deficits. Additionally, underage drinking, the occurrence of drinking episodes, and a pattern of binge drinking directly impair study habits and erode the development of transitional skills needed for progression to adulthood.

Conclusions. Underage alcohol use is associated with brain damage and neurocognitive deficits. The harmful consequences of underage drinking have implications for the learning abilities and intellectual development of underage drinkers. Impaired intellectual development may continue to affect individuals even after they have entered adulthood. Emerging data on the susceptibility of the adolescent brain to the harmful effects of alcohol create an imperative for policy-makers and organized medicine to address the problem of underage drinking through renewed initiatives.