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Environment key early: Genes' role expands in alcohol dependence

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The influence of genetics increases as young women transition from taking their first drink to becoming alcoholics. A team of researchers at Washington University School of Medicine in St. Louis found that although environment is most influential in determining when girls begin to drink, genes play a larger role if they advance to problem drinking and alcohol dependence.

The researchers studied 3,546 female twins ages 18 to 29 to ferret out the influences of genes and environment in the development of alcohol dependence. Their findings appear in the April issue of *Alcoholism: Clinical & Experimental Research*.

The road to alcohol dependence involves transitions through many stages of drinking behaviors: from the first drink to the first alcohol-related problems (such as drinking and driving, difficulty at school or work related to alcohol use) to alcohol dependence.

Environmental factors the twins shared, such as exposure to conflict between parents or alcohol use among peers in school, exerted the largest influence on initiation of alcohol use. The study found that females who had their first drink at an earlier age were more likely to develop serious alcohol problems. The researchers found that all transitions were attributable in part to genetic factors, increasing from 30 percent for the timing of first drink to 47 percent for the speed at which women progressed from problem drinking to alcohol dependence. But genetics did not explain everything.

"Even when genetic factors are most influential, they account for less than half of the influence on drinking behavior," says lead author Carolyn E. Sartor, Ph.D., a postdoctoral research fellow at the School of Medicine. "That's good news in terms of modifying these behaviors and reducing the risk of developing alcohol dependence. Genetics are not destiny, and our findings suggest that there are opportunities to intervene at all stages of alcohol use."

Sartor's team collected alcohol-use histories from telephone interviews to determine when these women made transitions from one drinking milestone to the next. They studied twins to get an idea of the genetic influences on those transitions. Identical twins share 100 percent of their genetic material, and fraternal twins share about half. So when identical twin pairs are found to be more similar on a given behavior than fraternal twin pairs, this suggests that genetics are playing a role in that behavior. The researchers used this twin-based design to estimate the contributions of genes-versus-environment to the rate at which women progressed through stages of alcohol use.

"Alcohol dependence is a psychiatric disorder, but drinking alcohol in moderation is normative and is a part of many cultural traditions," Sartor explains. "For example, 85 percent of women in our study reported having at least one drink in their lifetimes whereas only about 7 percent became alcohol dependent."

Past studies have focused more on men than women, but Sartor says it is important to study both sexes because risk factors that contribute to alcohol problems differ somewhat between males and females. She also says this study helps to dispel the myth that alcohol dependence is a disorder exclusive to middle-aged men. In the United States, the prevalence of alcohol use disorders is highest among 18- to 29-year-olds.

"Much of the heavy drinking that occurs in the young adult years is

actually problem drinking," she explains. "What once was perceived as partying a little too much is now being recognized as a potentially serious problem."

The majority of the young women in the study curtailed their drinking before it advanced from a normal behavior to a psychiatric disorder.

The researchers plan to extend their investigations to examine genetics and environment on other drinking behaviors, such as the cessation of alcohol use. Many problem drinkers in their 20s, for example, "mature out" of alcohol-related problems, she says. These changes coincide with major lifestyle changes including engagement in serious relationships, commitments to career and the arrival of children, all of which involve significant changes in the environment. Sartor and her colleagues also are planning to study the timing of transitions in the development of other substance-use problems.

Source: Washington University