Scientists Find Gene Link to Teenage Binge Drinking

Scientists have unpicked the brain processes involved in teenage alcohol abuse and say their findings help explain why some young people have more of a tendency to binge drink.

A study published in the Proceedings of National Academy of Sciences (PNAS) journal found that a gene known as RASGRF-2 plays a crucial role in controlling how alcohol stimulates the brain to release dopamine, triggering feelings of reward.

"If people have a genetic variation of the RASGRF-2 gene, alcohol gives them a stronger sense of reward, making them more likely to be heavy drinkers," said Gunter Schumann, who led the study at King's College London's Institute of Psychiatry.

Alcohol and other addictive drugs activate the brain's dopamine systems, which induces feelings of pleasure and reward.

Worldwide, some 2.5 million people die each year from the harmful use of alcohol, accounting for about 3.8 percent of all deaths, according to the World Health Organization.

Recent studies also have found that RASGRF-2 is a risk gene for alcohol abuse, but until now the mechanism involved in the process was not clear.

For this study, scientists initially looked at mice who had been modified to have the RASGRF2 gene removed, to see how they reacted to alcohol. They found the lack of RASGRF-2 was linked to a significant reduction in alcohol-seeking activity. They also discovered that when the mice did consume alcohol, the absence of RASGRF-2 reduced the activity of dopamine-releasing neurons in a region of the brain called the ventral tegmental area (VTA) - preventing the brain from releasing dopamine and limiting any sense of reward.

The team then analyzed brain scans of 663 14-year old boys and found that when they were anticipating a reward in a mental test, those with genetic variations to the RASGRF2 gene had more activity in an area of the brain closely linked to the VTA and also involved in dopamine

release.

This suggests people with a genetic variation on the RASGRF-2 gene release more dopamine when anticipating a reward, and hence derive more pleasure from it, the scientists said.

To confirm the findings, the team analyzed drinking behavior from the same group of boys two years later when many of them had already begun drinking frequently. They found that those with the RASGRF-2 gene variation drank more often at the age of 16 than those without it.

Experts writing in *The Lancet* journal in February said up to 210,000 people in England and Wales will be killed prematurely by alcohol in the next 20 years, with a third of those preventable deaths due to liver disease alone.

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