Dad's alcohol consumption could influence sons' drinking, study finds

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Credit: Kevin Casper/public domain

Even before conception, a son's vulnerability for alcohol use disorders could be shaped by a father who chronically drinks to excess, according to a new animal study from the University of Pittsburgh School of Medicine. The findings, published online Wednesday in *PLOS ONE*, show male mice that were chronically exposed to alcohol before

breeding had male offspring that were less likely to consume alcohol and were more sensitive to its effects, providing new insight into inheritance and development of drinking behaviors.

Previous human studies indicate that alcoholism can run in families, particularly father to son, but to date only a few gene variants have been associated with Alcohol Use Disorder and they account for only a small fraction of the risk of inheriting the problem, said senior investigator Gregg E. Homanics, Ph.D., professor of anesthesiology and pharmacology & chemical biology, Pitt School of Medicine.

"We examined whether a father's exposure to alcohol could alter expression of the genes he passed down to his children," Dr. Homanics said. "Rather than mutation of the genetic sequence, environmental factors might lead to changes that modify the activity of a gene, which is called epigenetics. Our mouse study shows that it is possible for alcohol to modify the dad's otherwise normal genes and influence consumption in his sons, but surprisingly not his daughters."

In the study, he and lead author Andrey Finegersh, M.D./Ph.D. student in the Department of Pharmacology & Chemical Biology graduate program, chronically exposed male mice over five weeks to intermittent ethanol vapor, leading to blood alcohol levels slightly higher than the legal limit for human drivers. Then, they mated them to females who had not been exposed to alcohol.

Compared to those of ethanol-free sires, adult male offspring of ethanol-exposed mice consumed less alcohol when it was made available and were less likely to choose to drink it over water. Also, they were more susceptible to alcohol effects on motor control and reduction of anxiety.

"We suspected that the offspring of alcohol exposed sires would have an enhanced taste for alcohol, which seems to be the pattern for humans,"

Mr. Finegersh said. "Whether the unexpected reduction in alcohol drinking that was observed is due to differences between species or the specific drinking model that was tested is unclear."

The researchers plan to examine other drinking models such as binge drinking, identify how alcohol modifies the genes, and explore why female offspring appear unaffected.

Provided by University of Pittsburgh Schools of the Health Sciences

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