

Pattern of alcohol intake more accurate indicator of liver disease risk than overall consumption, finds study

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Those who binge drink and have a certain genetic makeup are six times more likely to develop alcohol-related cirrhosis, according to new research from UCL, the Royal Free Hospital, the University of Oxford and the University of Cambridge.

The study, published in *Nature Communications*, is the first to assess how an individual's pattern of drinking, their genetic profile (via a [polygenic risk score](#)) and whether or not they have type-2 diabetes affects their risk of developing alcohol-related cirrhosis (ARC).

The observation that pattern of drinking is more important than volume, coupled with the increased risk when [genetic makeup](#) and type-2 diabetes are also present, provides more [accurate information](#) with which to identify those most vulnerable to liver disease.

Liver disease is one of the major causes of premature death globally, with 2-3% of the world's population having cirrhosis (scarring of the liver) or liver disease. Since the COVID-19 pandemic began, alcohol-related deaths have risen by 20%.

In this study, researchers analyzed data from 312,599 actively drinking adults in the UK Biobank cohort, to assess the impact of pattern of drinking, [genetic predisposition](#) and [type-2 diabetes](#) on the likelihood of developing ARC.

A baseline hazard ratio (HR) of one was set using data from participants who reported drinking within daily limits, had low genetic predisposition to ARC and were free of diabetes.

Those who engaged in heavy binge drinking, which is categorized as having 12 units in a day at some point during a week, were three times as likely to develop ARC. The risk for those with a high genetic predisposition was four times higher and the risk for type-2 diabetics

was two times higher.

Dr. Linda Ng Fat, a first author of the study from UCL Epidemiology & Public Health, said, "Many studies that look into the relationship between liver disease and alcohol focus on the volume of alcohol consumed. We took a different approach by focusing on the pattern of drinking and found that this was a better indicator of liver disease risk than volume alone. The other key finding was that the more risk factors involved, the higher the 'excess risk' due to the interaction of these factors."

When heavy binge drinking and high genetic predisposition were at play, the risk of developing ARC was six times higher than the baseline risk. The addition of type 2 diabetes as well resulted in an even greater risk.

Dr. Gautam Mehta, a senior author of the study from UCL Division of Medicine and the Royal Free Hospital, said, "Only one in three people who drink at high levels go on to develop serious liver disease. While genetics plays a part, this research highlights that pattern of drinking is also a key factor. Our results suggest, for example, that it would be more damaging to drink 21 units over a couple of sessions rather than spread evenly over a week. Adding genetic information, which may be widely used in health care over the coming years, allows an even more accurate prediction of risk."

Though polygenic risk scores are not in widespread clinical use at the moment, they are likely to become more commonly used as a method of defining personalized [disease](#) risk.

Dr. Steven Bell, a senior author of the study from the University of Cambridge, said, "As [liver disease](#), particularly alcohol-related fatalities, has seen a significant surge since the onset of the COVID-19 pandemic, it is imperative that we adopt innovative strategies to address this

escalating crisis. This study equips us with novel tools that are essential in pinpointing individuals at highest risk, thereby enabling us to direct interventions more effectively towards those who stand to benefit the most."

Pamela Healy, Chief Executive of the British Liver Trust said, "This research is important because it reveals that it's not just how much you drink overall but the way that you drink matters. Drinking a lot, quickly, or drinking to get drunk can have serious consequences for your [liver](#) health. Over the last twenty years, as alcohol has become more accessible and affordable, there has been a disconcerting shift in the UK's drinking culture. The UK needs to tackle increased alcohol consumption through a joined up 'alcohol strategy' that includes taxation, stronger controls on alcohol advertising and marketing and improved awareness of the dangers of binge drinking."

More information: Binge-Pattern Alcohol Consumption and Genetic Risk as Determinants of Alcohol-Related Liver Disease, *Nature Communications* (2023). [DOI: 10.1038/s41467-023-43064-x](https://doi.org/10.1038/s41467-023-43064-x)

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