Population health study: Alcohol consumption increases the risks of over 60 diseases

June 9 2023

Credit: AI-generated image (disclaimer)

Alcohol consumption increases the risks of over 60 diseases in Chinese men, including many diseases not previously linked to alcohol, according to a new study by researchers from Oxford Population Health and Peking University, published in *Nature Medicine*.

Alcohol consumption is estimated to be responsible for about 3 million deaths worldwide each year, and it is increasing in many low- and middle-income countries such as China. The harmful effects of heavy drinking for certain diseases (such as liver cirrhosis, stroke and several types of cancer) are well known, but very few studies have systematically assessed the impact of alcohol use on an extensive range of diseases within the same population.

The study shows that alcohol use increases the risks of 61 diseases in men in China, including many non-fatal diseases not known to be alcohol-related due to limited previous evidence. The findings of this study demonstrate the influence that alcohol intake may have on risk of disease in populations around the world.

The researchers used data from the China Kadoorie Biobank (CKB), a collaborative study of over 512,000 adults recruited during 2004-08 from ten diverse urban and rural areas across China. Study participants were interviewed about their lifestyle and behaviors, including detailed alcohol drinking patterns.

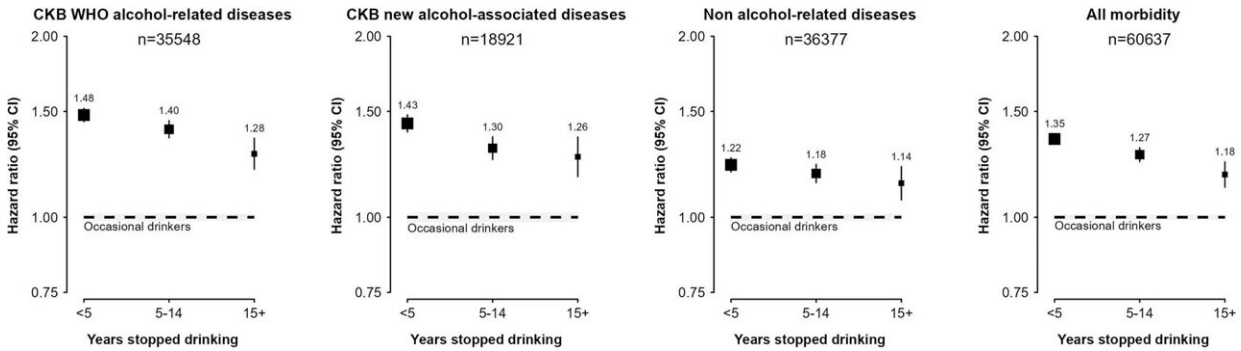
About a third of men, but only 2% of women, drank alcohol regularly (i.e., at least once a week). The researchers comprehensively assessed the health effects of alcohol use on over 200 different diseases in men identified through linkage to hospital records over a period of about 12 years. Importantly, they also undertook a genetic analysis to clarify whether or not alcohol intake was responsible for causing disease.

Key findings:

- Among 207 diseases studied, self-reported alcohol intake was associated with higher risks of 61 diseases in men. This included 28 diseases previously established by the World Health Organization as alcohol-related, such as liver cirrhosis, stroke,

and several gastrointestinal cancers, and 33 diseases not previously established as alcohol-related, such as gout, cataract, some fractures, and gastric ulcer;

- There were over 1.1 million hospitalizations recorded in the study, and men who had ever drank alcohol regularly had significantly higher risk of developing any disease and experienced more frequent stays in hospital, compared with men who had only drunk alcohol occasionally;
- Certain drinking patterns, such as drinking daily, drinking in heavy "binge" episodes, or drinking outside mealtimes, particularly increased the risks of certain diseases, particularly liver cirrhosis;
- In the genetic analyses, there was evidence for a dose-dependent causal effect on the identified alcohol-related diseases collectively, with every four drinks per day associated with a 14% higher risk of established alcohol-related diseases, 6% higher risk of diseases not previously known to be alcohol-related, and over two-fold higher risk of liver cirrhosis and gout;
- In the genetic analyses, higher alcohol intake was significantly associated with higher risk of stroke in a dose-response manner (consistent with previous findings in the CKB study), but showed no increased risk with ischemic heart disease (IHD). Moreover, moderate drinking (ie one-two drinks/day) did not have any protective effects against IHD;
- As few women in China drink alcohol (less than 2% of women in the study drank regularly), women in this study provided a useful control group in the genetic analyses, which helped confirm that the excess disease risks in men were caused by drinking alcohol, not by some other mechanisms related to the genetic variants.



Adjusted HRs for different aggregated and all-cause morbidities associated with years after stopping drinking, in men. Cox models comparing ex-drinker groups with occasional drinkers were stratified by age-at-risk and study area and were adjusted for education and smoking. Each box represents HR with the area inversely proportional to the variance of the group-specific log hazard within subplot. The vertical lines indicate group-specific 95% CIs for various ex-drinker groups. The shaded strip indicate the group-specific 95% CIs for occasional drinkers. The numbers above the error bars are point estimates for HRs. CI, confidence interval; HR hazard ratio; CKB, China Kadoorie Biobank; WHO, World Health Organization. Credit: *Nature Medicine* (2023). DOI: 10.1038/s41591-023-02383-8

Pek Kei Im, a Research Fellow at Oxford Population Health and a lead author of the paper, said, "Alcohol consumption is adversely related to a much wider range of diseases than has previously been established, and our findings show these associations are likely to be causal."

Professor Liming Li, a senior author and CKB co-PI from Peking University, said, "Levels of alcohol consumption are rising in China, particularly among men. This large collaborative study demonstrates a need to strengthen alcohol control policies in China."

Iona Millwood, Associate Professor at Oxford Population Health and a

senior author of the study, said, "It is becoming clear that the harmful use of alcohol is one of the most important risk factors for poor health, both in China and globally."

Professor Zhengming Chen, Richard Peto Professor of Epidemiology at Oxford Population Health and a senior author and CKB co-PI, said, "This study provides important causal evidence of the scale of alcohol-related harms, which is critical to inform prevention strategies in different countries."

In East Asian populations, there are common genetic variants that greatly reduce alcohol tolerability, because they cause an extremely unpleasant flushing reaction after drinking alcohol. People with these genetic variants tend to drink less alcohol and because these genetic variants are unrelated to other lifestyle factors (such as smoking or socioeconomic status), the researchers can use this information to more accurately assess the cause-and-effect relationships of alcohol with a wide range of diseases.

The paper, "Alcohol consumption and risks of more than 200 diseases in Chinese men," can be read in *Nature Medicine*.

More information: Pek Kei Im et al, Alcohol consumption and risks of more than 200 diseases in Chinese men, *Nature Medicine* (2023). DOI: 10.1038/s41591-023-02383-8

Provided by University of Oxford