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The Heightened Risk of Fatty Liver Disorders in the Time of COVID-19

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Coronavirus disease 2019 (COVID-19) has come to the United States just as we are in the throes of an epidemic of fatty liver diseases. The fragile balance between healthy and unhealthy consumption has been upended, leading to growing fears that obesity and excessive consumption of alcohol will replace COVID-19 as the next major public health crisis.

The pre-COVID-19 reasons for the growth in obesity and metabolic syndrome on the one hand and alcohol use disorder (AUD) on the other are complex, but the trends are unequivocal. Median body mass index (BMI) and the prevalence of diabetes mellitus, both markers for non-alcohol-related fatty liver disorders, have been increasing for the past 30 years.¹ There is also an undeniable link between socioeconomic status and the risk of obesity.² One study from the University of Michigan Health System demonstrated that for every 1% increase in prevalence of persons with low-income status, there was a 1.17% increase in rates of overweight and obese students within their population.³ Data taken from the National Epidemiological Survey on Alcohol and Related Conditions showed that between 2001-2002 and 2012-2013, harmful levels of drinking have been on the rise. Furthermore, the growth in high-risk drinking and AUD was seen in women, older adults, racial and ethnic minorities, and individuals with lower income or educational levels.⁴ Tapper and Parikh have shown that the greatest increases in alcohol-associated liver deaths between 2009 and 2016 occurred in drinkers in the age range of 25-34 years.⁵

The arrival of COVID-19 is likely to exacerbate, albeit indirectly, the prevalence of fatty liver diseases. One reason is the age-old tendency to eat and drink more when facing adversity. But more than that, we need

to consider how chronic stress and deteriorating psychosocial health are the consequence of quarantine without a predictable end. When combined with financial hardship from loss of income in the face of COVID-19, we have created the environment for alcohol- and non-alcohol-related hepatic steatosis. Indeed, while the quarantines and lockdowns persist, alcohol sales both online and in retail stores have continued to spike. One poll administered early in the pandemic to 2,200 adults revealed nearly 1 in 5 individuals was drinking more alcohol than before COVID-19, and this rate was even higher among younger populations.⁶

It was through this prism of COVID-19 that we read the interesting study by Peeraphatdit et al⁷ in the current issue of *Mayo Clinic Proceedings*. They used the Mayo Clinic Biobank to ask the question: How do alcohol consumption, body mass, and fatty liver disorder interact? After removing patients with known hepatic steatosis and those with incomplete data, the authors were left with 18,506 subjects, enrolled from April 9, 2009, through March 31, 2016. In a median follow-up of nearly 6 years, 684 subjects developed fatty liver. From this dataset, they were able to examine the associations between steatosis, BMI, and alcohol use. Their analysis shows that increased BMI and alcohol, particularly with heavy alcohol use, interact in the path to fatty liver, whereas moderate alcohol consumption by persons with normal BMI and overweight is associated with lower mortality.

How should we interpret these data? The apparent protective benefit of low-dose alcohol consumption by persons with normal or moderately elevated BMI is counterintuitive, although there are some prior data to support a protective effect.⁸ Conversely, the thrust of the more recent

world literature has been to discourage alcohol consumption.⁹⁻¹¹ For example, the conclusion of a panel of experts in 2016 was that “the level of consumption (of alcohol) that minimizes health loss is zero.”¹² The present study reiterates the harm caused by a combination of excessive consumption of alcohol and obesity. Given what we know about the heightened risks of eating and drinking to excess in the time of COVID-19, Peeraphatdit et al⁷ have sounded a timely warning and have provided compelling reasons for increased vigilance against a pandemic of fatty liver disorders.

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REFERENCES

- Centers for Disease Control and Prevention. National Diabetes Statistics Report. Available at: <https://www.cdc.gov/diabetes>. Accessed October 1, 2020.
- Clemmensen C, Petersen MB, Sørensen TIA. Will the COVID-19 pandemic worsen the obesity epidemic? *Nat Rev Endocrinol*. 2020;16(9):469-470.
- Rogers R, Eagle TF, Sheetz A, et al. The relationship between childhood obesity, low socioeconomic status, and race/ethnicity: Lessons from Massachusetts. *Child Obes*. 2015;11(6):691-695.
- Grant BF, Chou SP, Saha TD, et al. Prevalence of 12-month alcohol use, high-risk drinking, and DSM-IV alcohol use disorder in the United States, 2001-2002 to 2012-2013: Results From the National Epidemiologic Survey on Alcohol and Related Conditions. *JAMA Psychiatry*. 2017;74(9):911-923.
- Tapper EB, Parikh ND. Mortality due to cirrhosis and liver cancer in the United States, 1999-2016: observational study. *BMJ*. 2018;362:k2817.
- American Heart Association News. COVID-19 pandemic brings new concerns about excessive drinking. July 1, 2020. Available at: <https://www.heart.org/en/news/2020/07/01/covid-19-pandemic-brings-new-concerns-about-excessive-drinking>. Accessed October 1, 2020.
- Peeraphatdit T, Ahn JC, Choi DH, et al. A cohort study examining the interaction of alcohol consumption and obesity in hepatic steatosis and mortality. *Mayo Clin Proc*. 2020;95(12):2612-2620.
- Seitz HK, Mueller S, Hellerbrand C, Liangpunsakul S. Effect of chronic alcohol consumption on the development and progression of non-alcoholic fatty liver disease (NAFLD). *Hepato-biliary Surg Nutr*. 2015;4(3):147-151.
- Abat C, Roussel Y, Chaudet H, Raoult D. Alcohol and the global burden of disease. *Lancet*. 2019;393(19):2390-2391.
- Asrani SK, Devarbhavi H, Eaton J, Kamath PS. Burden of liver diseases in the world. *J Hepatol*. 2019;70(1):151-171.
- Rehm J, Shield KD. Global burden of alcohol use disorders and alcohol liver disease. *Biomedicines*. 2019;7(4):99.
- Griswold M, Gakidou E; GBD 2016 Alcohol Collaborators. Alcohol and the global burden of disease - Authors' reply. *Lancet*. 2019;393(10189):2391-2392.