

# Positive and Negative Effects of Alcohol Intake on Diabetes

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## Editorial

Drinking too much alcohol is one of the major causes of clinical illnesses; liver disease, pancreatic disease and mental disorders. It is also bound to cause difficult problems in the management of diabetes, especially in nutritional therapy.

However, in the 2018 ADA recommendations, moderate alcohol intake is described as having no major detrimental effects on long-term blood glucose control in people with diabetes [1]. The risks associated with alcohol consumption include hypoglycemia (particularly for those using insulin or insulin secretagogue therapies), weight gain, and hyperglycemia (for those consuming excessive amounts). Patients with diabetes can follow the same guidelines as those without diabetes if they choose to drink; the recommendation is no more than one drink a day for women, and no more than two for men (one drink is equal to a 12-oz beer, 5-oz glass of wine or 1.5-oz distilled spirits). Lifestyle therapy is defined as reducing excess body weight through caloric restriction, restricting sodium intake, increasing consumption of fruits and vegetables, increasing activity levels, and avoiding excessive alcohol consumption. Hypertriglyceridemia should be treated with dietary and lifestyle changes, including abstinence from alcohol, but moderate alcohol consumption seems to be tolerated by diabetic patients without hypertriglyceridemia who choose to drink.

Many reports note that moderate consumption of alcohol could decrease the onset of diabetes. Knot et al. reported the results of a meta-analysis of 38 observational studies until 2015, concluding that any reduction in risk among moderate alcohol drinkers was confined to women, who exhibited a decreased risk of type 2 diabetes at <71 g/day and peak reduction of 34% at 31-37 g/day, relative to combined abstainers (current non-drinkers and never-drinkers, i.e., those with no history of drinking) [2]. They also suggested several important factors to consider when interpreting their results: female never-drinkers could be less healthy than their male equivalents; data on average alcohol volume intake over a given time might not capture the effect of episodic drinking behavior; biological pathways might operate differently between men and women, such as the effect of alcohol consumption on insulin sensitivity; and sex-specific differences in the dose-response relationship may be attributable in part to disparities in the characteristics of the studies that were analyzed. These points remain to be addressed by further studies.

In 2017-2018, additional reports from Europe and Asia have appeared. In Europe, Holst et al. analyzed the association between alcohol drinking patterns and diabetes risk in the general population from the data of the Danish Health Examination Survey 2007-2008 [3]. They found that 859 men and 887 women developed diabetes among 28,704 men and 41,847 women during a follow-up period of 4.9 years, and concluded that consumption of alcohol on more than 3 or 4 days

per week was associated with the lowest risk of diabetes, even after taking average weekly alcohol consumption into account. Also, in Asia, the association between alcohol consumption patterns and the frequency of diabetes progression was evaluated. Rob M. van Dam introduced the article of Lim et al. examining an association between alcohol consumption and the prevalence of impaired fasting glucose (IFG) and undiagnosed diabetes in the Korea National Health and Nutrition Examination Survey (KNHANES) [4]. Lim et al. found that a high-risk level of consumption was significantly associated with a higher prevalence of IFG in both men and women and a higher prevalence of diabetes in men, and this association was observed for high-risk drinking even at a frequency of only 2 to 4 times per month. They also suggested that binge drinking may be associated with a higher risk of type 2 diabetes, even in the absence of high average daily consumption [5]. Rob M. van Dam commented on the importance of the higher prevalence of variants in alcohol metabolizing genes in East Asian populations, which can lead to higher circulating concentrations of alcohol and acetaldehyde for the same level of alcohol intake. These alcohol-related products might increase the diabetes risk at a lower level of consumption in East Asian populations.

Continued studies will help researchers to update their meta-analyses. Many questions remain to be solved. The roles of the alcohol-related products, acetaldehyde and peroxides, in the management of diabetes must be evaluated. It is also important to correctly measure the concentrations of alcohol and acetaldehyde in the blood. When alcohol-consuming persons happen to be diabetic, their prognosis, mortality and degree of vascular complications might be more serious compared with teetotal diabetic populations. This is another point for future examination.

Increased fat intake accelerates diabetes, clinically and experimentally [6,7]. When people drink alcohol, they may consume too much fat or different types of fat. Studies that evaluate the relationship between alcohol consumption and the incidence of diabetes should measure fat intake status more extensively.

Further studies are needed to understand the effects of moderate alcohol consumption on diabetes, and the strategy for handling alcohol in diabetes management requires a more specific definition that accounts for patients' individual backgrounds.

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