



Mini Review

Understanding the Prevalence of Chronic Kidney Disease in Alcoholic Patients

Sunnapu Hema Priya¹, Bala Yaswanth Kumar Sunnapu²

¹Department of Clinical Nutrition, Sri Ramachandra Institute of Higher Education and Research (Deemed University), Chennai, Tamil Nadu, India,

²Department of Health Informatics, UM School of Information, University of Michigan (UM), Ann Arbor, Michigan, United States.

***Corresponding author:**

Bala Yaswanth Kumar Sunnapu,
Department of Health Informatics, UM School of Information, University of Michigan (UM), Ann Arbor, Michigan, United States.

balayash@umich.edu

Received: 17 May 2025

Accepted: 13 August 2025

Published: 14 March 2026

DOI

10.25259/JCH_33_2025

Quick Response Code:



ABSTRACT

Chronic kidney disease (CKD) is progressive and can progress to end-stage renal disease requiring dialysis or transplantation. Although the adverse effects of alcohol on the liver, heart, and brain are well established, its impact on kidney health has attracted relatively little attention. This review focuses on the link between alcohol use disorder (AUD) and CKD. It reviews the physiological mechanisms by which chronic alcohol intake may lead to impaired kidney function, including nephrotoxicity, oxidative stress, abnormal fluid and electrolyte homeostasis, and systemic manifestations through comorbidities, including hypertension, diabetes, and liver cirrhosis. The paper also summarizes current epidemiological data, noting inconsistencies that may be explained by demographic, behavioral, and access to healthcare factors. It describes challenges in diagnosing symptoms unique to individuals with AUD, especially laboratory abnormalities that can be falsely interpreted and overlapping symptomatology. Management strategies focus on alcohol cessation and comorbidity control as well as the need for individualized nutritional and pharmacologic approaches. In conclusion, the review highlights major research gaps and urges for more rigorous, longitudinal studies to elucidate the multifaceted association between alcohol consumption and progression of kidney disease.

Keywords: Alcohol use disorder, Chronic kidney disease, Comorbidities, Diagnostic challenges, Epidemiology, Prevalence, Preventive strategies

INTRODUCTION

Chronic kidney disease (CKD) is a condition where the kidneys lose their ability to function over a period of time. If poorly managed, it can then progress to end-stage renal disease, during which time dialysis or a kidney transplant is required. CKD is a significant burden of illness and death globally, affecting approximately 10% of individuals globally.¹ Although it is well established that heavy and long-term alcohol use can damage the liver, heart, and brain, the link to kidney health is often overlooked.^{2,3} The present review investigates the prevalence of CKD in patients with alcohol use disorder (AUD). It examines how damage from alcohol to other organs could be related to deterioration in kidney function. This review was undertaken with the aim of summarizing and integrating data from various clinical and epidemiological studies to identify the chronic effects of alcohol consumption on the kidney.³⁻⁵

PATHOPHYSIOLOGY OF ALCOHOL-INDUCED KIDNEY DAMAGE

Excessive and chronic consumption of alcohol can inflict harm to kidney function in various ways. At the outset, both alcohol (ethanol) and its metabolite, acetaldehyde, are toxic to kidney

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, transform, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

©2026 Published by Scientific Scholar on behalf of Journal of Comprehensive Health

tissues.^{2,3} This might result in tubular dysfunction and also scarring of the kidney's filtering system. Alcohol also alters the regulation of blood flow in the body. Due to increased hypertension, which is one of the leading causes of CKD, alcohol consumption further increases the fundamental risks for its development.⁶ Furthermore, oxidative stress as well as inflammation promoted due to long-term drinking damages the kidney's filtering units, termed as glomeruli, and also the supporting blood vessels.⁷ In addition, alcohol impairs the regulation of fluid and electrolyte balance within the body, along with these and most importantly affects the antidiuretic hormone.⁸ As alcohol damages various other organs such as the liver and heart, this creates a domino effect, making renal-related complications much worse.⁹⁻¹¹ In this part, we elaborate on these interrelated mechanisms, considering laboratory as well as practical clinical investigations.

EPIDEMIOLOGY AND PREVALENCE

Research conducted across different regions suggests that the prevalence of AUD and CKD has a varying association.^{12,13} Some studies report greater risks while others refute it. Regardless, there is some consensus that heavy drinking over prolonged periods can be detrimental to kidney function. The differences may arise because of differences in drinking habits, family history, and access to healthcare facilities. For instance, some research from Korea and the US claims that chronic alcohol users tend to have higher levels of serum creatinine alongside lower estimated glomerular filtration (eGFR), indicating reduced renal function.^{13,14} This passage seeks to analyze the literature on the prevalence of CKD among drinkers while focusing on subdividing the information with regard to sex, age, and social stratification to understand the relationships better.

RISK FACTORS AND ASSOCIATED COMORBIDITIES

Heavy drinkers are more susceptible to CKD for a variety of reasons. High blood pressure, diabetes, and liver cirrhosis – all potential outcomes of alcohol consumption – also tend to increase the burden on the kidneys.^{7,15} Liver cirrhosis, in particular, can sometimes result in a serious condition known as hepatorenal syndrome,^{3,16} which is the sudden decline in kidney function. Apart from this, heavy drinkers are often challenged with poor nutrition, smoking, drug use, and a lack of routine medical check-ups.^{9,5,10,11} All of these combine to a greater problem of a faster rate of kidney damage. This part analyzes that CKD in alcoholics is usually multifactorial instead of purely alcohol-driven.

DIAGNOSTIC AND CLINICAL IMPLICATIONS

Diagnosing CKD in patients with AUDs presents significant challenges. Often, the initial signs are obscured by a multitude of other health issues associated with heavy drinking, leading many individuals to seek help only when their condition has severely declined.^{3,11} Standard diagnostic procedures – such as serum creatinine testing, evaluation of kidney filtration rates (commonly referred to as eGFR), or urine albumin analysis – frequently fail to identify the problem in its early stages.⁶ Chronic alcohol consumption typically results in poor nutritional status and muscle loss, which can lower creatinine levels and create a false sense of normalcy regarding kidney function.^{3,8,11} There is a palpable improvement in the screening strategies, including use of innovative biomarkers and imaging techniques. However, the complexities involved in accurately utilizing these methods for this unique patient group exist.^{4,15}

MANAGEMENT AND PREVENTIVE STRATEGIES

For many dealing with chronic kidney issues while also facing alcohol challenges, the first step is pretty simple – stop drinking.³ Cutting out alcohol can help steady how your kidneys work and sometimes even spark early improvement, but honestly, quitting is only the opening move. You also have to watch over conditions such as high blood pressure and diabetes, making sure that they are kept in line.¹⁶ Quite a few patients end up needing extra help with nutrition, especially if they are underfed – a problem that, quite frankly, pops up a lot among heavy drinkers.⁹ Medicines too, must be picked with care since liver troubles from alcohol can really throw off the way your body handles drugs.^{7,15} All in all, prevention matters a ton; this means bumping up awareness, nudging early screening, and focusing public health efforts on those most at risk.^{11,12}

NUTRITIONAL STRATEGIES TO OVERCOME THIS ISSUE

To prevent any further kidney injury and systemic toxicity, nutritional management can play a crucial role. Complete abstinence is to be maintained, which can prevent dehydration, hypertension, and oxidative stress. The macro nutrients like protein, again have an important role in controlling the progression of the condition. For CKD Stages 1-3: a moderate protein restriction of 0.8 to 1.0 g/kg/day is recommended. For CKD Stages 4-5 (non-dialysis), a lower protein intake of 0.6 to 0.8 g/kg/day is advised, while dialysis patients should aim for 1.0 to 1.2 g/kg/day. Micronutrients should be included to avoid any deficiency such as thiamine (B1), folate, B12, vitamin D, calcium, magnesium, zinc, and selenium. Managing sodium intake to avoid any fluid retention and to control blood pressure. Potassium and phosphorus restriction should be monitored.

GAPS IN RESEARCH AND FUTURE DIRECTIONS

While there is a growing awareness of the possible connection between alcohol consumption and CKD, significant gaps in knowledge persist. Many current studies fail to adequately account for confounding variables such as smoking, hypertension, or diabetes, complicating the assessment of alcohol's specific effects on kidney health.^{4,12} Longitudinal cohort studies are crucial for clarifying causal relationships. Furthermore, additional research is necessary to explore genetic factors, ethnic differences, and the impact of various drinking patterns – such as binge drinking compared to regular consumption – on CKD risk.⁶ Future initiatives should focus on improving early diagnostic methods and creating targeted prevention and treatment approaches for individuals with AUDs.^{11,17}

CONCLUSION

The above review reveals that alcohol consumption over time is a known risk factor for CKD, but this association was attenuated by some contributing factors. Understanding the pathways beginning well before the onset of the disease state is essential for early detection, reduction in comorbid risk factors, and creation of more effective therapeutic strategies. Given the commonality of alcohol use in the general population as well as the worldwide burden of CKD, dedicated research efforts and multidisciplinary treatment paradigms are needed to mitigate adverse outcomes in these patients.

Ethical approval: Institutional Review Board approval is not required.

Declaration of patient consent: Patient's consent is not required as there are no patients in this study.

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation: The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

REFERENCES

1. Lee YJ, Cho S, Kim SR. Effect of Alcohol Consumption on Kidney Function: Population-Based Cohort Study. *Sci Rep* 2021;11:2381.

2. Kistler BM, Fitschen PJ, Avenell A. Nutrition in Patients with Chronic Kidney Disease and Alcohol Use Disorders. *Clin J Am Soc Nephrol* 2017;12:1466-73.
3. Perneger TV, Whelton PK, Klag MJ. Alcohol Consumption and End-Stage Renal Disease. *Kidney Int* 2001;60:96-104.
4. Choi YJ, Jung HW, Kim SW, Shin HC. The Effects of Alcohol on Kidney Function: A Population-Based Study. *Kidney Int* 2017;91:964-71.
5. Zou H, Zhang X, Zhou B, Liu W, Tang S. Alcohol Consumption Risk of Chronic Kidney Disease, and Related Outcomes: A Systematic Review. *Nephrol Dial Transplant* 2011;26:1397-405.
6. Tomlinson LA. Is there a Role for Lifestyle Interventions in CKD Progression? *Nephron Clin Pract* 2016;134:86-91.
7. Vikse BE. A Population-Based Study of the Natural Course of IgA Nephropathy in Adults. *N Engl J Med* 2008;359:240-8.
8. Schiffrin EL, Lipman ML, Mann JF. Chronic Kidney Disease: Effects on the Cardiovascular System. *Circulation* 2007;116:85-97.
9. Moeinzadeh F, Shahidi S, Seirafian S, Rouhani MH, Mortazavi M, Maghami-Mehr A, *et al.* Association of Alcohol Consumption with the Prevalence and Various Stages of Chronic Kidney Disease. *J Res Med Sci* 2023;28:26.
10. Schaeffner ES, Kurth T, Curhan GC, Glynn RJ, Rexrode KM, Buring JE. Alcohol Consumption and the Risk of Renal Dysfunction in Apparently Healthy Men. *Arch Int Med* 2005;165:1048-53.
11. Stengel B. Chronic Kidney Disease and Cancer: A Troubling Connection. *J Nephrol* 2010;23:253-62.
12. Liangpunsakul S. Relationship between Alcohol and Kidney Disease: A Review of Epidemiologic and Experimental Studies. *World J Nephrol* 2014;3:123-30.
13. Mantovani A, Petracca G, Beatrice G, Csermely A. Non-Alcoholic Fatty Liver Disease and Risk of Incident Chronic Kidney Disease: An Updated Meta-Analysis. *Gut* 2020;71:156-62.
14. Ronksley PE, Brien SE, Turner BJ, Mukamal KJ, Ghali WA. Association of Alcohol Consumption with Selected Cardiovascular Disease Outcomes: A Systematic Review and Meta-Analysis. *BMJ* 2011;342:d671.
15. Kwon MJ, Yoon YC, Lee HJ, Cho B. Association between Alcohol Intake and Chronic Kidney Disease: The Korean National Health and Nutrition Examination Survey (2012-2014). *Sci Rep* 2018;8:13038.
16. Zoccali C, Vanholder R, Massy ZA, Ortiz A, Sarafidis P, Dekker FW, *et al.* The Systemic Nature of CKD. *Nat Rev Nephrol* 2017;13:344-58.
17. Yoon SJ, Kim HY, Lee YA, Park B. Alcohol Consumption and the Risk of Chronic Kidney Disease: A Systematic Review. *BMC Nephrol* 2020;21:343.

How to cite this article: Priya SH, Sunnapu BY. Understanding the Prevalence of Chronic Kidney Disease in Alcoholic Patients. *J Compr Health*. 2026;14:5. doi: 10.25259/JCH_33_2025