International Journal of Scientific Reports
Lal KC et al. Int J Sci Rep. 2025 Oct;11(10):381-382
http://www.sci-rep.com
pISSN 2454-2156 | eISSN 2454-2164
DOI: https://dx.doi.org/10.18203/issn.2454-2156.IntJSciRep20252950

Letter to the Editor

Beyond prevalence: rethinking climate-driven risk for cholelithiasis in a warming world

Sir,

Cholelithiasis, also known as a gallbladder stone, is a significant health issue that contributes to the global health burden, affecting millions of people worldwide. Many risk factors have already been identified, but seasonal variations, especially in summer, where the surge of cases is seen, are less explored.[1] It is also noteworthy that global warming is not only the hazardous factor for climate which can lead to long hot seasons but also for the health of living beings, in humans, it can cause heat strokes, and if sustained it increase the risk of renal stones, and gallstones by various mechanism such as dehydration.[2,3] This letter aims to address the potential link between the climate and cholelithiasis and an urgent call for health authorities to deal with it efficiently and accordingly.

Globally, the majority of cholelithiasis patients remain asymptomatic by which means this underdiagnosed condition can further worsen into cholecystitis, cholangitis, jaundice, mucocele, empyema, gangrenous cholecystitis, and emphysematous cholecystitis, less frequent but not uncommon are Mirizzi syndrome, cholecysto-enteric fistulas, and may transform into malignant neoplasm because the stone may dislodge and become trapped in the biliary passage and liver.[4,5] In addition, gallstones can also increase the risk of health conditions, including cardiovascular disease (CVD), type 2 diabetes, autoimmune disease, pancreatitis, cancer, and kidney stones. Despite its wider prevalence and significant health risk, especially in the summer season or on hot days, this climate-induced cholelithiasis is still overlooked. It is also worth mentioning that women are at high risk of developing cholelithiasis because their sexual hormones, such as estrogen and progesterone, promote the synthesis of cholesterol and delayed gall bladder emptying.[6] Potential mechanisms for climate-induced cholelithiasis include supersaturation of bile with cholesterol, as dehydration due to hot days slows colonic motility, which causes faecal stasis, leading to a high level of absorption of deoxycholic acid in the colon, which in turn stimulates the liver to secrete more cholesterol and leads to gallstone formation.[4] Additionally, dehydration delays the gallbladder's emptying, which in turn leads to the stasis of cholesterol and promotes the formation of gallstones.[7]

Since dehydration due to a hot climate, a potential cause for cholelithiasis, in addition to that, hot weather and extreme conditions, causes the patients to rush to emergency rooms and hospital admissions, increases death surge from cardiorespiratory and other diseases, alters mental health, pregnancy, birth outcomes, which ultimately increases the health-care costs and public health burden.[8] Also, many hazardous gases such as carbon dioxide, phosphorus, and oxides of nitrogen disrupt our greenhouse effect, which can lead to global warming and ultimately make the world unsustainable for life.[2]

To mitigate this risk factor or disease, it is necessary to address the potential link between climate and cholelithiasis in a broader context to get much deeper and more valuable insights into it. For the climate, it is necessary to take immediate measures to reduce global warming by implementing such strategies as the use of renewable resources, encouraging people to plant trees by arranging awareness campaigns, and educating people to drink plenty of water during hot days to reduce the risk not only for cholelithiasis but also for heat stroke and other associated conditions.[2]

To date, only limited studies explore the potential link between cholelithiasis and climate, despite this condition is most commonly and regularly seen in hospital settings, especially in the summer season, yet remains overlooked. We urge the health and government authorities to take necessary and immediate steps to deal with this threat efficiently with good outcomes.

Karan C. Lal[1]*, Manesha Kumari[2], Karishma Kumari[3]

[1]Department of Medicine, Liaquat University of Medical & Health Sciences, Jamshoro, Sindh, Pakistan
[2]Independent Researcher, Hyderabad, Sindh, Pakistan
[3]Department of Medicine, Indus Medical College, Tando Muhammad Khan, Sindh, Pakistan

***Correspondence to**
Dr. Karan C. Lal,
E-mail: karan.chaman12@gmail.com

REFERENCES

1. Reda AS, Aboulkhair LA, Almsarri MY. The Effect of Seasonal Variation on Developing Acute Cholecystitis among Adult Patients in Jeddah, Saudi Arabia. Int J Healthc Sci. 2015;3:274-7.
2. Rossati A. Global Warming and Its Health Impact. Int J Occup Environ Med. 2016;8(1):7.

3. Alsaigh SH, Aloqla AA, Alzaaqi FO, Alsowiyan AA, Almutairi AK, Mohamed A, et al. Effect of Seasonal Variation on the Incidence of Gallbladder Stone Complications. Cureus. 2025;17(5).
4. Taib A, Killick R, Hussain K, Patel H, Obeidallah MR. Is there seasonal variation in gallstone related admissions in England? HPB. 2021;23(11):1732-43.
5. Cianci P, Restini E. Management of cholelithiasis with choledocholithiasis: Endoscopic and surgical approaches. World J Gastroenterol. 2021;27(28):4536.
6. Wang X, Yu W, Jiang G, Li H, Li S, Xie L, et al. Global Epidemiology of Gallstones in the 21st Century: A Systematic Review and Meta-Analysis. Clin Gastroenterol Hepatol. 2024;22(8):1586-95.
7. Auda F, Adnan T, Resul T. Seasonality of Acute Cholecystitis: A Review of Global Patterns. Int J Surg Res Pract. 2022;9(3):146.
8. Ebi KL, Capon A, Berry P, Broderick C, de Dear R, Havenith G, et al. Hot weather and heat extremes: health risks. Lancet. 2021;398(10301):698-708.

Cite this article as: Lal KC, Kumari M, Kumari K. Beyond prevalence: rethinking climate-driven risk for cholelithiasis in a warming world. Int J Sci Rep 2025;11(10):381-2.