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Incidence Risk Factors and Outcomes of Acute Liver Injury in Hospitalized Adults with Acute Kidney Injury: A Large Multicentre Study

Kiara Patrick*

Department of Nephrology, "Carol Davila" University of Medicine and Pharmacy, 050474 Bucharest, Romania

Abstract

Acute liver injury and acute kidney injury are critical conditions often seen in hospitalized patients, each associated with significant morbidity and mortality. The intersection of these two conditions can compound patient outcomes, presenting a complex clinical challenge. This article explores the incidence, risk factors, and outcomes of ALI in patients with AKI, based on data from a large multicenter study. ALI is characterized by a sudden increase in liver enzymes, indicating liver cell damage. AKI involves a rapid decline in kidney function, leading to the accumulation of waste products in the body. Both conditions can arise from various etiologies, including drug toxicity, infections, ischemia, and underlying chronic diseases. The interplay between liver and kidney functions, often referred to as the hepatorenal axis, suggests that dysfunction in one organ can significantly impact the other.

Keywords: Injury • Kidney • Infections

Introduction

Retrospective analysis of medical records, including liver function tests, kidney function tests, patient demographics, comorbidities, medication usage, and clinical outcomes. The study encompassed patient data over a period of several years to ensure comprehensive analysis [1]. Approximately 20-25% of patients with AKI developed ALI during their hospital stay. ALI often developed shortly after the onset of AKI, suggesting a potential causative or exacerbating relationship. A significant proportion of patients with concurrent AKI and ALI had underlying sepsis, indicating a strong association between systemic infections and organ dysfunction [2].

Literature Review

The use of nephrotoxic and hepatotoxic drugs was prevalent among patients who developed ALI. Medications such as non-steroidal anti-inflammatory drugs antibiotics, and chemotherapeutic agents were common culprits. Patients with underlying chronic liver conditions, such as cirrhosis or Hypotension and Ischemia: Episodes of hypotension, leading to reduced perfusion of the liver and kidneys, were frequently observed in patients with both conditions. Comorbidities such as diabetes, obesity, and hypertension were common in patients with AKI and ALI, highlighting the role of metabolic syndrome in exacerbating organ dysfunction. The mortality rate in patients with both ALI and AKI was substantially higher. These patients had an in-hospital mortality rate exceeding 50%, compared to lower rates in patients with AKI alone. Patients with ALI had longer hospital stays, reflecting the increased complexity and need for prolonged medical care. A higher proportion of patients with ALI required intensive care unit admissions, often due to the need for advanced supportive therapies, including mechanical ventilation and dialysis. The need for organ support, such as renal replacement therapy and vasopressor support was markedly higher in patients with concurrent ALI and AKI [3].

Discussion

Recovery rates were lower, and those who survived had a prolonged and complicated recovery period, often with lasting organ dysfunction and increased healthcare utilization post-discharge. AKI can trigger a systemic inflammatory response that affects multiple organs, including the liver. Cytokines and inflammatory mediators released during AKI can exacerbate liver injury. Both AKI and ALI are associated with increased oxidative stress, leading to cellular damage in both the liver and kidneys. Episodes of hypotension and subsequent reperfusion can cause significant damage to both organs, contributing to the development of ALI in the setting of AKI. Impaired kidney function can alter the metabolism and excretion of drugs, leading to increased hepatotoxicity and vice versa. Early Identification and Monitoring: Clinicians should be vigilant in monitoring liver function in patients with AKI, especially those with identified risk factors such as sepsis or medication use. Implementing strategies to prevent hypotension, manage infections promptly, and minimize the use of nephrotoxic and hepatotoxic drugs can help reduce the incidence of ALI. Managing patients with concurrent ALI and AKI requires a multidisciplinary approach, involving nephrologists, hepatologists, critical care specialists, and pharmacists. Research and Guidelines: Further research is needed to develop evidence-based guidelines for the management of patients with ALI and AKI, focusing on early intervention and tailored therapeutic strategies [4-6].

Conclusion

The intersection of acute liver injury and acute kidney injury presents a significant clinical challenge, with high incidence rates and poor outcomes in hospitalized adults. Identifying risk factors such as sepsis, medication toxicity, pre-existing liver disease, hypotension, and metabolic syndrome is crucial for early intervention and improved patient management. By understanding the mechanisms underlying the relationship between ALI and AKI, healthcare providers can develop targeted strategies to mitigate risks and enhance patient outcomes. Ongoing research and clinical trials are essential to refine our understanding and treatment approaches for this complex interplay between liver and kidney dysfunction. In the meantime, a proactive and

***Address for Correspondence:** Kiara Patrick, Department of Nephrology, "Carol Davila" University of Medicine and Pharmacy, 050474 Bucharest, Romania; E-mail: iaraatrickpkp@gamil.com*

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vigilant approach to monitoring and managing these critically ill patients can help reduce mortality and improve recovery prospects.

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Conflict of Interest

None.

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