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**ARTICLE OF THE MONTH**

MacDonald A, Nadim M, Durand F, Karvellas C. Acute kidney injury in cirrhosis: implications for liver transplantation. *Current Opinion in Critical Care*. 2019; 25 (2): 171-178

**Abstract:**

**“Purpose of review**

Acute kidney injury (AKI) in cirrhosis consists of varying phenotypes, with hepatorenal syndrome (HRS) representing a single entity. Prompt recognition and diagnosis of AKI cause identifies appropriate therapeutic measures. This review provides an overview of AKI definitions, highlights challenges in quantifying renal impairment in cirrhosis, lists novel diagnostic AKI biomarkers, and summarizes transplantation implications.

**Recent findings**

Biomarkers (neutrophil gelatinase-associated lipocalin, kidney injury molecule-1, interleukin-18, and liver- type fatty acid-binding protein) may assist in the identification of underlying acute tubular necrosis. Of these, neutrophil gelatinase-associated lipocalin is the most promising; however, significant overlap occurs among AKI phenotypes, with diagnostic values yet to be defined. Mainstay treatment of HRS consists of albumin and vasopressors. Acute-on-chronic liver failure grade independently predicts response to terlipressin treatment. Many end-stage liver disease patients with AKI have underlying chronic kidney disease with important implications on pre and postliver transplantation mortality. Simultaneous liver– kidney transplant candidacy is based on low likelihood of renal recovery.

**Summary**

Novel biomarkers may assist in identification of acute tubular necrosis and persistent/severe AKI. Norepinephrine has been suggested to be inferior to terlipressin, with additional research required. Increasing acute-on-chronic liver failure grade correlates with lower likelihood of vasopressor response in HRS. Severe preliver transplantation AKI confers significantly worse postliver transplantation renal outcomes.”

COMMENTS MADE BY CROUCH, CARA MD

**Summary:**

This article by MacDonald et al was chosen from the April 2019 issue of Current Opinion in Critical Care which partially focused on the gastrointestinal system. Recently, there has been ongoing interest in management of AKI in liver transplant patients as well as significant research directed toward AKI prevention post-transplant. This article offers an excellent review of AKI in patients with ESLD and its relevance for patients who are to undergo transplantation. With the current MELD scoring system we will continue to see patients with kidney failure present to the operating room for transplantation, therefore a thorough understanding of the physiology and management of disease process is imperative for transplant anesthesiologists.

This article starts with defining the diagnostic criteria for AKI in the setting of cirrhosis as well as a review of the causes. There is an excellent table reviewing the different definitions of AKI by major studies, highlighting the variability in these definitions. A discussion of the evaluation of renal function, GFR versus serum creatinine and the advantages and disadvantages of each. A brief review of additional clearance estimation methods and novel biomarkers follows; however, these markers are often expensive and not widely available.

This article then diverges to discuss the overall therapeutic approach to AKI and, specifically, the management of hepatorenal syndrome. Though liver transplantation remains the sole definitive treatment option for HRS, there are important approaches to managing these patients pre-operatively in order to optimize their overall status. The article reviews albumin, vasopressor treatment and TIPS and their effect on the reduction of portal hypertension in an attempt to allow for renal recovery of patients with HRS.

A brief review of liver transplantation in patients with AKI, including both liver and simultaneous liver and kidney (SLK) transplant concludes the article. As discussed, patients with pre-transplant AKI must be managed very carefully if they are not being considered for SLK in an attempt to avoid the need for a subsequent kidney transplantation at a later time. Given the high morbidity and mortality associated with AKI in patients with ESLD and the continued interest in the avoidance of post-operative AKI, this topic will remain highly relevant for the foreseeable future.

**References:**

1. MacDonald A, Nadim M, Durand F, Karvellas C. Acute kidney injury in cirrhosis: implications for liver transplantation. *Current Opinion in Critical Care*. 2019; 25 (2): 171-178

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