



# A Comprehensive Review On Acute Kidney Injury And Its Risk Factors

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## Abstract

Acute kidney damage (AKI) is a serious clinical illness that has a negative impact on the prognosis of a large proportion of hospitalised patients. This in-depth analysis looks at the pathogenesis, risk factors, and treatment options related to AKI. A rapid reduction in renal excretory function that disturbs fluid homeostasis and acid-base balance is the hallmark of AKI. Different age groups are most affected by AKI, and the epidemiology of the disease varies across developing and industrialised countries. AKI is caused by a number of risk factors, such as environmental, social, cultural, and patient-related variables.

The management of AKI involves evaluating the underlying causes, considering the clinical course and comorbidities, assessing volume status, and implementing appropriate therapeutic measures. Pharmacological interventions, such as loop diuretics, vasoactive agents, and statins, have shown promise in the treatment and prevention of AKI. This review provides a comprehensive overview of AKI, highlighting the need for early recognition, appropriate management, and preventive strategies to mitigate its impact on patient outcomes.

**Keywords:** Acute Kidney Injury (AKI), renal excretory function, Glomerular Filtration Rate (GFR), tubular metabolic acidosis, homeostasis.

## I. INTRODUCTION

A high percentage of hospitalised patients have a clinical condition called acute damage (AKI), which complicates the course of the illness and worsens the outcome<sup>1</sup>.

Acute kidney damage, or AKI, is the term used to describe a sudden reduction in renal excretory function<sup>2</sup>.

The epidemiology of AKI varies significantly between industrialized and underdeveloped countries. In underdeveloped nations, AKI is a disease of the young and children, in whom volume-responsive "prerenal" mechanisms are common; in developed regions, older patients predominate<sup>3</sup>.

Clinical manifestations of acute kidney injury are tiredness, anorexia, disorientation, nausea, vomiting, weight gain, or oedema<sup>4</sup>.

## II. PATHOPHYSIOLOGY

A disruption in the kidneys primary function (maintaining homeostasis) is implied by a loss of excretory function. As the renin-angiotensin system is activated and the glomerular filtration rate (GFR) decreases, fluid homeostasis is impacted.

The acid-base balance is also impacted by AKI. Patients with AKI experience tubular metabolic acidosis due to a decreased ability to excrete fixed acids, and their respiratory system responds by increasing their ventilatory drive<sup>2</sup>.

### III. RISK FACTORS

Acute exposures, environmental, social, and/or cultural variables, as well as aspects of the healthcare system and patients themselves, are all risk factors for AKI. Poor drinking and waste water systems, poor measures to manage infectious diseases, and insufficient health care systems are examples of environmental factors. Patient-related factors can be either modifiable or non-modifiable, such as chronic kidney, heart, liver, or gastrointestinal illness, diabetes, severe infections, and sepsis. Modifiable patient-related factors include volume depletion, hypotension, anaemia, hypoxia, and use of nephrotoxic medicines<sup>2</sup>. While diabetics with baseline CKD are the patient group most at risk for developing AKI, older age, a history of diabetes, hypertension, congestive heart failure, peripheral vascular disease, sepsis, use of nephrotoxic drugs, higher severity of disease scores, use of vasopressors/inotropes, high risk surgery, emergency surgery, hemodynamic instability, use of an intra-aortic balloon pump, and anaemia requirement are all reported risk factors for AKI<sup>5</sup>.

### IV. MANAGEMENT

Acute kidney injury (AKI) patients should receive the following initial management: a) an evaluation of the contributing causes of the kidney injury, b) an evaluation of the clinical course, taking into account comorbidities, c) a careful evaluation of volume status, and 4) the implementation of appropriate therapeutic measures intended to reverse or prevent worsening of functional or structural kidney abnormalities<sup>6</sup>. The first pharmacological method for treating AKI involves pharmaceuticals such loop diuretics (furosemide, bumetanide, torsemide), mannitol, vasoactive agents renal vasodilators, erythropoietin, and statins, which are frequently used in intensive care for sustaining AKI. For their therapeutic efficacy in treating and preventing renal illness, fresh pieces of data have been examined<sup>7</sup>.

### V. CONCLUSION

The clinical condition known as acute kidney injury (AKI) is complicated and is accompanied by high rates of morbidity and mortality. This thorough overview emphasises how crucial it is to comprehend the etiology, risk factors, and treatment options for AKI. Recognizing AKI early and identifying the underlying causes are crucial steps in effective management. Healthcare professionals should consider a range of risk factors, including environmental, social, cultural, and patient-related factors, to implement preventive measures and optimize patient outcomes. Additionally, assessing volume status and implementing appropriate therapeutic interventions are essential for reversing or halting the progression of AKI. Pharmacological approaches, such as loop diuretics, vasoactive agents, and statins, hold promise in the treatment and prevention of AKI. Further research and clinical studies are warranted to refine our understanding of AKI and develop targeted interventions. Overall, this review highlights the need for a multidisciplinary approach, early intervention, and tailored management strategies to mitigate the impact of AKI and improve patient outcomes.

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