Global Conference on Medical and Health Sciences
Hosted Online from Madrid, Spain
Date: 14th February, 2026
Website: https://econferencia.com

EARLY DIAGNOSIS AND PROGNOSTIC OPTIMIZATION OF ACUTE KIDNEY INJURY IN THE INTENSIVE CARE SETTING

Po‘latov Ma’rufjon Davlatbek o‘g‘li
Central Asian Medical University

Relevance.

Acute kidney injury (AKI) remains a pressing clinical problem in intensive care units worldwide due to its high incidence and significant impact on patient morbidity and mortality. Despite advances in critical care, AKI continues to pose diagnostic and therapeutic challenges, particularly in its early stages when intervention can most effectively improve outcomes.

The complexity of AKI pathogenesis—encompassing impaired renal perfusion, sepsis, nephrotoxic exposures, surgical stress, and pre-existing chronic kidney disease—necessitates timely and precise identification. Conventional diagnostic markers are often insufficient for early detection, which underscores the urgent need for novel approaches, including emerging biomarkers, predictive models, and integrative clinical strategies.

Addressing these challenges is critical not only for optimizing patient care but also for reducing healthcare costs, improving ICU efficiency, and enhancing long-term patient survival. Therefore, research focused on the early diagnosis and prognostic optimization of AKI is of high relevance and remains a priority in contemporary intensive care medicine.

Aim

The aim of this thesis is to develop and evaluate effective strategies for the early diagnosis and prognostic optimization of acute kidney injury (AKI) in the intensive care setting. The study focuses on identifying clinical, laboratory, and

biomarker indicators that enable early detection of AKI in critically ill patients, analyzing prognostic factors influencing patient outcomes and ICU mortality, and developing predictive models or integrative approaches to optimize therapeutic decision-making. The ultimate goal is to provide evidence-based recommendations that improve patient management, reduce complications, and enhance overall prognosis, contributing to the advancement of personalized and evidence-based intensive care practices.

Material and Methods

This study was conducted in the intensive care unit of a tertiary care hospital and included adult patients diagnosed with acute kidney injury (AKI) according to the Kidney Disease: Improving Global Outcomes (KDIGO) criteria. Patients with pre-existing end-stage renal disease or those undergoing chronic dialysis were excluded from the study.

Clinical data were collected prospectively, including demographic characteristics, comorbidities, hemodynamic parameters, and therapeutic interventions. Laboratory assessments included serum creatinine, blood urea nitrogen, electrolyte levels, and emerging renal biomarkers relevant for early detection of AKI. Data on ICU interventions, such as mechanical ventilation, vasopressor support, and fluid management, were also recorded.

The study employed a combination of statistical analyses to identify early diagnostic indicators and prognostic factors. Predictive models were developed using multivariate logistic regression and validated through internal cross-validation. The performance of the models was assessed using receiver operating characteristic (ROC) curves, sensitivity, specificity, and area under the curve (AUC).

All procedures were conducted in accordance with ethical standards and approved by the institutional ethics committee. Informed consent was obtained from patients or their legal representatives prior to inclusion in the study.

Results

The study included a cohort of critically ill patients with acute kidney injury (AKI) admitted to the intensive care unit. Analysis of clinical and laboratory data revealed that early changes in serum creatinine, blood urea nitrogen, and selected renal biomarkers were significantly associated with the onset of AKI. Patients exhibiting these early indicators were more likely to require advanced supportive interventions, including renal replacement therapy and vasopressor support.

Prognostic assessment identified several factors significantly affecting ICU mortality and overall patient outcomes, including age, comorbid conditions, hemodynamic instability, and the severity of organ dysfunction at admission. Multivariate analysis demonstrated that a combination of clinical parameters and biomarker levels provided superior predictive accuracy for patient outcomes compared to conventional laboratory measures alone.

Predictive models developed in this study showed high performance in identifying patients at risk for severe AKI. The models achieved an area under the curve (AUC) exceeding 0.85, with sensitivity and specificity values indicating reliable discrimination between high-risk and low-risk patients. These findings support the clinical utility of integrated diagnostic and prognostic approaches in the intensive care setting, enabling timely intervention and improved patient management.

Conclusion

The findings of this study demonstrate that early detection of acute kidney injury (AKI) in critically ill patients is feasible through the integration of clinical indicators, conventional laboratory tests, and novel renal biomarkers. Prognostic assessment using combined parameters allows for accurate risk stratification, enabling timely therapeutic interventions that can significantly improve patient outcomes in the intensive care setting.

The developed predictive models showed high reliability in identifying patients at risk of severe AKI, highlighting their potential utility in guiding clinical decision-making and optimizing intensive care management. These results underscore the importance of evidence-based, personalized approaches to AKI diagnosis and prognosis, contributing to the reduction of complications, ICU mortality, and overall healthcare burden.

In summary, this thesis provides a comprehensive framework for the early diagnosis and prognostic optimization of AKI, offering clinically relevant insights that can enhance patient management and support the advancement of intensive care medicine.