**Renal Data from Asia–Africa**

**Clinical Spectrum of Community-Acquired Acute Kidney Injury: A Prospective Study from Central India**

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**ABSTRACT.** The aim is to study the epidemiology of acute kidney injury (AKI), since it differs from country to country and varies from center to center within a country. Owing to the absence of a central registry, data on overall epidemiology of AKI are scanty from India. This study was conducted in an urban tertiary care center in central India with the aim to identify the etiology and outcomes as well as the factors associated with in-hospital mortality of community-acquired AKI (CAAKI) patients. A two-year prospective study of all patients with CAAKI admitted to the Nephrology Department from January 2014 to December 2015 was performed. Of the 9800 admitted patients, 286 patients (2.9%), with a mean age of 48 ± 17.1 years, were diagnosed to have CAAKI as per our specified criteria. The most common cause of CAAKI was medical (77.27%), followed by obstetrical (13.98%) and surgical (9%) causes. Among the medical causes, hypoperfusion (57.4%) was the most common, followed by sepsis (26.69%), glomerulonephritis (8.14%), and drugs (7%). Nephrolithiasis was the most common surgical cause. Puerperal sepsis (52.5%), preeclampsia (20%), hemorrhage (17.5%), and thrombotic microangiopathy (10%) were the obstetric causes of CAAKI. The overall in-hospital mortality among patients with CAAKI was 20% and 8% of patients became dialysis dependent. Sepsis had the highest in-hospital mortality (44%). The epidemiological characteristics of CAAKI are changing rapidly. There has been an increase in the overall incidence of AKI with changing etiology in recent years. In contrast to developed nations, CAAKI is more common in developing countries. It often affects younger individuals. For early diagnosis of kidney injury and reducing the risk of poor outcome, patients should be referred to nephrologists early in the course of disease.

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**Introduction**

Acute kidney injury (AKI) is a syndrome characterized by rapid decline in the glomerular filtration rate (GFR) and retention of nitrogenous waste products such as blood urea nitrogen and creatinine (Cr). The International
Society of Nephrology has recognized AKI as a major health concern and it aims to curb down mortality associated with AKI to zero by 2025 (0 by 25 initiative). Knowledge of incidence and risk factors is crucial because it drives local and international efforts on detection and treatment. Furthermore, notable differences exist between developing and developed countries: incidence seems higher in the former, but under-reporting compounded by age and gender disparities makes available data unreliable. In developed countries, trauma, surgery, and sepsis contribute to a majority of the cases of AKI. In developing countries, the incidence varies seasonally. In addition, in developing countries, higher incidence of sepsis, lack of trained persons to deal with intensive care, lack of systematic evaluation of the role of falciparum malaria, obstetric mechanisms, and the hemolytic uremic syndrome (HUS) hampers efforts to prevent AKI. Limited data are available on the etiology and outcome of AKI in the Indian population, especially from central India. An understanding of the etiology of AKI is important to establish its overall burden, risk factors, and devising potential preventive strategies.

AKI in hospitalized patients is associated with high rates of morbidity, mortality, and consumption of health-care resources. In the past few decades, nephrology care in India has seen impressive advancements. Despite improvements in preventive and diagnostic facilities, community-acquired AKI (CAAKI) still remains a major reason for admission to nephrology units in India. AKI in tropical countries occurs in the younger age-group and usually follows infections and obstetric complications. Poor hygiene, warm climate, low socioeconomic status, widespread availability of over-the-counter drugs, and high incidence of infections such as malaria and leptospirosis contribute to the varied etiology of CAAKI seen in India. It is important to understand that the epidemiology of CAAKI will be influenced by changes in the epidemiology of infections causing it. For example, malarial AKI, which was seen predominantly in Plasmodium falciparum infections, is being increasingly seen in Plasmodium vivax infections. Sethi et al have demonstrated an increasing incidence of leptospirosis in northern India from 11.5% in 2004 to 20.5% in 2008.

A significant trend in the epidemiology of CAAKI is being observed in the past few years. The incidence of diarrheal disease, intravascular hemolysis, copper sulfate poisoning, and obstetric CAAKI are decreasing. A single-center study from eastern India has shown a reduction in the incidence of acute cortical necrosis from 6.7% in 1994 to 1.6% in 2005. In contrast, there is an increase in the incidence of drug-induced, surgical and sepsis-related AKI.

These changes mandate the need for frequent epidemiological studies to devise preventive and therapeutic strategies. The aim of the present study is to identify the etiology and outcome of CAAKI and analyze the risk factors for in hospital mortality in patients admitted with CAAKI.

**Patients and Methods**

We conducted a prospective study of all patients who were admitted in Shri Aurobindo Medical College and Postgraduate Institute, Indore, India from January 2014 to December 2015. The facility is a tertiary care referral center in central India catering to the states of Madhya Pradesh, Uttar Pradesh, Rajasthan, and Gujarat in India. All patients with AKI were subjected to a detailed history and thorough clinical examination. Particulars such as name, age, sex, address, and contact information were noted in a prestructured pro forma. Subjects were also asked regarding the past medical illnesses which can be a risk factor for AKI. Detailed history regarding drugs and other ayurvedic or naturopathy preparation was recorded. Immunological assays, such as hepatitis B surface antigen, anti-hepatitis C virus, anti-nuclear antibody, anti-double-stranded DNA, anti-neutrophil cytoplasmic antibody, and anti-glomerular basement membrane antibody were performed in selected cases. AKI was defined as per the Kidney Disease: Improving Global Outcomes...
(KDIGO) guidelines. The KDIGO criteria only utilize changes in serum Cr (SCr) and urine output, and not changes in GFR for staging, with the exception of children under the age of 18 years, for whom an acute decrease in estimated GFR (eGFR) to <35 mL/min/1.73 m² is included in the criteria for stage 3 AKI. Using the KDIGO criteria, AKI was staged as follows:

Stage 1: 1.5–1.9 times baseline [≥26.5 µmol/L; odds ratio (OR) ≥0.3 mg/dL] increase in the SCr, OR urine output <0.5 mL/kg/h for 6–12 h.

Stage 2: 2.0–2.9 times baseline increase in the SCr or OR urine output <0.5 mL/kg/h for ≥12 h.

Stage 3: 3.0 times baseline increase in the SCr OR increase in SCr to ≥4.0 mg/dL (≥353.6 µmol/L) OR urine output of <0.3 mL/kg/h for ≥24 h, OR anuria for ≥12 h OR the initiation of renal replacement therapy (RRT) OR, in patients <18 years, decrease in eGFR to <35 mL/min/1.73 m².

Patients admitted with SCr <1.2 mg/dL, postrenal transplant recipients, patients on chronic dialysis therapy, and pediatric patients were excluded from the study. Decreased renal perfusion was identified by one or more of the following: (a) decrease in blood pressure to <90/60 mm Hg, (b) evidence of congestive heart failure, (c) signs of volume depletion, and (d) improvement with the restoration of blood flow. Drugs were identified as cause of CAAKI when there was a temporal relationship to the administration of the drug, in the absence of other causative mechanisms. Sepsis was defined as two or more of the following as a result of proven or suspected infection: (a) temperature >38°C or <36°C, (b) heart rate >100/min, (c) respiratory rate >24/min, and (d) white blood count >12,000/µL, <4000/µL or >10% band forms. Radiographic contrast nephropathy was defined as either a 25% increase in SCr or an absolute increase in SCr of 0.5 mg/dL within 24 h of the procedure. Obstruction was attributed to cause of CAAKI if there was radiological evidence and improvement in renal function after relief of obstruction. Hepatorenal syndrome was defined as the cause of AKI if patients with liver failure, developed AKI in the absence of any other apparent cause, including shock, current, or recent treatment with nephrotoxic drugs, and the absence of ultrasonographic evidence of obstruction or parenchymal renal disease, the urine red cell excretion of <50 cells per high-power field, protein excretion <500 mg/day and when there was no improvement in renal function after volume expansion with intravenous albumin, 1 g/kg of body weight/day up to 100 g/day, for at least two days and withdrawal of diuretics. Acute tubular necrosis (ATN) was considered when renal functions did not improve after correction of possible pre-renal causes and when hepatorenal syndrome and vascular, interstitial, glomerular, and obstructive etiologies were ruled out. Acute glomerulonephritis was considered in a case with histological confirmation except for acute postinfectious state with clinical and biochemical markers substantiating the diagnosis. Acute tubulo-interstitial nephritis was considered when there was a high degree of clinical suspicion or histological demonstration. All patients were followed with daily Cr values until the day of discharge and three-month postinjury. KDIGO stage was assigned as per elevated Cr value or decrease in urine output, whichever was more severe. We classified patients according to the maximum stage (Stage 1, Stage 2, or Stage 3) reached during their hospital stay. Outcomes were classified as complete recovery of renal function, partial recovery, and dialysis-dependent and in-hospital mortality. Complete recovery was defined as decrease in SCr to <1.2 mg/dL along with improvement in urine output during the hospital stay. Partial recovery of renal function was defined as the improvement in renal function but with SCr levels still >1.2 mg/dL at the time of discharge from the hospital. Dialysis dependent were those who remained on dialysis after 12 weeks of kidney injury.

Statistical Analysis

The data for the study were collected in predesigned format. The data collected for the
study were edited for completeness and consistency and entered in the Microsoft Excel spreadsheet. Statistical analysis was carried out using IBM SPSS Statistics for Windows version 20.0 (IBM Corp., Armonk, NY, USA). A descriptive analysis was performed; Continuous data were presented as mean and standard deviation and categorical data as a percent and 95% confidence interval. At the univariate analysis, proportions were compared between groups using a Pearson Chi-squared test.

**Results**

Of 9800 patients admitted during the two-year period between January 2014 and December 2015, 286 patients (2.9%) were diagnosed to have CAAKI. The mean age of the population was 4.8 ± 17.1 years. One hundred and eighty-four (64.5%) were males, whereas 102 (35.5%) patients were females. The most common cause of CAAKI was medical 221 (77.27%), followed by obstetrical 40 (13.98%) and surgical causes 25 (9%), as depicted in Figure 1.

Volume depletion with hypoperfusion was the most common etiology among medical causes seen in 116 patients (52.48%), of which 72 (62%) were due to acute gastroenteritis (Table 1). Pregnancy-related AKI was seen in 40 cases (13.98%), puerperal sepsis was the most common cause of obstetric CAAKI seen in 21 of 40 patients (52.5%), followed by pre-eclampsia in eight (20%), hemorrhage in seven (17.5%), and thrombotic microangiopathy (TMA) in four patients (10%). Among the surgical causes of CAAKI, nephrolithiasis was the most common etiology presenting with obstruction and acute renal failure. The “histological diagnosis” of all 286 patients was analyzed.

Twenty-nine patients underwent renal biopsy during their hospital stay (Table 2).

The most common indication for renal biopsy in our population was the absence of an obvious cause for CAAKI, persistent renal failure and extra-renal manifestations suggesting underlying systemic disease. In the patients who did not undergo renal biopsy, a “probable” histological diagnosis was assigned based on the patient’s history, clinical findings, laboratory investigations, and hospital course. When the histological diagnosis (biopsy diagnosis or “probable” histological diagnosis) was analyzed; ATN was found to be the most frequent cause of CAAKI. Hypovolemia was the most common precipitating factor for ATN.
However, in the patients who underwent a renal biopsy, acute interstitial nephritis (AIN) was the most common diagnosis. Drugs were the most common etiological agents of AIN. Of the 17 episodes, analgesics were the cause in 10 patients, and the remaining were due to antibiotics (aminoglycoside - 4, ampicillin – 2, and cotrimoxazole - 1). TMA needs a special mention as it presents interesting diagnostic challenges in adults with AKI. These disorders at presentation are often misdiagnosed as sepsis, complicated malaria, HELLP syndrome, or anti-phospholipid antibody syndrome.

Complicated malaria often presents with fever, thrombocytopenia, renal failure, and neurological symptoms mimicking HUS and thrombotic thrombocytopenic purpura (TTP). Often, renal biopsy is needed to confirm the diagnosis when other laboratory parameters are equivocal. The disease needs to be identified because of its favorable response to the early initiation of plasma exchange. Of the four patients who had a diagnosis of TMA on renal biopsy, three had a clinical diagnosis of HUS, and one had a diagnosis of TTP. Twelve percent (36 patients) had icterus, 9% (26 patients) had encephalopathy and 42% (120 patients) were oliguric at presentation. The mean duration of hospital stay was 38.8 ± 19.3 days. Thirteen percent (40 patients) required intensive care; 16% (48 patients) needed mechanical ventilation during their hospital stay. Dialysis was indicated in 52% (150 patients). Of the 150 patients, 54% (81 patients) underwent conventional hemodialysis (HD), 43.3% (65 patients) sustained low efficiency dialysis (SLED), while 2.6% (4 patients) underwent peritoneal dialysis (PD). The vascular access used was femoral venous catheter in 6.8% (10 patients) and internal jugular access in 93.15 % (136) of the dialysis sessions.

All patients were classified as per the KDIGO, as depicted in Table 3; 3% (10 patients) were in Class I, 22% (64 patients) were in Class II, and 74% (212 patients) were in Class III. The outcome was good in Class I and II.

There was complete recovery of all the

| Table 1. Etiology and management of community acquired acute kidney injury. |
|-------------------------------------------------------------|
| **Etiology** | **Number of patients (n (%))** | **Need for dialysis (n)** | **Mortality (n)** |
|-----------------|-------------------------------|-------------------------|-----------------|
| Medical         | 221 (77.27)                   | 110                     | 51              |
| Volume depletion and hypoperfusion | 116 (52.48)             | 45                      | 23              |
| Diarrheal disease | 72 (62)                        | 13                      | 3               |
| Cardiac failure | 15 (12.9)                      | 9                       | 4               |
| Chronic liver failure | 12 (10.3)               | 8                       | 4               |
| Burn            | 9 (7.75)                       | 8                       | 6               |
| Pancreatitis    | 8 (6.89)                       | 7                       | 6               |
| Sepsis          | 59 (26.69)                     | 48                      | 26              |
| Acute glomerulonephritis | 18 (8.14)            | 6                       | 0               |
| Drugs           | 17 (7)                         | 4                       | 0               |
| Malaria         | 10 (4.5)                       | 6                       | 2               |
| Snake bite      | 1 (0.45)                       | 1                       | 0               |
| Obstetrics      | 40 (13.98)                     | 25                      | 4               |
| Surgical        | 25 (9)                         | 15                      | 3               |

| Table 2. Renal histology in community acquired acute kidney injury. |
|-----------------------------|-----------------|
| **Biopsy diagnosis** | **n (%)** |
| Acute tubulointerstitial nephritis | 10 (34.4) |
| Acute tubular necrosis       | 7 (24.2)     |
| Acute glomerulonephritis     | 6 (20.68)    |
| Thrombotic microangiopathy   | 4 (13.79)    |
| Acute cortical necrosis      | 2 (6.8)      |
patients of Class I and the highest mortality was seen in Class III patients. Only 169 patients (59%) had complete recovery of renal function, 37 patients (13%) had partial recovery of renal function and 22 (8%) were discharged on long-term RRT. The overall in-hospital mortality among patients with CAAKI was 20% (Figure 2).

In comparison with survivors, factors associated with increased in-hospital mortality (<0.05) are depicted in Table 4.

**Discussion**

Geographical, etiological, cultural, and economic differences determine dissimilarities among many characteristics of AKI in different regions of the world. Differences of the true epidemiological characteristics of CAAKI have been hampered by the lack of a generally

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**Table 3. Kidney Disease Improving Global Outcomes classification and its association with mortality.**

| Stage       | n (%)       | Mortality, n (%) |
|-------------|-------------|------------------|
| KDIGO I     | 10 (3.7)    | 0                |
| KDIGO II    | 64 (22.6)   | 4 (6.25)         |
| KDIGO III   | 212 (74)    | 54 (25.4)        |

KDIGO: Kidney Disease Improving Global Outcomes.

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**Table 4. Factors associated with in-hospital mortality in community acquired acute kidney injury.**

| Parameter                      | Survivors | Nonsurvivors | P   |
|--------------------------------|-----------|--------------|-----|
| Mean age (years)               | 45.8      | 50.2         | NS  |
| Hospital stay (days)           | 34.1      | 42.1         | NS  |
| Mechanical ventilation (%)     | 7.9       | 21.5         | <0.01|
| Hemoglobin <10 g/dL (%)        | 15.9      | 46.4         | <0.01|
| Serum albumin <3.5 g/dL (%)    | 19        | 48           | <0.01|
| Serum creatinine >4 mg/dL (%)  | 15.9      | 46.3         | <0.01|
| Hypotension at presentation (%)| 32        | 67.2         | <0.01|
| Oliguria (%)                   | 56        | 74           | <0.01|
| Encephalopathy (%)             | 6.8       | 22.2         | <0.01|
| Co-existing liver disease (%)  | 3.4       | 11.1         | 0.04|
accepted definition of AKI. Difficulties also arise because of variation in the catchment population and the method used for case ascertainment. Taking into account these issues, the aim of this article is to study the clinical profile and outcome of CAAKI from central India; this is the first such study on AKI from central India.

Ever since the introduction of the term “acute renal failure” by Homer W. Smith in 1951, at least 35 different definitions have been used to identify the syndrome. The incidence varies from 1% to 31%, and mortality ranges from 28% to 82% depending on the definition used. KDIGO in 2012 has defined AKI as an absolute increase of SCr of >0.3 mg/dL. The same definition has been used by us to diagnose CAAKI in our patients; 2.9% of patients admitted to the nephrology department of our hospital had a diagnosis of CAAKI. The mean age of the population admitted with CAAKI was 48 years. Only 9.1% were >60 years of age. Although this may be reasoned by the shorter life expectancy in the Indian population, it also implies the occurrence of CAAKI in the younger age-group as compared with developed countries. In a country like India, where access to healthcare insurance is limited, CAAKI in the middle-aged population creates a huge economic burden on families. Medical causes accounted for about 75% of CAAKI. Diarrheal diseases, malaria, and sepsis contribute to 49.3% of CAAKI. Diarrheal diseases still continue to be the most common cause of CAAKI in our population. Shield et al reported that Escherichia coli and Salmonella are the most common etiological agents in this region, with seasonal occurrences of Vibrio cholera. Although the incidence of diarrheal disease-related acute renal failure has decreased from 23% in the 1960s to <10%, diarrheal diseases still continue to be a major cause of CAAKI necessitating emergency dialytic therapy. India contributes 80% of all the cases of malaria in Southeast Asia. The prevalence of AKI in malaria is <1%, but increases to 60% in severe infections. Although falciparum infections remain the most common cause of complicated malaria, various Indian investigators have documented the increasing incidence of complicated malaria in P. vivax infections. Twenty percent (two of 10) of our patients with malaria-associated AKI had P. vivax infection; in contrast, 6.25% of malarial AKI follows P. vivax infections in southern India. This could indicate an increasing incidence of vivax malaria in our population or a rising rate of AKI in P. vivax infections. Sepsis had the highest in-hospital mortality of 44%, which is similar to data from other Indian centers. Worldwide, the incidence of sepsis-related AKI is increasing and represents an independent risk factor for in-hospital mortality in these patients. Pregnancy-related AKI comprise 95% to 25% of nephrology referrals in developing countries as compared with 1%–2.8% in the developed world. In Northern India, the incidence of obstetric AKI decreased from 22% in the 1960s to 10% in the 1980s and since then, the incidence of obstetric AKI has remained fairly constant, between 10% and 15%. However, significant improvement in maternal mortality has been achieved. Maternal mortality has decreased from 20% in the 1980s to 6.4% in the 1990s. Obstetric AKI contributed to 13.98% of CAAKI in our population and had 10% mortality. The lower mortality at our center as compared to the study done by Kaul et al, in which the mortality in the obstetric group was 36%, may be due to the early diagnosis of sepsis and AKI and timely referral to nephrologists. Nine percent of CAAKI was due to surgical causes. Nephrolithiasis was the most common cause. Renal stone disease in the Indian population is different from that in Western countries, with a larger percentage of patients having calcium oxalate stones. Previous studies from north India have found calcium oxalate monohydrate as the major component of stones, with hyperoxaluria and hypocitraturia being the most common urinary abnormalities. Dietary factors, inherited metabolic disorders and fluid losses contribute to the increased incidence of nephrolithiasis in the Asian population. Five of the 25 patients with surgical AKI had obstructive uropathy due to
carcinoma cervix presenting as AKI. Such complications are not uncommon in the Indian population, and indicate the need for improved screening covering the widest possible population and also regular follow-up of women with precancerous lesions.\textsuperscript{31,32} In southern India, snake bite causes 7.8\% of AKI and copper sulfate poisoning contributes to 4.7\% of AKI.\textsuperscript{16} In our study, one patient had snake bite induced AKI out of 286 patients with CAAKI. This patient developed cortical necrosis and finally landed into dialysis-dependent chronic kidney disease. The reason we found for such a dreaded outcome was delay in getting anti-snake venom, patient was first taken to the local nonmedical traditional practitioner. Another significant trend is the increasing incidence of leptospirosis related AKI in northern India. In our study, none of the patients had leptospirosis as the cause of AKI, although Sethi et al have demonstrated an increasing incidence of leptospirosis in northern India from 11.5\% in 2004 to 20.5\% in 2008. Sixty percent of the 86 cases included in their study had AKI.\textsuperscript{10} Histology helps in diagnosis, predicting disease course and outcomes. Twenty-nine patients (10\%) with CAAKI underwent renal biopsy; 34.4\% had AIN, followed by ATN in 24.2\%. In comparison, Liano et al\textsuperscript{33} biopsied 6.15\% of patients with AKI observed AIN in 8.6\%, ATN in 8.6\% and glomerular diseases in 39\%. The higher percentage of AIN seen is due to the easy availability of over-the-counter medications and frequent use of drugs from alternate systems of medicine. In AKI, the most useful role of kidney biopsy is early detection of glomerular diseases, as it helps to plan therapy and to estimate prognosis. The percentage of glomerular disease and TMA are equal in many studies. This is because patients with classical postinfectious glomerulonephritis were not biopsied. TTP and HUS are disorders characterized by fever, Coomb’s-negative microangiopathic hemolytic anemia, thrombocytopenia, and systemic ischemia and multiple organ failure.\textsuperscript{34-36} In Asia, HUS is responsible for 25\% to 55\% of pediatric AKI.\textsuperscript{37-39} Although \textit{E. coli} O157:H7 is the most common cause in many parts of the world, Shigella is the primary etiological agent in the Indian population\textsuperscript{7} and has poor outcomes with a mortality rate of 60\%. Literature on the choice of dialytic modality is conflicting and no study has conclusively demonstrated the appropriate type and dose of RRT in AKI.\textsuperscript{40} In India, the use of CRRT as a dialytic modality is increasing with the availability of advanced equipment and bicarbonate replacement solutions. When the choice of dialytic modality in our center was analyzed, decreasing anticoagulation, reducing cost and improving patient mobility were the major reasons to choose SLED over CRRT. Acute PD was used in 2.6\% of the patients. Although HD has become the preferred dialysis modality in many centers, PD, because of easy availability and cost benefits, remains the major dialytic modality in many Indian hospitals. Hayat et al\textsuperscript{41} reported a survival rate of 90\% in adult AKI patients of northern India who underwent PD. Gabriel et al\textsuperscript{42} have recently suggested that PD was associated with more rapid renal recovery in AKI. PD can also be used as a bridge, thereby avoiding the use of central venous catheters, which can be associated with infectious complications such as bacterial endocarditis.\textsuperscript{43} The overall in-hospital mortality among patients with CAAKI was 20\%. Sepsis had the highest in-hospital mortality. Indian studies on CAAKI have reported a mortality of 16\% to 26\%.\textsuperscript{44} As compared with hospital-acquired AKI, the lower mortality rate in CAAKI is probably due to the higher percentage of diarrheal disease and younger age-group of our population. Instead, this could also imply a trend toward better survival in AKI. In the volume depletion group the worst prognosis was seen in burns-associated AKI as also described by Ibrahim et al.\textsuperscript{45} In our study population, 15\% of the patients were discharged on RRT. Complete recovery was seen in 169 patients (59\%). Among survivors of AKI, at short-term follow-up (3 months), approximately 8\% are dialysis dependent and 13\% had partial recovery.\textsuperscript{46} Even in patients who do not require dialysis, AKI is associated with increased long-term mortality risk, inde-
ependent of their residual kidney function.\textsuperscript{47} When survivors and nonsurvivors were compared, need for assisted ventilation during the course of hospitalization, presence of encephalopathy, hypotension, oliguria, hemoglobin levels <10 g/dL at the time of admission, SCr >4 mg/dL, serum albumin <3.5 mg/dL and coexisting liver disease were associated with increased in-hospital mortality. In comparison, Liaño and Pascual\textsuperscript{33} in the largest epidemiological study of 748 acute renal failure patients identified presence of oliguria, sustained hypotension, assisted respiration, jaundice, sedation, or coma as risk factors of mortality.

**Conclusions**

CAAKI remains a common problem affecting 2.9% of patients in the nephrology unit. Volume depletion with hypoperfusion, infections, and obstetric causes lead to the majority of CAAKI episodes. HD is the preferred treatment modality. In India, the use of SLED and CRRT in the management of CAAKI is increasing. The outcome is better if AKI is timely diagnosed. For early diagnosis of renal damage and reducing the risk of progression, patients should be referred to nephrologists early in the course of kidney injury.

**Conflict of interest:** None declared.

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