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Adult Patients with Acute Kidney Injury often present to the Emergency Department of a Tertiary Care Hospital to analyze their Clinical Profile

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Abstract:

Objective: *To examine the clinical presentation, treatment regimen, and end results of adult cases of acute kidney injury admitted to the emergency department of a tertiary care hospital.*

Material and Methods*: In this Cross sectional study in the emergency department for duration of Six months, from January 2022 to Jun 2022 a total of 306 patients were included. Patients with creatinine levels >1.4 with no previous knowledge of kidney disease were diagnosed with Acute kidney injury unless their renal ultrasound showed chronicity. The clinical presentations of patients in the emergency department were observed. A chi-square test was applied and P-value of <0.05 was considered significant.*

Results: *Within our analysis, 52.9% of the subjects were male, and 47.1% were female. The majority of patients presented with decreased urine output (76.5%), fever (73.9%), drowsiness (41.2%), shortness of breath (40.5%), confusion (60.8%), and fatigue (37.9%). Additionally, a smaller percentage experienced chest pain (11.8%), diarrhea (22.2%), edema (5.9%), nausea (2.6%), and seizures (17.6%). Weight gain was reported by 13.7% of patients, oliguria/anuria by 77.1%, back pain by 10.5%, anorexia by 64.7%, vomiting by 55.6%, and seizures by 3.3%.*

Conclusion: *The most common problem reported was a reduction in urine output. Oliguria/anuria was the most prevalent concern, followed by back pain. A significant number of patients were admitted for further management.*

Keywords: acute kidney injury, anorexia, Oliguria/anuria, Seizures.

INTRODUCTION

Acute kidney injury (AKI) has long been recognized as a severe and devastating disorder.[1] Acute renal injury is identified by the abrupt impairment of kidney function, resulting in the inability to sustain fluid, electrolyte, and acid-base homeostasis.[2] Historically, AKI has been viewed as a victim, merely echoing the presence of other medical conditions. However, recent research has shed light on AKI's autonomous role as a risk factor for mortality.[3] In the United Kingdom, fatality rates have been noted to peak at 40%.[4] The risk factors identified consist of advanced age, hospitalization, diabetes, hypertension, liver disease, prior kidney disease, and the use of certain medications. The most common presenting symptom was oliguria (86.1%), followed by edema (58.9%), encephalopathy (49%), and convulsions (11.3%).[5] The most common causes of AKI, characterized by loose stool or emesis, were hypovolemia (22.5 percent) and GI fluid loss. AGN (21.9%) and pregnancy-related complications (18.5%) were also

significant contributors to the development of AKI.[5] The Risk, Injury, Failure, Loss, and End-stage Renal Disease classification (RIFLE) has been utilized by the Acute Dialysis Quality Initiative to establish a consensual definition for acute kidney injury.[6] Extensive re-evaluation of acute renal failure has taken place in recent years.[7] Most acute severe kidney function reductions as shown by severe azotemia and, frequently, oliguria or anuria were highlighted.[5] However, new studies propose that even minor injury or impairment of kidney function, as evidenced by slight increases in serum creatinine (sCr) and/or urine output, may result in renal failure. [7], predicts serious clinical consequences.[8]

The RIFLE classification system categorizes AKI into five escalating stages (risk, injury, failure, loss, and end-stage renal disease) according to either a rise in serum creatinine levels or a reduction in urine output over time.[9]

A diverse population in terms of ethnicity, socioeconomic status, and developmental stage.[10] other studies have been conducted in Asia demonstrating the association between AKI and factors such as cardiac surgery and sepsis. However, to date, there has been no reliable study on the prevalence of AKI in patients to the emergency department.[11]

To facilitate discussions regarding the harmful consequences of AKI, the Acute Disease Quality Initiative Workgroup introduced the term acute kidney disease (AKD). According to Kidney Disease: Improving Global Outcomes (KDIGO), AKD is defined as the persistence of stage-1 AKI criteria for more than 7 days following an AKI-initiating event. KDIGO also highlights crucial interventions that can impede or slow down the progression of renal disease, while identifying populations at risk of chronic kidney disease (CKD), cardiovascular events, and mortality. Hence, the objective of this study is to examine the clinical profile of adult patients with Acute Kidney Injury (AKI) who present to the Emergency Department of a Tertiary Care Hospital.

METHODOLOGY

In this Cross sectional study in the emergency department for duration of Six months, from January 2022 to Jun 2022 a total of 306 patients were included. Patients with creatinine levels >1.4 with no previous knowledge of kidney disease were diagnosed with Acute kidney injury unless their renal ultrasound showed chronicity. The clinical presentations of patients in the emergency department were observed. A chi-square test was applied and P-value of <0.05 was considered significant. The sample size was calculated given a margin of error of 0.5 and a confidence level of 95% with a 22.6% prevalence of seizure.

RESULTS

In sociodemographic data 52.9% of the patients being males and 47.1% were female. The overall mean patient age was 47.35±14.22 years. The median of which was 51.00, range 45 and minimum age 19 years and maximum 64 years.

It was observed that 43.1% of the patients were housewives are presented in Fig 1.

In our study, 76.5% of patients presented to the emergency department with decreased urine output, 73.9% with fever, 41.2% with drowsiness, 11.8% with chest

pain, 22.2% with diarrhea, 5.9% with edema, 40.5% with shortness of breath, 37.9% with fatigue, 60.8% with confusion, 2.6% with nausea, and 17.6% with seizures, as presented in Fig 2.

In terms of signs and symptoms, 13.7% of patients had weight gain, 77.1% had oliguria/anuria, 10.5% had back pain, 64.7% had anorexia, 55.6% had vomiting, and 3.3% had seizures. A detailed frequency distribution of the signs and symptoms is presented in Fig 3.

The overall mean symptom duration was 4.28±3.20 days. Most of the patients (41.8%) had history of HTN. Additionally, (28.1%) had DM, (5.9%) Hepatitis-B/CLP/hepatoma, (5.2%) Ischemic heart disease, (3.3%) chronic liver disease, (2.6%) S/P appendicectomy, (10.5%) with miscellaneous conditions and (2.6%) with no medical or surgical history.

The on-arrival overall mean hemoglobin, blood urea nitrogen, creatinine, sodium, potassium, calcium, and estimated glomerular filtration rates were 11.20±2.52 units, 34.56±22.55 units, 2.86±1.88 units, 130.48±8.34 units, 4.34±1.10 units, 8.50±1.73 units, and 28.27±11.70 units, respectively. The detailed descriptive statistics of on-arrival mean blood urea nitrogen, among 153 patients, 96.1% were treated with IV fluids and 3.3% with emergency dialysis, and 73.2% were admitted to inpatient services, as presented in Table 1&2.

Most of the patients were diagnosed with urinary tract infection (28.8%) and acute kidney injury (21.6%). A detailed frequency distribution of the diagnoses is presented in Table 3.

Stratification with respect to gender, age group, diabetes mellitus, hypertension, and ischemic heart disease was conducted to observe the effects of these modifiers on clinical presentation in the emergency department (decreased urine output, fever, drowsiness, chest pain, diarrhea, edema, shortness of breath, fatigue, confusion, nausea, and seizures). P-values ≤0.05 were considered significant. The detailed results of these associations are presented in Tables 4 & 5.

DISCUSSION

Acute kidney injury is a common illness that may present with the use of nonsteroidal anti-inflammatory drugs and with multiple comorbidities, including diabetes, hypertension, ischemic heart disease, stroke, infectious causes (e.g.,diarrhea, HIV, malaria, glomerulonephritis, urinary tract infection), rheumatoid arthritis, SLEpregnancy-related conditions, hypovolemia, and contrast-induced nephropathy.

The goal of this study was to assess the objective descriptions of elder subjects who reported to an emergency department with a high blood creatinine level. The patients were between the ages of 20 and 70, with an average age of 48.1 years, which is lower than Bernie B, et al findings.In our study, the mean patient age was 47.35±14.22 years.[1]

The most prevalent clinical symptoms, according to one study, were vomiting (92 percent), oliguria (80 percent), exhaustion (72%) and fever (70%).[13] Hypotension, edoema, and jaundice were found in 30 percent, 28 percent, and 24 percent of patients, respectively, on physical examination. The majority of the findings were in line with earlier research. Fever was found in 70% of patients in one research, which might be due to the greater prevalence of AKI linked with infections such as malaria, leptospirosis, and acute GE[14]. In our study, among 153 patients, 76.5% presented to

the emergency department with decreased urine output, 73.9% with fever, 41.2% with drowsiness, 11.8% with chest pain, 22.2% with diarrhea, 5.9% with edema, 40.5% with shortness of breath, 37.9% with fatigue, and 60.8% with confusion.

In one study, 12 percent of patients had AKI as a result of medication toxicity. Aminoglycosides and nonsteroidal anti-inflammatory medications (NSAIDs) were the most commonly used offending pharmaceuticals. One patient had lithium-induced AKI, while another had taken herbal medication.[15] Except for the patient who had been using lithium, all of the individuals had normal renal function after stopping the offending medicine. Drug-induced nephrotoxicity was seen in the older age range in this investigation, and all these individuals had pre-morbid problems.

Some studies in southeastern Africa showed a high incidence of 17.2% and mortality rates of up to 44.4% in inpatients with impaired renal function.[16] Multiple studies have shown that acute renal failure causes high morbidity and mortality, prolonged hospital admission, and increased health costs. The exact etiology of AKI remains a core topic for researchers.[17]

According to the World Health Organization (WHO), malaria affects 1–4% of adults depending on some disease-endemic areas.[18] The association between AKI and malaria is well understood; it may be due to insensible fluid losses from pyrexia, fluid loss through vomiting, kidney hypo perfusion from vasodilation, and direct renal injury from antimalarial therapy[19]. Fortunately, kidney injury due to malaria is reversible.
Studies from low- and middle-income countries show that pregnancy-associated renal failure often requires renal replacement therapy and is a leading cause of mortality among young women in underdeveloped countries.[18]

CONCLUSION

AKI is of great significance among the clinical syndromes associated with poor clinical outcomes for subjects presented. Our study findings indicate that most of these patients were hypertensive. Decreased urine output was the most prevalent complaint, followed by fever. Oliguria/anuria was observed more, followed by back pain, anorexia, vomiting, and seizures. Most of the patients were admitted.

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Figure 1: Frequency distribution of occupation (n=306)

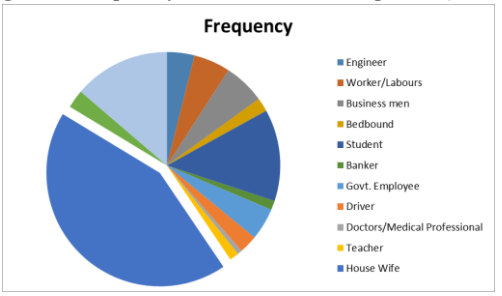

Fig 2: Distribution of clinical presentations in the emergency department (n=306)

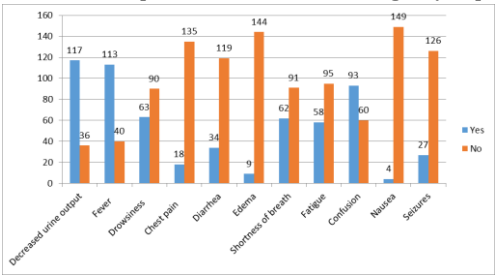

Fig 3: Signs and symptoms of the Patients (n=306)

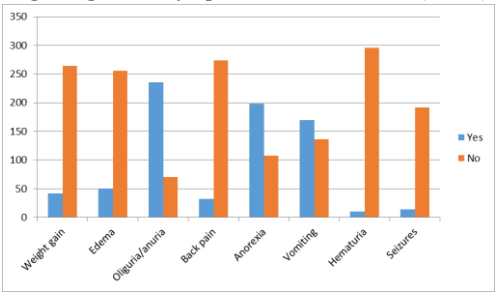

Table 1: Descriptive statistics of BUN, Cr, and estimated glomerular filtration rate on arrival (n=306)

	BUN	Cr	eGFR
Mean	34.56	4.98	28.27
SD	22.55	2.88	11.70
Median	30.00	2.10	32.00
Range	127	11.1	54.9
Minimum	2`	1.5	3.4
Maximum	262	24.12	58.3

Table 2: Frequency distribution of management (iv fluid or emergency dialysis) (n=306)

	IV Fluid Frequency (%)	Emergency HD Frequency (%)
Yes	294 (96.1)	10 (3.3)
No	12 (3.9)	296 (96.7)
TOTAL	306	306

Fig 4: Frequency distribution of diagnoses (n=306)

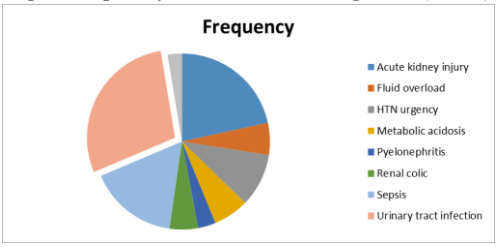

Table 4: Frequency of diarrhea according to gender, age, diabetes mellitus, hypertension and ischemic heart disease (n=306)

		DIARRHEA		TOTAL	P-Value
		Yes	No		
Gender	Male	40 (24.7)	122 (75.3)	162	0.436**
	Female	28 (19.4)	116 (80.6)	144	
Age group	≤50 years	42 (27.6)	110 (72.4)	152	0.110**
	>50 years	26 (16.9)	128 (83.1)	154	
Diabetes mellitus	Yes	26 (18.8)	112 (81.2)	138	0.362**
	No	42 (25)	126 (75)	168	
Hypertension	Yes	30 (17.4)	142 (82.6)	172	0.107**
	No	38 (28.4)	96 (71.6)	134	
Ischemic heart disease	Yes	10 (16.7)	50 (83.3)	60	0.414**
	No	58 (23.6)	188 (76.4)	46	

Table 5: Frequency of fever according to gender, age, diabetes mellitus, hypertension, and ischemic heart disease (n=306)

Variable		FEVER		TOTAL	P-Value
		Yes	No		
Gender	Male	116 (71.6)	46 (28.4)	162	Not Significant
	Female	110 (76.4)	34 (23.6)	144	

Age group	≤50 years	102 (67.1)	50 (32.9)	152	0.059**
	>50 years	124 (80.5)	30 (19.5)	154	
Diabetes mellitus	Yes	104 (75.4)	34 (24.9)	138	Not Significant
	No	122 (72.6)	46 (27.4)	168	
Hypertension	Yes	124 (72.1)	48 (27.9)	172	Not Significant
	No	102 (76.1)	32 (23.9)	134	
Ischemic heart disease	Yes	44 (73.3)	16 (26.7)	60	Not Significant
	No	182 (74)	64 (26)	246	