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# Clinical Presentation of Renal Injury at a Tertiary Care Hospital

**Cijo John[1], Selin Abraham[1]**

**Author's Affiliation:**
[1]Assistant Professor, Department of Medicine, Mount Zion Medical College, Chayalode, door Pathanamthitta, Enadimangalam, Kerala 691556, India.

**Corresponding Author:**
**Selin Abraham,**
Assistant Professor, Department of Medicine, Mount Zion Medical College, Chayalode, Adoor Pathanamthitta, Enadimangalam, Kerala 691556, India.
E-mail: sowmyatshassan@gmail.com

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**Abstract**

*Introduction:* AKI occurs predominantly in urban intensive care units and is associated with multiorgan failure and sepsis, high mortality, and occurrence in older populations. While cases of AKI in urban areas of the developing world have similar characteristics to those in the developed world, AKI in rural regions commonly develops in response to a single disease and specific conditions (e.g. gastroenteritis) or infections (e.g. severe malaria, leptospirosis, or hemolytic–uremic syndrome) and in younger otherwise healthy individuals. *Methodology:* Acute Kidney Injury,the major inclusion and exclusion criteria were identified. Data regarding etiology,clinical features, outcome to treatment were collected over a period of one year from Jan 2011 to Jan 2012 in total of 200 admitted patients. The outcome of the study was analyzed and documented. *Results:* The youngest person enrolled was 20 yrs and oldest was 86 yrs of age.Amongst the pre renal conditions Acute diarrheal diseases are the commonest. Oliguria dominate as the most common presenting symptom in patients with AKI. *Conclusion:* Acute kidney Injury is commonly seen in men than in women below the age group of 50 yrs.

**Keywords:** Acute Renal Failure; Glomerulonephritis; AKI.

## Introduction

The evolution of the term 'acute renal failure' dates back to 1802, when William Heberden first described it as *IschuriaRenalis*. Since then there are over 35 official definitions of the term; these include: *Acute Bright's disease, war nephritis andcrush syndrome.*It wasn't until 1951 that Homer W. Smith introduced the term 'Acute Renal Failure' [1].

Today, Acute Kidney Injury (AKI) is considered the correct nomenclature for the clinical disorder formerly termed 'Acute Renal Failure'(ARF). AKI, is a protean syndrome of varied severity. It is characterized by a rapid (hours to days) decline in the glomerular filtration rate (GFR) and retention of nitrogenous waste products such as blood urea nitrogen (BUN) and creatinine. Acute kidney injury (AKI) has become increasingly prevalent in both developed and developing countries, and is associated with severe morbidity and mortality [2].

In developed countries, AKI occurs predominantly in urban intensive care units and is associated with multiorgan failure and sepsis, high mortality, and occurrence in older populations. While cases of AKI in urban areas of the developing world have similar characteristics to those in the developed world, AKI in rural regions commonly develops in response to a single disease and specific conditions (e.g. gastroenteritis) or infections (e.g. severe malaria, leptospirosis, or hemolytic–uremic syndrome) and in younger otherwise healthy individuals. Many causes of AKI in rural settings, such as diarrhea, poisoning, malaria, or septic abortion, can be prevented by interventions at the individual, community, and regional levels. Treatment with dialysis is often unavailable or too costly in developing regions, so there must be community-wide efforts to eradicate causes of AKI, expedite diagnosis, and aggressively manage prerenal conditions and specific infections [3].

Despite several advances in our treatment and understanding of the pathogenesis of acute kidney

injury (AKI), many aspects in this field remain subject to controversy, confusion, and lack of consensus. One of these important aspects is the definition of AKI. To make consensus-based recommendations and delineate key questions for future studies,the Acute Dialysis Quality Initiative (ADQI) workgroup identified a definition/classification system for AKI [4].

Accordingly, a multilevel classification system was proposed, in which the complete spectrum of acute renal dysfunction could be included, such as Risk of renal dysfunction, Injury to the kidney, Failure or Loss of kidney function, and End-stage kidney disease; these criteria are identified by the acronym RIFLE. The RIFLE criteria were later modified and referred to as the acute kidney injury network (AKIN) definition.For all practical purposes, RIFLE and AKIN criteria are the same.The aim of this study is to summarize the clinical profile of AKI as defined by the RIFLE/AKIN criteria but limited by the inability to define the baseline creatine and GFR levels [5].

## Methodology

This study was conducted on admitted patients in the Department of Medicine, and was aimed at identifying the more common causes, clinical features and outcome of treatment of these patients admitted with Acute Kidney Injury above 18 yrs of age. Approval from ethical committee and written consent from patients or his/her relatives were obtained.

Acute Kidney Injury, the major inclusion and exclusion criteria were identified. Data regarding etiology, clinical features, outcome to treatment were collected over a period of one year from Jan 2011 to Jan 2012 in total of 200 admitted patients. The outcome of the study was analyzed and documented.

*Inclusion Criteria*

1. Patients admitted in the Department of Medicine,T.D Medical College, Alappuzha.
2. Patients above 18yrs of age.
3. Both sex included.
4. Clinical and Lab values suggestive of Acute Kidney Injury.

*Eeclusion Criteria*

1. Patients below 18yrs of age.
2. Already diagnosed cases of Chronic kidney disease.

## Results

The youngest person enrolled was 20yrs and oldest was 86yrs of age.

**Table 1:** Sex and Age distribution

| Age | Gender | | Total |
|---|---|---|---|
| | Male | Female | |
| 18 - 27 | 9 | 5 | 14 |
| | 8.00% | 5.70% | 7.00% |
| 28 - 37 | 24 | 14 | 38 |
| | 21.40% | 15.90% | 19.00% |
| 38 - 47 | 23 | 13 | 36 |
| | 20.50% | 14.80% | 18.00% |
| 48 - 57 | 27 | 34 | 61 |
| | 24.10% | 38.60% | 30.50% |
| 58 - 67 | 21 | 17 | 38 |
| | 18.80% | 19.30% | 19.00% |
| 68 - 77 | 5 | 5 | 10 |
| | 4.50% | 5.70% | 5.00% |
| 78 - 87 | 3 | | 3 |
| | 2.70% | | 1.50% |
| Total | 112 | 88 | 200 |

Chi Square: 8.012; P > 0.05

**Table 2:** Gender distribution between Age groups

| Age | Gender | | Total |
|---|---|---|---|
| | Male | Female | |
| < 50 yrs | 62 | 44 | 106 |
| | 55.40% | 50.00% | 53.00% |
| >= 50 yrs | 50 | 44 | 94 |
| | 44.60% | 50.00% | 47.00% |
| Total | 112 | 88 | 200 |

Chi Square: 0.568; P > 0.05

Most patients presented with oliguria as the main symptom.

**Table 3:** Presenting complaints

| Presenting Complaints | Frequency | Percent |
|---|---|---|
| None | 68 | 34.0 |
| Oliguria | 99 | 49.5 |
| Anuria | 33 | 16.5 |
| Total | 200 | 100 |

**Table 4:** Age wise distribution of presenting complaint

| Presenting Complaints | Age | | Total |
|---|---|---|---|
| | < 50 yrs | >= 50 yrs | |
| None | 45 | 23 | 68 |
| | 42.50% | 24.50% | 34.00% |
| Oliguria | 46 | 53 | 99 |
| | 43.40% | 56.40% | 49.50% |
| Anuria | 15 | 18 | 33 |
| | 14.20% | 19.10% | 16.50% |
| Total | 106 | 94 | 200 |

Chi Square: 7.191; P < 0.05

**Table 5:** Etiology and Frequency

| Diagnosis | Frequency | Percent |
|---|---|---|
| ADD AKI | 34 | 17.0 |
| AGN AKI | 19 | 9.5 |
| CIN | 12 | 6.0 |
| CVA AKI | 9 | 4.5 |
| DIAKI | 12 | 6.0 |
| HUS/TTP | 9 | 4.5 |
| Lepto/AKI | 34 | 17.0 |
| LVF AKI | 10 | 5.0 |
| MM AKI | 5 | 2.5 |
| NSAID AKI | 25 | 12.5 |
| Obst. AKI | 5 | 2.5 |
| Sepsis AKI | 22 | 11.0 |
| Viper Bite | 4 | 2.0 |
| Total | 200 | 100 |

## Discussion

The predominant symptom with which the patients presented was Oliguria (49.5%). 16.5% patients had Anuria as their presenting symptom and 34% of patients did not have either of these symptoms. Oliguria is defined as a urine output that is less than 1 mL/kg/h in infants, less than 0.5 mL/kg/h for six consecutive hours in children and adults, or<400ml/d. The beginning and ending supportive therapy (BEST) kidney investigators highlighted the fact that oliguria was more common in septic AKI and viper bite induced AKI.

It is important to acknowledge, however, that at

least half of all cases of AKI are nonoliguric. This was highlighted by Liano. F, Pascual. M et al in their study on the epidemiology of acute renal failure,in a community based study in Spain. Thus, healthy urine output does not ensure normal renal function. Rarely, ARF comes to the attention of the clinician because of symptoms of uremia (*eg*, anorexia, nausea, vomiting, confusion, pruritus) or laboratory findings compatible with renal failure (metabolic acidosis, hyperkalemia, hyperphosphatemia, hypocalcemia, hyperuricemia, hypermagnesemia, anemia). This finding is also in accordance with the above studies.

It was also observed that oliguria was the predominant symptom in age group above 50 yrs. 56.40% of patients above the age of 50 counted oliguria as their predominant symptom. This finding was statistically significant $P<0.05$. This finding might be due to the fact that kidneys give up early as a fall in GFR as age advances.

The most common cause of AKI in the study was acute diarrheal disease (17%) and leptospirosis induced AKI (17%). NSAID induced AKI was seen in 12.5% and 11% in septic AKI. Combining drug induced AKI and contrast induced AKI accounted for 12%. Acute left ventricular failure induced AKI was seen in 5% of cases. Post renal failure accounted for only 2.5% of the cases of AKI. 59% of the cases could be considered as due to prerenal causes as compared to 38% of AKI due to intrinsic causes. This finding is in accordance with the studies conducted by The Madrid Acute Renal Failure Study Group in 1998.

The male gender incidence in diarrhea associated AKI was (16.1%) and in leptospirosis it was 15.20%, in NSAID and septic AKI, it was similar (10.7%). The females also showed similar incidence (18.2%, 19.3%, 14.8% and 11.4%). The major difference was noted in the incidence of Contrast induced nephropathy,males accounting for 8% as compared to 3% in females. This difference can be attributed to the fact that males are more prone to respiratory and cardiovascular diseases due to various reasons, than females and therefore the need of diagnosis in them with the use of contrast agents.

The incidence of CIN has been reported to range from less than 1% to greater than 30%. This wide variation in incidence is attributed to factors that include wide variability in CM doses, variation in the completeness of timing of patient follow-up, and a likely variation in the patient's hydration state [6].

Patients above the age group of 50 had higher incidence of pre renal failure like ADD associated AKI, CVA causing AKI, NSAID induced and LVF associated AKI (112 patients out of 200) (56%). Septic AKI had an equal distribution among age and gender. Post renal failure was more in the age group more than 50 yrs (100%).CIN was also seen in increased incidence in age group more than 50 yrs (11 cases out of 12) (91%). Elderly patients may be at increased risk for true volume depletion due to changes in body composition with aging, leading to decreased total body water as a fraction of body weight, and from an increased burden of comorbid disease [7]. Non steroidalanti inflammatory drugs (NSAIDs), which are used by approximately 10% to 25% of the elderly [8], inhibit production of vasodilatory prostaglandins. NSAID use has been associated with a threefold higher risk of AKI in the general population, (Huerta et al, 2005), and an absolute risk of prerenal AKI of 13% in a nursing home cohort (mean age 87 years)(French study group on acute renal failure).

Postrenal or obstructive AKI is more common in the aged than in the young [9] accounting for 9% to 30% of cases. The most frequent causes of postrenalAKI in the elderly include benignprostatic hypertrophy (BPH) or prostate cancer, retroperitoneal adenopathy or malignancies, pelvic neoplasms, and neurogenic bladder. Although BPH and prostate cancer are common in older men, they cause obstruction in only a minority of cases. In elderly women, pelvic and retroperitoneal malignancies are the most frequent causes of postrenal AKI [9].

## Conclusion

Acute kidney Injury is more commonly seen in the age group 48-57 yrs and it is increased in incidence in the 38-47 and 58-67 yrs age group.

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