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A Prospective Study of Incidence and Outcome of Acute Kidney Injury Patients Admitted in Medical ICU of Tertiary Care Center

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Abstract
Background: *Acute Kidney Injury (AKI) is characterized by a rapid decline in glomerular filtration rate over hours to days. Before 2004 there more than 35 definitions in medical literature for AKI, so a wide range of incidence estimates for AKI from 1 to 25% of ICU patients and has lad to mortality rate from 15 to 60%.*
Aims and Objectives:*1. To study the association between AKI and death in MICU patients.*
2.To study the age and sex distribution of AKI in MICU patients and their correlation with outcome.
Materials and Methods: *The present study was carried out among patients of MICU of Sanjay Gandhi Hospital Rewa M. P. from January 2015 to December 2017. Total 5412 patients taken out for the study, of which 316 was AKI.*
Results: *The incidence of AKI was 5.8% in MICU and No difference was found between male and female in AKI, death in AKI patient was very high than non AKI patients.*
Conclusion: *the incidence of AKI is nearly 6% in our study and associated with significant mortality than non AKI patients irrespective of age and sex distribution.*
Keywords: *AKI, MICU, outcome.*

Introduction

Acute kidney injury (AKI) is characterized by a rapid decline in glomerular filtration rate (GFR) over hours to days. In medical ICU for purpose of diagnosis and management cause of ARF are generally divided into three major categories:

1. Disease that cause renal hypo perfusion (prerenal AKI) (~55%).
2. Disease that directly involve the renal parenchyma (renal AKI) (~40%).
3. Disease associated with urinary tract obstruction (post renal AKI) (~5%).

The pattern of acute renal failure in India is changing albeit at a slower pace compared to that on developed countries. The most common etiologic factor of AKI in MICU is sepsis

followed by acute diarrhea, malaria (in India), cardiogenic shock and obstructive uropathy.

In 2004 the Acute Dialysis Quality initiative (ADQI) work group set forth a definition and classification system for ARF, described by the acronym RIFLE (Risk of renal dysfunction, Injury to the kidney, Failure or Loss of kidney function, and End stage kidney disease)

Table no. 1 showing various stages of acute kidney disease

Stage	GFR Criteria	Urine output criteria	Probability
Risk	S.Creat. increased×1.5 OR GFR decreased > 25%	UO <0.5 ml/kg/hr.× 6 hrs.	High sensitivity (risk>injury >failure)
Injury	S.Creat. increased×2 OR GFR decreased > 50%	UO <0.5 ml/kg/hr.× 12 hrs.	High sensitivity (risk> injury >failure)
Failure	S.Creat. increased×3 OR GFR decreased > 75% OR S.Creat. ≥4 mg/dl Acute rise ≥ 0.5mg/dl	UO <0.3 ml/kg/hr.× 24 hrs.(oliguria) OR Anuria × 12hrs.	High sensitivity (risk> injury >failure)
Loss	Persistent acute renal failure: complete loss of kidney function > 4 weeks.		High sensitivity
ESKD	Complete loss of kidney function > 3 months		High sensitivity

Material and Methods

The present study was carried out among in patient of MICU of SGMH Rewa from January 2015 to December 2017, over the period of one year. Total 5412 patients have been screened out of which 316 patients of AKI chosen with using standard clinical and laboratory criteria.

Inclusion Criteria

1. Patient admitted in MICU SGMH Rewa,
2. Age more than 15 years,
3. Serum creatinine level should be more than 0.3 mg/dl rise from base line or more than 1.5mg/dl at least one time after admission in MICU.

Exclusion Criteria

1. Age less than 15 yrs,
2. Known case of chronic renal failure,
3. Serum cr. never become more than 1.5mg/dl during admission,
4. Any surgical case of ARF apart from admitted in MICU due to predominantly medical cause.

Diagnostic criteria of AKI:

1. Elevation of serum creatinine should be more than 0.3 mg/dl rise from base line or more than 1.5mg/dl within 48 hr of admission.
2. Reduction in urine output less than 0.5ml/kg/hr for more than 6 hr

Results

The incidence of AKI was 5.8% in MICU. Out of 5412 patients 316 was AKI. The male patient's admission in MICU was higher 61.02 % (3302/5412) than female patients 38.98% (2110/5412). The incidence of AKI was similar in male and female patients 61.02 and 62.1% respectively. Nearly half of the patients (44.91%) admitted in MICU where more than 50 years of age and AKI is also more common (43.98%) in older age patients (>50 yrs.).In adult population (15-30) AKI was more prevalent in female group while in older age group AKI was more common in male. The mortality was significantly higher in AKI group of patients (45.88%) than non AKI group where mortality was only 18.10%.

Figure-1

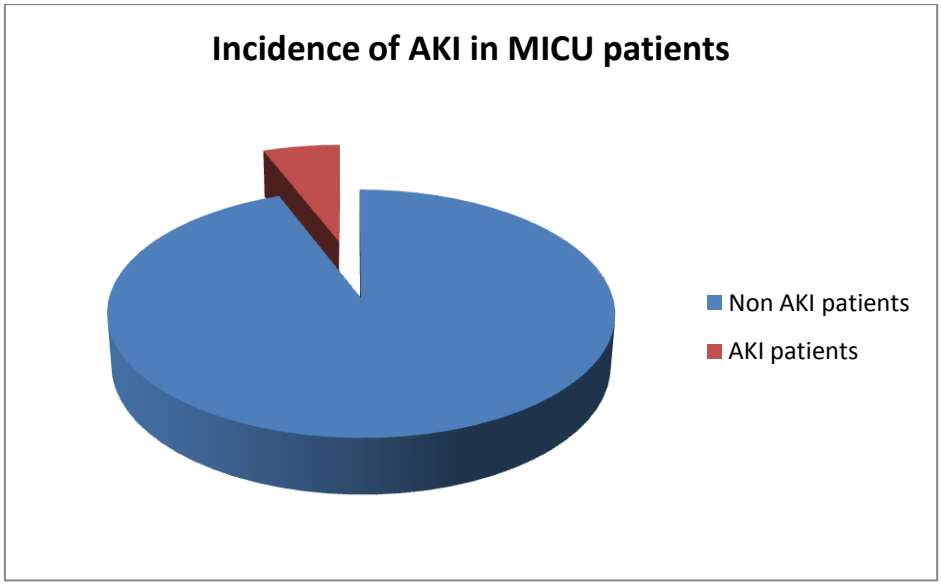


Table no. 2 showing Incidence of AKI as per sex

Sex	Total		AKI	
	No	%	No	%
Male	3302	61.02	196	62.1
female	2110	38.98	120	37.9
Total	5412		316	

Figure no. 2

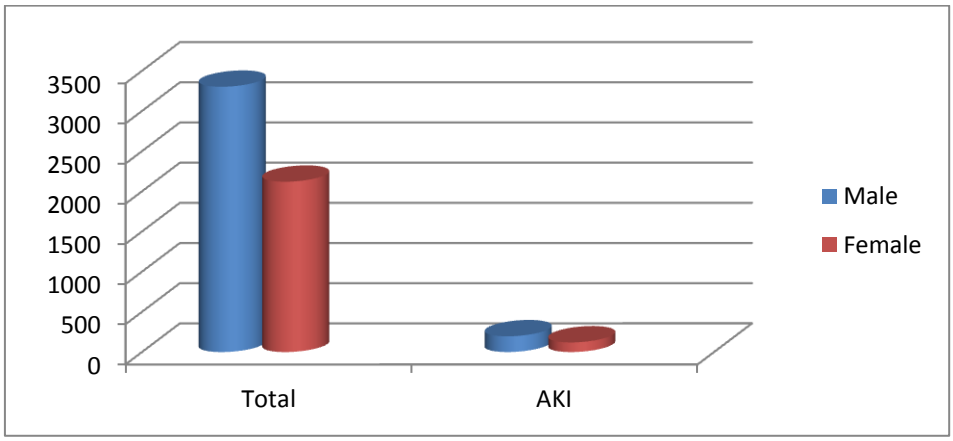


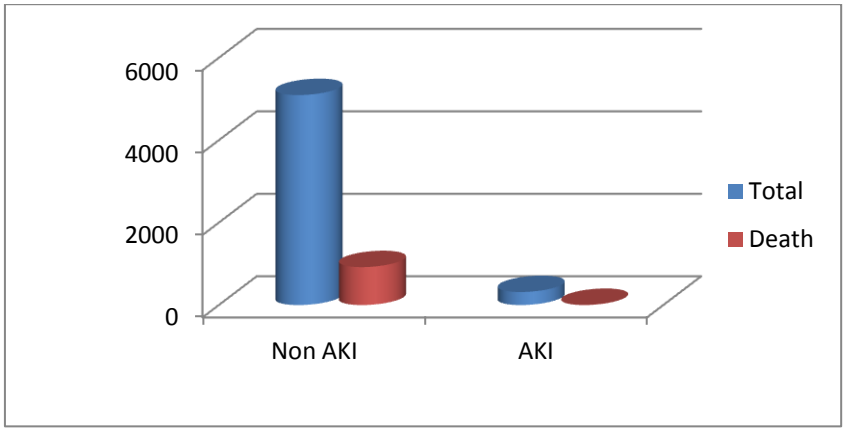
Table no. 3 Age wise distribution in AKI patients

Age (yrs)	Total		AKI	
	No	%	No	%
15-30	1362	25.17	65	20.57
30-50	1619	29.92	112	35.44
>50	2431	44.91	139	43.98
Total	5412		316	

Table no. 4 shows association of death and AKI

PATIENTS	TOTAL	DEATH	%
Non AKI	5096	921	18.1
AKI	316	145	45.88
Total	5412	1066	19.69

Figure no. 3



Discussion

A study by Rinaldo *et* al the incidence of AKI in ICU patients has widely ranging between 1 to 25%[(1)]. In our study the incidence was nearly 6%. The low incidence in our study may be due to we had only included medical intensive care unit patients not any surgical patients, and we excluded any CKD patients. A multicenter study on nearly 30000 patients by Shigehiko *et* al reported 5.7% incidence of AKI in critically ill patients[(2)].Osteomann M *et* al using the RIFLE classification has been found Risk Injury and Failure approximately 17%, and 7% respectively[(3)]. The mean age of AKI developed in intensive care unit is generally more than 40 yrs. In our study it was 48.11 yrs. J prakash *et* al reported mean age was 44.9±17 yrs[(4)]. The older age is more prone to develop AKI due to low resistance power, more systemic and infective disease prevalence. The association of death in AKI patients in intensive care unit is very high nearly 30 to 60% in different studies. The variation may be due to available facilities in ICU, differ etiology and studies definition. Levy EM *et* al reported 37% vs7% death in AKI patients than Non-AKI in ICU patients[(5)]. In our study the mortality of AKI patients was 45.88% where as it was only 18.10% in Non-AKI patients.

Conclusion

The incidence of AKI is nearly 6% in our study and associated with significant mortality than non AKI patients irrespective of age and sex distribution.

Consent

All authors declare that written informed consent was obtained from the patient for publication in consent form

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Competing Interest

All authors declared that no competing interest exist.

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