



STUDY OF ILLNESS SEVERITY (RIFLE CLASS) OF ACUTE KIDNEY INJURY IN PATIENTS PRESENTING AT A TERTIARY CARE HOSPITAL IN NORTHERN INDIA.

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ABSTRACT

Introduction: Acute kidney injury is a syndrome characterized by the rapid loss of the kidney's excretory function and is typically diagnosed by the accumulation of end products of nitrogen metabolism (urea and creatinine) or decreased urine output, or both. A total of 150 patients of acute kidney injury admitted in tertiary care hospital were studied and were graded into various categories of severity on the basis of RIFLE class.

Materials and methods: This study was conducted in the Post Graduate Department of Medicine in GMC Jammu over a period of one year (Nov. 2016 to Oct. 2017). We included adult patients admitted to the tertiary care hospital. All patients aged 18 years and above with AKI and those who will develop AKI after admission during the period of study. Patients with acute kidney injury were classified on the basis of RIFLE classification proposed by acute dialysis quality initiative in 2004 and accordingly severity of illness was graded.

Results: According to RIFLE classification of acute kidney injury, out of 150 patients, 35(23.3%) patients were in class risk (R), 50(33.4%) patients in class injury (I) and 65(43.3%) patients in class failure (F).

KEYWORDS : Acute kidney injury, etiology, tertiary care hospital, RIFLE class.

INTRODUCTION

The traditionally used term ARF often is used in reference to the subset of patients, often admitted with an acute need for dialysis support. As even modest increases in serum creatinine are associated with a dramatic impact on the risk for mortality, the clinical spectrum of acute decline in GFR is broader, and the minor deterioration in GFR and kidney injury should be captured in a working clinical definition of kidney damage and allows early detection and intervention **Chertow GM et al., 2005(1); Lasnigg A et al., 2004(2)**. For that reason, the term ARF was replaced recently by that of acute kidney injury (AKI), and the ARF preferably should be restricted to patients who have AKI and need renal replacement therapy (RRT) **Biesen WV et al., 2006(3)**.

Acute kidney injury still remains an enigmatic and debated subject, not only regarding its incidence (reportedly ranging from 1 to 31%) and mortality (ranging from 19 and 83%) but also regarding its most optimal treatment and prevention **Lamerie N et al., 2006(4)**. It is conceivable that, besides differences in severity of illness [community acquired versus hospital acquired versus intensive care unit (ICU) acquired AKI] and the type of centre reporting the data (primary versus secondary or tertiary hospitals, cardiac surgery versus no cardiac surgery patients), these remarkable difference in incidence and prognosis are to a large extent due to babylonian confusion that is created by a lack of a universal definition of AKI. The recently reported changes in epidemiology and outcomes of patients with AKI, based on analysis of large administrative outcomes of patients with AKI, based on analysis of large administrative databases **Waiker SS et al., 2006(5); Xue JL et al., 2006(6)**, probably are influenced at least partially by the changing paradigm of the definition of AKI **Lamerie N et al., 2006(7)**.

RIFLE classification is not a diagnostic one, but a staging system based, retrospectively, upon the maximum serum creatinine. According to RIFLE classification, RISK[®] is defined as an increase of baseline serum creatinine 1.5 times or decrease in GFR greater than 25% or urine output of less than 0.5 ml/kg/hr for greater than 6hrs. Injury (I) is defined by a doubling of base line serum creatinine or a reduction of urinary output below 0.5ml/kg/hr for at least 12 hours or decrease in GFR of greater than 50%. Failure (F) is defined as a threefold increase of serum creatinine or decrease in GFR of >75% or urinary output of <0.3ml/kg/hr for >24 hours or anuria for >12 hours. Loss (L) is defined by persistent acute renal failure with need for RRT >4 weeks. ESRD (E) is defined by complete loss of kidney function for more than 3 months **Biesen VM et al., 2006**.

OBJECTIVES

To Study Illness Severity (RIFLE Class) Of Acute Kidney Injury In Patients Presenting at a Tertiary Care Hospital In Northern India.

MATERIALS AND METHODS

INCLUSION CRITERIA:

All patients aged 18 years and above with AKI and those who will develop AKI after admission during the period of study. Patients with acute kidney injury were classified on the basis of RIFLE classification proposed by acute dialysis quality initiative in 2004. We studied 150 patients of acute kidney injury in tertiary care hospital during the study period.

EXCLUSION CRITERIA:

- Patient aged below 18 years.
- Patients with preexisting renal disease.
- Patients with ESRD or on chronic dialysis.
- Those who received renal transplantation.

Patients with acute kidney injury were classified on the bases of RIFLE criteria proposed by acute dialysis quality initiative in 2004. The RIFLE criteria is shown in the table below:

Stage	GFR criteria	Urine output criteria
Risk	Increase creatinine x 1.5 or GFR decrease >25%	Urine output <0.5ml/kg/hr x 6 hr.
Injury	Increase creatinine x 2 or GFR decrease >25%	Urine output <0.5ml/kg/hr x 12 hr.
Failure	Increase creatinine x 3 or GFR decrease >25%	Urine output <0.3ml/kg/hr x 24 hr. or Anuria x 12 hr.
Loss	Persistent ARF = complete loss of kidney function >4 weeks	
ESRD	End stage kidney disease (>3 months)	

RESULTS

RIFLE class of acute kidney injury.

RIFLE class	Frequency	Percent
Risk	35	23.3%
Injury	50	33.4%
Failure	65	43.3%
Total	150	100.0%

According to RIFLE classification of acute kidney injury, out of 150 patients, 35(23.3%) patients were in class risk (R), 50(33.4%) patients

in class injury (I) and 6 RIFLE class in relation with vasopressor support.

Vasopressor support	Risk	Injury	Failure	Total
None	count percent	32 35.2%	31 34.0%	28 30.8%
Dopamine	count percent	3 11.1%	10 37.0%	14 51.9%
Noradrenaline	count percent	0 0%	4 100.0%	0 0%
Both	count percent	0 0%	5 17.8%	23 82.2%
Total	count percent	35 23.3%	50 33.4%	65 43.3%
				150 100.0%

Out of 150 patients, 59 patients were on vasopressor support, out of which 27 patients were on dopamine, 4 patients on nor adrenaline and 28 patients on both dopamine and nor adrenaline. 3(11.1%) patients on dopamine were in class risk, 10(37%) patients were in class injury and 14(51.9%) patients were in class failure. All 4 patients on noradrenaline were in class injury. Out of 28 patients on dual support, 5(17.8%) patients were in class injury and 23(82.2%) were in class failure. 94 patients had no need of vasopressor support, out of which 32(35.2%) patients were in class risk, 31(34%) patients in class injury and 28(30.8%) patients in class failure. So vasopressor support had significant effect on the RIFLE class of acute kidney injury ($p = <0.001$).

DISCUSSION

We conducted a single centre study with 150 patients to characterize acute kidney injury, defined by RIFLE classification. Out of 150 patients, 62 patients were female and 88 were males. According to RIFLE classification, 23.3% patients were in class risk, 33.4% in class injury and 43.3% in class failure in our study, which is consistent with the study of **Cruz DN et al** who also reported 19%, 35%, & 46% in class risk, class injury, and class failure respectively. It is also consistent with the study of **Hoste EA et al(8)**, **Malleshappa P et al(9)**. Patients with acute kidney injury had hospital mortality rate of 30.7% in our study, which is in consistent with the study of **Eswarappa M et al (10)** who reported hospital mortality of 37.6%. In our study, patients with maximum RIFLE class risk (R), class injury (I) and class failure (F) had hospital mortality rate of 5.7%, 24% and 49.3% respectively. **Malleshappa P et al** found mortality rate of 11.1%, 14.8% and 31.7% in RIFLE class risk, class injury and class failure respectively.

CONCLUSION

The mortality rate in AKI patients remains high despite significant advances in medical care. Out of 150 patients, 23.3% were classified as risk(R), 33.4% as injury(I) and 43.3% as failure(F). The mortality of patients with acute kidney injury was 5.7%, 24%, and 49.3% in class "risk", class "injury" and class "failure" respectively.

Conflicts of interest: none

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