



UROLOGY

ASSESSMENT OF RIFLE CRITERIA IN ACUTE RENAL FAILURE IN HOSPITALISED PATIENTS

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Abstract

Acute renal failure (ARF) is a common complication of critical illness, which is associated with high mortality and has a separate independent effect on the risk of death. ARF is common in the intensive care unit (ICU). The high prevalence of ARF in the ICU setting necessitates a firm understanding by critical care providers of the salient issues related to timing of initiation of renal replacement therapy (RRT), choice of modality, and optimal dose, all of which remain subjects of substantial debate and active clinical investigation. We report our series of progression between stages of RIFLE classification and to relate the classification to need for renal replacement therapy, mortality/morbidity in critically ill patients.

Keywords: Acute renal failure, RIFLE, Outcome

Introduction

Acute renal failure is well recognized for its impact on outcome of patients admitted to ICU illness. Yet there is no consensus on amount of dysfunction that defines acute kidney injury, with more than 30 definitions in use in today literature¹⁻⁷. To establish a uniform definition for acute kidney injury, the Acute Dialysis Quality Initiative formulated the Risk, Injury and failure (RIFLE) classification. RIFLE defines three grades of increasing severity of acute kidney injury-risk (class R), injury (class I) and failure (class F) and two outcomes classes (loss and end stage kidney disease). A unique feature of RIFLE classification is that it provides three grades of severity for acute kidney injury based on changes in either serum creatinine / gfr or urine output from baseline condition⁸⁻¹¹. Risk (serum creatinine X 1.5 or urine output UO <0.5ml/kg/hrX6hrs) Injury (serum creatinine X 2 or UO <0.5ml/kg/hrX12hrs) Failure (serum creatinine X 3 or serum creatinine >4mg/dl or UO <0.3ml/kg/hr X 24hrs or anuria X 12 hrs) Loss (persistent acute renal failure > 4 wks) End stage renal disease (>3mnths of End stage renal disease). The aim of the study is to validate the RIFLE criteria in defining acute renal failure. To examine progression between stages of RIFLE classification and to relate the classification to mortality and need of renal replacement in critically ill patients We classified patients according to maximum RIFLE class, the RIFLE class was based on worst of either glomerular filtration rate (GFR) or urine output .Progression of acute kidney injury to maximum RIFLE class was studied. Mortality and need of renal replacement therapy is to be studied.

Materials and Methods

All patients will be interviewed with regards to symptoms, duration, medications, alcohol, smoking, and diet etc; the data included demographic, physiologic, laboratory parameters followed by examination for weight and general systemic examination. Baseline renal function was assessed by the least serum creatinine admission gfr by modification of diet in renal disease (MDRD) equation, in patients with history of renal insufficiency creatinine at admission. Severity of illness assessed by Acute Physiology and Chronic Health Evaluation (APACHE) II score. Urine output at least every 2hrs, at least once daily serum creatinine. We classified patients according to maximum RIFLE class, the RIFLE class was based on worst of either GFR or urine output .Progression of acute kidney injury to maximum RIFLE class was studied. Mortality, length of stay and need of renal replacement therapy is to be studied

Patients

Prospective cohort study of all adult hospitalized during 12 months excluding patient: on chronic hemodialysis, readmissions age less than 18 years, renal transplant patients, hospital stay less than 24hrs

Exclusion Criteria

Patients on chronic dialysis; Readmissions; Age less than 18 years; Renal transplant patients; Hospital stay less than 24hrs

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Study Design

All renal failure patients will be interviewed with regards to symptoms, duration, medications, alcohol, smoking, and diet etc; followed by examination for weight and general systemic examination. Baseline renal function was assessed by the least serum creatinine admission gfr by MDRD equation, in patients with history of renal insufficiency creatinine at admission. Severity of illness was assessed by APACHE II score.

Urine output atleast every 2hrs, at least once daily serum creatinine. Baseline characteristic on the occurrence of acute kidney injury is to be studied; Progression of acute kidney injury to maximum RIFLE class was studied. Mortality and need of renal replacement therapy is to be studied.

Risk, injury, failure, loss, and end-stage (RIFLE) classification

Class	Gfr critria	Urine output criteria
Risk	Cr x 1.5	<0.5ml/kg/hr x 6hrs
Injury	Cr x 2.0	<0.5ml/kg/hr x 12hrs
Failure	Cr x3.0, or Cr>4mg/dl Acute rise >0.5mg/dl	<0.3ml/kg/hr x 24hrs, or anuria x 12
Loss	persistent acute renal failure =complete loss of kidney function >4wks	
End-stage kidney disease	End stage kidney disease >3 months	

Results

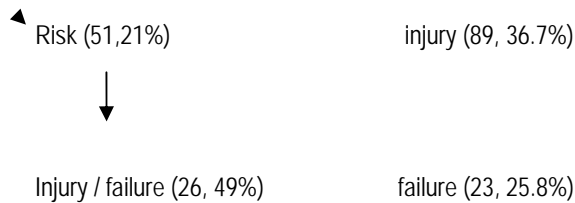
A total of 242 patients of acute renal failure, 88 from ICU/154 from non ICU were evaluated.

The baseline characteristics of patients are represented.

	RISK	INJURY	FAILURE
NO OF SUBJECTS (242)	51(21%)	89(36.7%)	102(42%)
SEX			
Male	31	60	70
Female	20	29	31
AGE (mean)years			
Male	36.5	48.8	49.7
female	46.3	47.6	47.2
TYPE OF ADMISSION			
Infections	14	25	41
Cardiovascular	10	12	14
Respiratory system	4	11	9
Neurological	1	2	1
Gastroenterological	3	6	6
Malignancy	2	3	2
Trauma	6	13	8
Others	11	17	21
APACHE II (mean)*	14	17	23

APACHE II score-in baseline character of subjects was higher in ICU patients than non ICU which was statistically significant p <0.02, also FAILURE group had higher score than in RISK/INJURY group which was statically significant p <0.001

Progression of subjects



Outcome

242 patients of acute renal failure were enrolled in this study. At admission 51 patients (21%) had risk, 89 patients (36.7%) had injury, 102 patients (42%) had

failure. Progression was followed -Maximum risk were 26 patients (10.7%), maximum injury were 66 patients (27%), maximum failure were 150 patients (61.9%).

	RISK	INJURY	FAILURE
RRT	0(0%)	1(0.15%)	56(37%)*
MORTALITY	1(0.38%)	7(11%)	32(21%)*

*Mortality was higher in failure group than in risk/injury group which was statistically significant p <0.001

Of ICU patients no patient of risk group required RRT, 1 patient of injury group CRRT, 36patients (40.9%) of failure group required RRT(3 CRRT,33HD). Of non ICU patients no patients of risk and injury required RRT, 20 patients(12.9%) of failure group required HD. One patient of risk group (ICU) expired,7 patients of injury group(10.6%) expired(4 in ICU/3 in non ICU),32 patients of failure group(21.3%) expired(20 ICU 35.7%/12 non ICU 12.7%) .

Discussion

In baseline characteristic of subjects APACHE II score was higher in failure group than in risk/injury group which was statistically significant. About 50% of patients progressed in risk group at baseline progressed, about 25% of injury group progressed to failure.ICU patients had higher APACHE II score, 40.9% of failure group in ICU patients required RRT compared to 12.9% from non ICU patients. Mortality was higher in failure group, 35.7% ICU patients of failure group expired compared to 12.7% among non ICU.

Conclusion

At admission patients of failure group had a higher APACHE II score. Almost none of risk/injury group required RRT. Almost 50% of risk group and 25%of injury group progressed. In ICU group 41%patients of failure required RRT compared to 21%in non ICU group. Mortality was significantly higher in failure group i.e 35.7 % (ICU group), 12.7%(non ICU group).

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