



RIFLE Classification as a Predictor of Short Term Prognosis in Critically-ill Cirrhotic Patient

An Essay

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List of Abbreviations

<i>Abbr.</i>	<i>Full term</i>
AFP	: Alpha Feto-Protein
AKI	: Acute Kidney Injury
AKIN	: Acute Kidney Injury Network
AIDS	: Acquired Immunodeficiency Syndrome
Alb	: Albumin
ALF	: Acute Liver Failure
ALKM	: Anti-Liver Kidney and Microsomes
ALP	: Alkaline Phosphatase
ALT	: Alanine Transaminase
ANA	: Antinuclear Antibody,
ANCA	: Antineutrophil Cytoplasmic Antibody
APACHE	: Acute Physiology And Chronic Health Evaluation
APD	: Adult Patient Database
APS	: Acute Physiology Score
ARF	: Acute Renal Failure
ASMA	: Antismooth Muscle Antibody
AST	: Aspartate Transaminase
BIL	: Bilirubin
CBC	: Complete Blood Count

List of Abbreviations

COPD	: Chronic Obstructive Pulmonary Disease
CRF	: Chronic Renal Failure
CT	: Computed Tomography
CTP	: Child-Turcotte-Pugh Classification
DIC	: Disseminated Intravascular Coagulopathy
DM	: Diabetes Mellitus
ECMO	: Extra-Corporeal Membrane Oxygenation
ESR	: Erythrocyte Sedimentation Rate
ESRD	: End Stage Renal Disease
F_iO₂	: Fraction of Inspired Oxygen
FSH	: Follicle Stimulating Hormone
GABA	: Gamma-Amino-Butyric Acid
GCS	: Glasgow Coma Scale
GFR	: Glomerular Filtration Rate
GGT	: Gamma Glutamyl Transpeptidase
Hb	: Hemoglobin
HBV	: Hepatitis B Virus
HCC	: Hepatocellular Carcinoma
HCO₃	: Bicarbonate
Hct	: Hematocrite
HCV	: Hepatitis C Virus
HDU	: High Dependency Unit

List of Abbreviations

HH	: Hereditary Hemochromatosis.
HIV	: Human Immune Deficiency Virus
HLA	: Human Leukocyte Antigen
HOA	: Hypertrophic Osteo-Arthropathy
HRS	: Hepatorenal Syndrome
HTN	: Hypertension
ICU	: Intensive Care Unit
INR	: International Normalized Ratio
LDLT	: Living Donor Liver Transplantation
LFTs	: Liver Function Tests
LH	: Luteinizing Hormone
LVP	: Large Volume Paracentesis
MAP	: Mean Arterial Pressure
MDRD	: Modification of Diet in Renal Disease
MELD	: Model for End -Stage Liver Disease
MPM	: Mortality Probability Models
NASH	: Non Alcoholic Steato-Hepatitis
NO	: Nitric Oxide
NSAIDs	: Non Steroidal Anti-Inflammatory Drugs
NYHA	: New York Heart Association
OR	: Odds Ratio
P-ANCA	: Perinuclear Anti-Neutrophil Cytoplasmic Antibody

List of Abbreviations

PaO₂	: Arterial Oxygen Tension
PAO₂	: Alveolar Oxygen Tension
PBC	: Primary Biliary Cirrhosis
PC	: Prothrombin Concentration
PCO₂	: Carbon Dioxide Tension
PCR	: Polymerase Chain Reaction
PGE₂	: Prostaglandin E ₂
PLT	: Platelets
PSC	: Primary Sclerosing Cholangitis
PT	: Prothrombin Time
P value	: Significance Level
PVD	: Portal Vein Diameter
RCTs	: Randomized Controlled Trials
RIFLE	: Risk-Injury-Failure-Loss of kidney function- End stage renal disease
ROC	: Receiver Operation Curve
RR	: Relative Risk
RRT	: Renal Replacement Therapy
SAAG	: Serum-Ascites Albumin Gradient
SAPS	: Simplified Acute Physiology Score
SBP	: Spontaneous Bacterial Peritonitis
SCr	: Serum Creatinine

List of Abbreviations

SO₂	: Oxygen Saturation
SOFA	: Sequential Organ Failure Assessment
S.D.	: Standard Deviation
SGOT	: Serum Glutamic Oxaloacetic Transaminase
SGPT	: Serum Glutamic Pyruvic Transaminase
TIPS	: Transjugular Intrahepatic Portosystemic Shunt
TPO	: Thrombopoietin
UK	: United Kingdom
UNOS	: United Network for Organ Sharing
UO	: Urine Output
WBC's	: White Blood Cells

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INTRODUCTION

Liver cirrhosis represents the final common pathway of virtually all chronic liver disease and is characterized by an accumulation of extracellular matrix rich in fibrillar collagen (*Jang ., 2009*).

A feature of liver cirrhosis is the existence of disturbances in systemic circulation characterized by marked arterial vasodilation that occurs principally in the splanchnic circulation and generates a reduction in total peripheral vascular resistance and arterial pressure and a secondary increase in cardiac output. These abnormalities are central to the development of several major complications of cirrhosis, such as hepatorenal syndrome, ascites, spontaneous bacterial peritonitis, dilutional hyponatremia, and hepatopulmonary syndrome. Renal failure is the most clinical relevant of these conditions as its appearance generally indicates very poor prognosis (*Iwakiri and Groszmann ., 2006*).

Elevated serum creatinine (SCr) levels of > 1.3 or 1.5mg/dl have been identified as a predictor of poor prognosis in patients with advanced liver cirrhosis (*Chen et al., 2003*).

The common used scoring systems for predicting the outcome in critically ill cirrhotic patients, such as Child–Pugh score , Sequential Organ Failure Assessment (SOFA) , Model for End-stage Liver Disease (MELD) , and Acute Physiology, Age, Chronic Health Evaluation II (APACHE II) evaluate renal function according to the serum creatinine (*Kamath et al., 2001*) .

The RIFLE (risk of renal failure, injury to the kidney, failure of kidney function, loss of kidney function, and end-stage renal failure) classification was first proposed by the Acute Dialysis Quality Initiative (ADQI) group at the second ADQI conference in Vicenza, Italy, in May 2002, in an attempt to standardize the study of ARF. The RIFLE criteria classify ARF into three groups (risk, injury, and failure) according to changes in SCr and urine output (UO) (*Bellomo and Ronco 2007*).

To date, the RIFLE classification has been applied in critical ill patients receiving renal replacement therapy, cardiac surgery patients, heterogeneous patients from intensive care units (ICUs), heterogeneous population of hospitalized patients, and unique populations such as patients

requiring extracorporeal membrane oxygenation for post-cardiotomy cardiogenic shock (*Bellomo and Ronco 2007*).

RIFLE classification is a very important tool that can be used simply to stratify mortality in critically ill cirrhotic patients and thus it is recommended to use it with other scoring system to predict mortality in these patients (*colongitas et al.,2006*).

AIM OF THE WORK

The objective of this study is to identify the association between hospital mortality and RIFLE criteria in critically ill cirrhotic patient. Other scoring systems, including Child score, SOFA score, MELD score and APACHE II score are also used for comparison with the RIFLE classification.

Chapter (1)

Liver Cirrhosis

Cirrhosis is the end result of chronic liver injury from a variety of causes. It is defined by marked disruption of hepatic architecture with extensive fibrosis and fibrotic encirclement of regenerative nodules. There are a large number of conditions that can lead to cirrhosis. The development of portal hypertension and its complications contribute substantially to the morbidity and mortality associated with cirrhosis. Consequently, the prevention and treatment of these complications is one of the cornerstones of the management of the cirrhotic patient (**Mathews *et al.*, 2006**).

Etiologies of cirrhosis:

Most common causes of cirrhosis

Chronic hepatitis C:

The hepatitis C virus spreads through contact with infected blood, such as from a needle stick accident, injection drug use, or receiving a blood transfusion before 1992. Less commonly, hepatitis C can be spread by sexual contact with