RIFLE classification as a predictor of short term prognosis in critically ill cirrhotic patient

Thesis
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Internal Medicine

By

Ahmed Abdul Fattah Abdul Maguid Alsherif
M.B., B.CH.
Faculty of Medicine, Cairo University

Under supervision of

Prof. Dr. Ahmed Shawky Alsawaby
Professor of Internal Medicine
Faculty of Medicine, Ain Shams University

Prof. Dr. Azza Emam Mohamed
Assistant professor of Internal Medicine
Faculty of Medicine, Ain Shams University

Dr. Hesham Mahmoud Hassan Darwish
Lecturer of Internal Medicine
Theodor Bilharz Research Institute

Faculty of Medicine
Ain Shams University
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الطبيب / أحمد عبدالفتاح عبدالمجيد الشريف

بكالوريوس الطب والجراحة . كلية الطب . جامعة القاهرة

تحت إشراف

أ.د/ أحمد شوقي الصوابي

أستاذ الباطنة العامة

كلية الطب . جامعة عين شمس

أ.م.د/ عزة إمام محمد

أستاذ مساعد الباطنة العامة

كلية الطب . جامعة عين شمس

د/ هشام محمود حسن درويش

مدرس الباطنة العامة

معهد تيودور بلهارس للأبحاث

كلية الطب

جامعة عين شمس

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Summary

End-stage liver disease is frequently complicated by renal function disturbances. Cirrhotic patients with renal failure admitted to intensive care units (ICUs) have high mortality rates. So, early detection of Acute Kidney Injury (AKI) in these patients is very important to prevent complication and eventually decreases mortality rate.

Most of the commonly used clinical scoring systems evaluate renal function according to the serum creatinine level which is unable to detect AKI in the early stages where the serum creatinine may be low while GFR is markedly reduced since there may not have been sufficient time for the creatinine to accumulate.

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/or urine output and thus can detect small and early injury that might occur to the kidney.

This study was performed on 100 cirrhotic patients admitted to Intensive Care Unit in the hospital of Theodore Bilharz Research Institute. 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. The studied population was classified according to the primary outcome of this study (Hospital

It is a great thing to feel success and have the pride of achieving all what is always aspired. First and foremost, thanks to ***Allah****, the merciful and most graceful, to whom I relate any success in my life.*

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Ahmed Alsherif

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List of Abbreviations

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 : Antineutophil Cytoplasmic Antibody
ANOVA : Analysis of Variance
ANZICS : Australia New Zealand Intensive Care Society
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
AUROC : Area Under Receiver Operation Curve
BIL : Bilirubin
CBC : Complete Blood Count
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_iO_2 : Fraction of Inspired Oxygen
FSH : Follicle Stimulating Hormone
GABA : Gamma-Amino-Butyric Acid

List of Abbreviations (Cont.)

GCS : Glasgow Coma Scale
GFR : Glomerular Filtration Rate
GGT : Gamma Glutamyle Transpeptidase
Hb : Hemoglobin
HBV : Hepatitis B Virus
HCC : Hepatocellular Carcinoma
HCO3 : Bicarbonate
Hct : Hematocrite
HCV : Hepatitis C Virus
HDU : High Dependency Unit
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
PaO_2 : Arterial Oxygen Tension
PAO2 : Alveolar Oxygen Tension

List of Abbreviations (Cont.)

PBC : Primary Biliary Cirrhosis
PC : Prothrombin Concentration
PCO_2 : Carbon Dioxide Tension
PCR : Polymerase Chain Reaction
PGE2 : Prostaglandin E2
PLT : Platlets
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
SO2 : Oxygen Saturation
SOFA : Sequential Organ Failure Assesment
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
USA : United States of America
WBC's : White Blood Cells

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RIFLE Classification as a predictor of short term prognosis in critically ill cirrhotic patient

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(1).

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 (2, 3, 4, 5).

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 (6).

The common used scoring systems for predicting the outcome in critically ill cirrhotic patients, such as Child–Pugh score (7), Sequential Organ Failure Assessment (SOFA) (8), Model for End-stage Liver Disease (MELD) (9), and Acute Physiology, Age, Chronic Health Evaluation II (APACHE II)(10) evaluate renal function according to the serum creatinine.

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) (11).
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(11).

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.

Patients and Methods:

This study will be performed on 100 cirrhotic patients admitted to Intensive Care Unit in the hospital of Theodore Bilharz Research Institute.

Exclusion criteria are:

* Pediatric patients ≤ 18 years of age.
* Uremic patients undergoing renal replacement therapy.
* Patients who had undergone liver transplantation.

The following data will be collected for each patient on the 1st day of admission:

→ Demographics.
→ Reason for ICU admission.
→ Acute diagnosis.
→ RIFLE classification.
→ Child score.
→ SOFA score.
→ MELD score.
→ APACHE II score.

And finally, the duration of hospitalization and the outcome of each patient will be recorded.