ARTERIAL KETONE BODY RATIO IN VARIOUS HEPATIC PATHOLOGIC CONDITIONS AND MULTIPLE ORGAN FAILURE

Essay

Submitted in Partial fulfillment of the requirement for master degree in clinical pathology

Presented by

Magdy Adly Metyas
(M.B.B.Ch.)

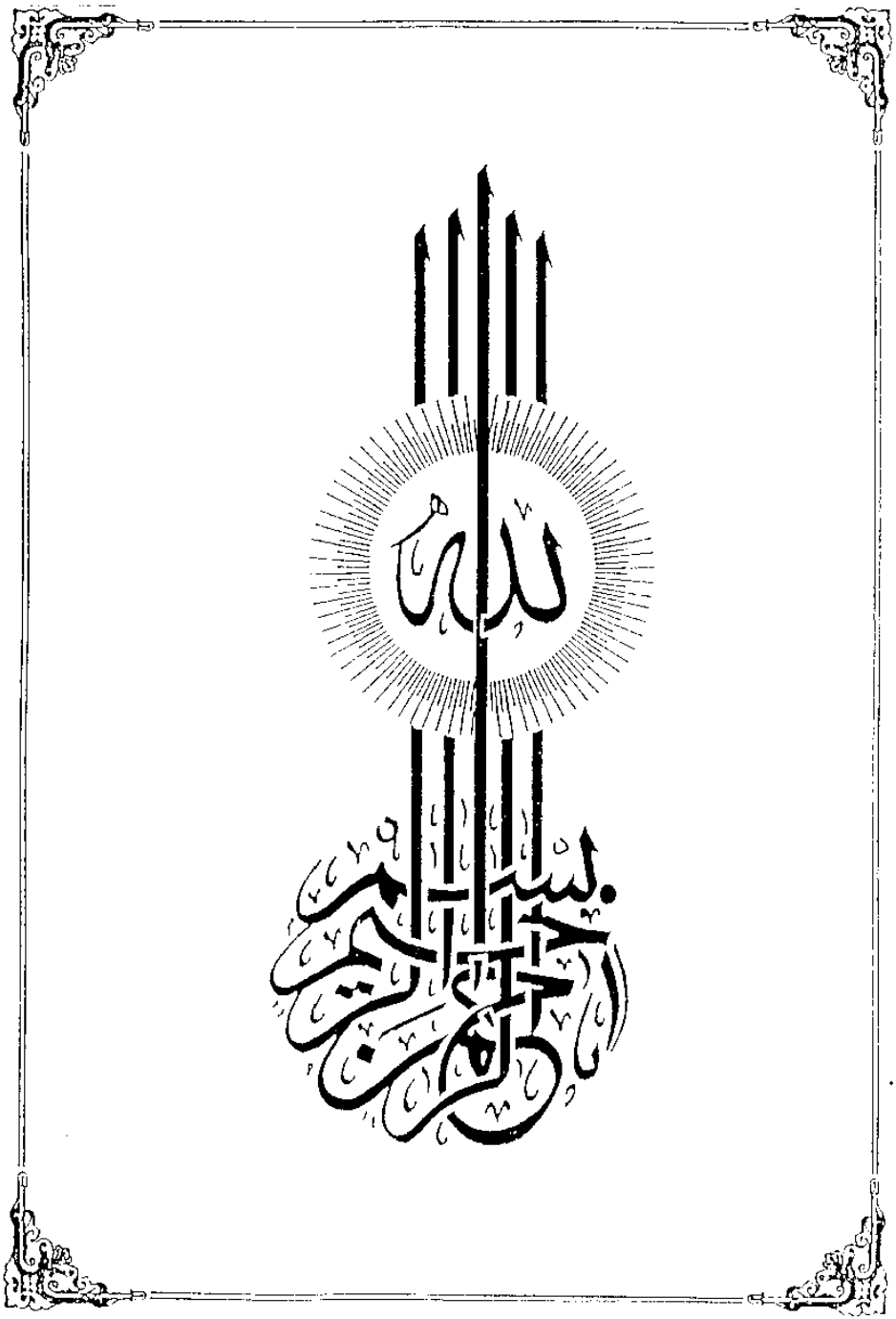
Supervisor

Dr. Hany Sobhy Rufail
Prof. of Cl. Pathology
Faculty of Medicine
Ain Shams University

Dr. Nashwa Ahmed Adel El-Badawy
Assistant Prof. of Cl. Pathology
Faculty of Medicine
Ain Shams University

Dr. Mona Mohamed Zaki
Lecturer of Cl. Pathology
Faculty of Medicine
Ain Shams University

1996



Acknowledgement

First of all, I would like to thank GOD.

I wish to express my most heartful gratitude to Dr. Hany Sobhy Rufail, Prof. of Cl. Pathology, Faculty of Medicine, Ain Shams University for his generous support and guidance.

I owe my great thanks and appreciation to Dr. Nashwa Ahmed Adel El-Badawy, Assist. Prof. of Cl. Pathology, Faculty of Medicine, Ain Shams University for her support and continuous encourgement throughout this study.

I would like to express my sincere thanks and gratitude to Dr. Mona Mohamed Zaki, Lecturer of Cl. Pathology, Faculty of Medicine, Ain Shams University for her continuous supervision and help to perform this essay.

Special thanks to my father, mother and all members of my family.

LIST OF ABBREVIATIONS

AKBR	Arterial ketone body ratio
ALT	Alanine transaminase
AST	Aspartate transaminase
ATP	Adenosine triphosphate
CSF	Cerebrospinal fluid
EGP	Endogenous glucose production
F.H.F.	Fulminant hepatic failure
FDP	Fibrinogen degradation products
FFA	Free fatty acid
G3P	Glycerol 3-phosphate
GABA	Gamma amino butyric acid
HBV	Hepatitis B- virus
HMG-COA	B-hydroxy B-methyl glutaryl COA
HSS	Hepatic stress score.
NAD+	Oxidized nicotinamide adenine dinucleotide
NADH	Reduced nicotinamide adenine dinucleotide
OLTX	Orthotopic liver transplantation.
PSE	Portal systemic encephalopathy
RTI	Redox tolerance index
TCA	Tricarboxylic acid cycle
TKB	Total ketone body
VLDL	Very low density lipoprotien

LIST OF TABLES

LIST OF FIGURES

CONTENTS

INTRODUCTION AND AIM OF ESSAY

INTRODUCTION

The liver plays a central role in different biological functions and is being increasingly recognised as a critical organ in the pathogenesis of multiple organ failure (**Ozawa et al., 1983**).

Previous studies have suggested that the most basic metabolic feature leading to hepatic failure is the failure of the mitochondrial energy production to a point where hepatic energy needs are not satisfactory (**Tanaka et al., 1987**).

Thus, the assessement of hepatic functional reserve could be based on the simple assumption that normal hepatic mitochondrial metabolism is necessary to preserve normal function and prevent cellular damage. Measurement of Arterial ketone body ratio (AKBR) [Acetoacetate / B-hydroxybutyrate] , appears to offer this potential by reflecting the liver metabolic status. Moreover, AKBR is closely correlated with the energy charge level of the liver in Jaundice, massive heamorrhage, liver transplantation and after hepatic resection as a predictor of the prognosis (**Asonuma et al., 1991; and Dalton, 1994**).

The most applied laboratory method for measurement of AKBR (Concentration of acetoacetate and B-hydroxybutyrate) is an enzymatic method depending on spectrophotometric measurement of the reduction of diphosphopyridine nucleotide by B-hydoxybutyrate in the presence of B-hydroxybutyrate dehydrogenase (**Williamson and Mellanby , 1974**).

AIM OF ESSAY

The aim of this essay is to review the role of Arterial ketone Body ratio and its clinical significance in various pathologic conditions leading to multiple organ failure and the laboratory methods used for its measurment.