RHABDOMYOLYSIS IN CHILDREN WITH CHRONIC RENAL FAILURE

THESIS

Submitted in the partial fulfillment of the
Master Degree in Pediatrics

By
MANAL HELMY SAFAAN
M.B., B.Ch.

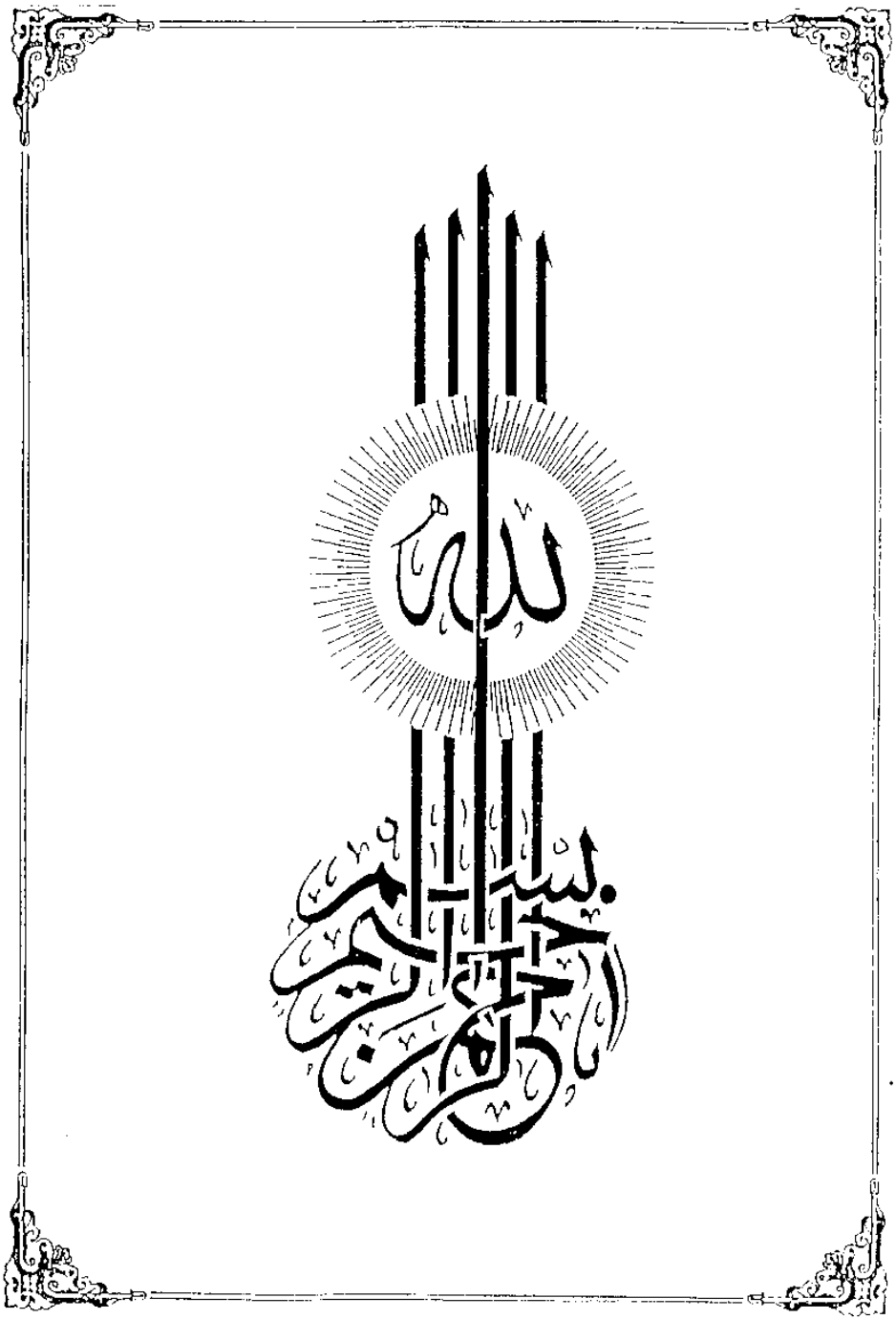
Under the Supervision of

ASSISTANT PROF. DR. KHALED SALAH AWWAAD
Assistant Professor of Pediatrics
Faculty of Medicine – Ain Shams University

DR. ELHAM MOHAMED HOSSNY
Lecturer of Pediatrics
Faculty of Medicine – Ain Shams University

DR. MANAL ZAGHLOUL MAHRAN
Lecturer of Clinical Pathology
Faculty of Medicine – Ain Shams University

Faculty of Medicine
Ain Shams University
1995



بسم الله الرحمن الرحيم

« قالوا سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم .»

صدق الله العظيم

(سورة البقرة ، الآية ٣٢)

TO ...

MY PARENTS

ACKNOWLEDGEMENT

I wish to express my deepest gratitude and appreciation to ***ASSISTANT PROF. DR. KHALED SALAH AWWAAD****, Assistant Professor of Pediatrics, Ain Shams University, who gave me the honour of working under his meticulous supervision. I do appreciate the sincere advice he offered me in every step of the work.*

No words can describe the efforts and help of ***DR. ELHAM MOHAMED HOSSNY****, Lecturer of Pediatrics, Ain Shams University, to whom I am truly indebted. Her enthusiasm and assistance made the achievement of this work possible.*

I do appreciate the kind and active participation of ***DR. MANAL ZAGHLOUL MAHRAN****, Lecturer of Clinical Pathology, Ain Shams University, in the laboratory part of the work.*

The help and encouragement from every member of the Pediatric Nephrology Unit and the Pediatric Allergy and Immunology Laboratory are sincerely acknowledged.

Finally, I am truly grateful to the children and their parents for their kind cooperation in accomplishing my thesis.

Manal Helmy

CONTENTS

ABBREVIATIONS

ADH	Antidiuretic hormone
AIDS	Acquired immune deficiency syndrome
ATP	Adenosine triphosphate
BUN	Blood urea nitrogen
Ca	Calcium
CAPD	Continuous ambulatory peritoneal dialysis
CPK	Creatine phosphokinase
CRF	Chronic renal failure
ECF	Extracellular fluid
ECG	Electrocardiogram
ESRD	End-stage renal disease
GFR	Glomerular filtration rate
Hb	Hemoglobin
Hct	Hematocrit
IGF_1	Insulin like growth factor 1
IGF_2	Insulin like growth factor 2
K	Potassium
MCV	Mean corpuscular volume
Na	Sodium
P	Phosphorus
Plt	Platelet
PTH	Parathyroid hormone
RBCs	Red blood cells
SD	Standard deviation
SLE	Systemic lupus erythematosus
UTI	Urinary tract infection
WBCs	White blood cells

LIST OF TABLES

1. Tables of Review of Literature

2. Tables of Results

LIST OF FIGURES

1. Figures of Review of Literature

2. Figures of Results

Introduction and Aim of the Work

INTRODUCTION AND AIM OF THE WORK

Rhabdomyolysis is the breakdown of skeletal muscle cells with liberation of their contents into the circulation. Therefore, it is characterized by marked elevation of serum creatine phosphokinase level and serum and urine myoglobin, potassium and phosphate (*Brumback et al.,* 1992). As rhabdomyolysis is usually associated with clearance of serum myoglobin into the urine, serum myoglobin should be rapidly estimated during rhabdomyolysis for the evaluation of acute muscle damage (*Holmgren and Valberg,* 1992).

Rhabdomyolysis can induce acute myoglobinuric renal failure, and renal biopsy in this condition can confirm the presence of tubular myoglobin casts and acute tubular necrosis (*Murugasu et al.,* 1992). However, its relation to chronic renal failure is less clear. *Muto et al.* (1987) reported a case of progressive and fatal rhabdomyolysis in a man who was under hemodialysis for 8 years. He developed severe lactic acidosis and hyperkalemia. The rhabdomyolysis was thought to be virus-induced in that case. Myoglobin levels are also known to be raised in cases of decreased renal elimination and in dialysis disequilibrium (*Chamberlain,* 1991).

With this as a background, this study is aimed to outline the magnitude of rhabdomyolysis in children with chronic renal failure in relation to other forms of metabolic derangement. The effect of hemodialysis on serum myoglobin levels and the repercussions of this problem on the management strategies are meant to be evaluated.