A STUDY OF SOME STRUCTURAL & FUNCTIONAL CHANGES OF THE KIDNEY IN PATIENTS WITH LIVER CIRRHOSIS

THESIS
Submitted for the partial fulfilment
of the M.D. Degree in
(INTERNAL MEDICINE)

BY
FAYEZ ABDULSALAM ABU-BAKR
(M.B;B.ch., M.Sc.;Internal Medicine)

SUPERVISED BY

Prof. Dr. SOHER SHEIR
Prof. of Internal Medicine
Faculty of Medicine
Ain Shams University

Prof. Dr. SAMI A.ABDEL_FATTAH
Prof. of Internal Medicine
Faculty of Medicine
Ain Shams University

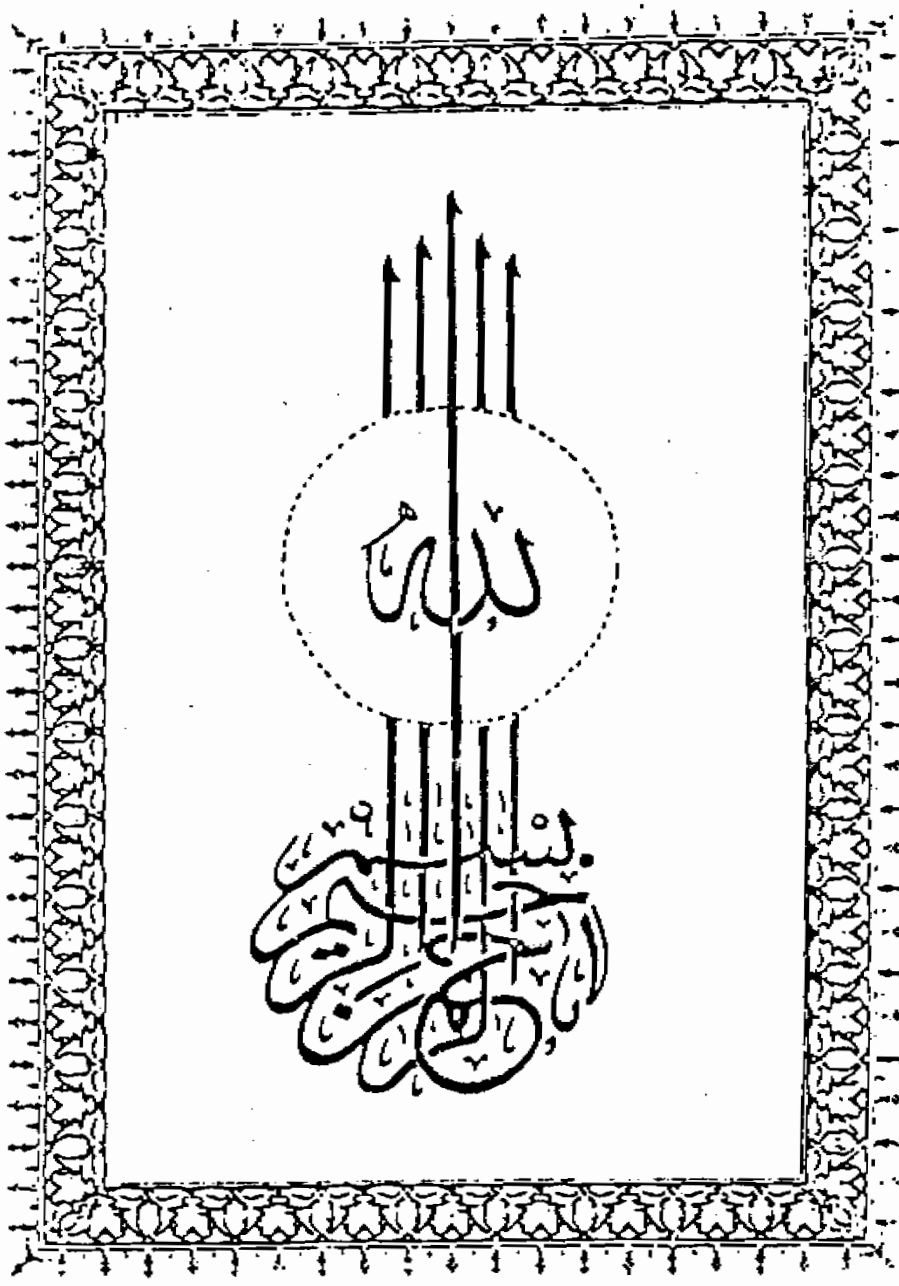
Prof.Dr. IBRAHIM A.ABDEALLAH
Prof. of Internal Medicine
Faculty of Medicine
Ain Shams University

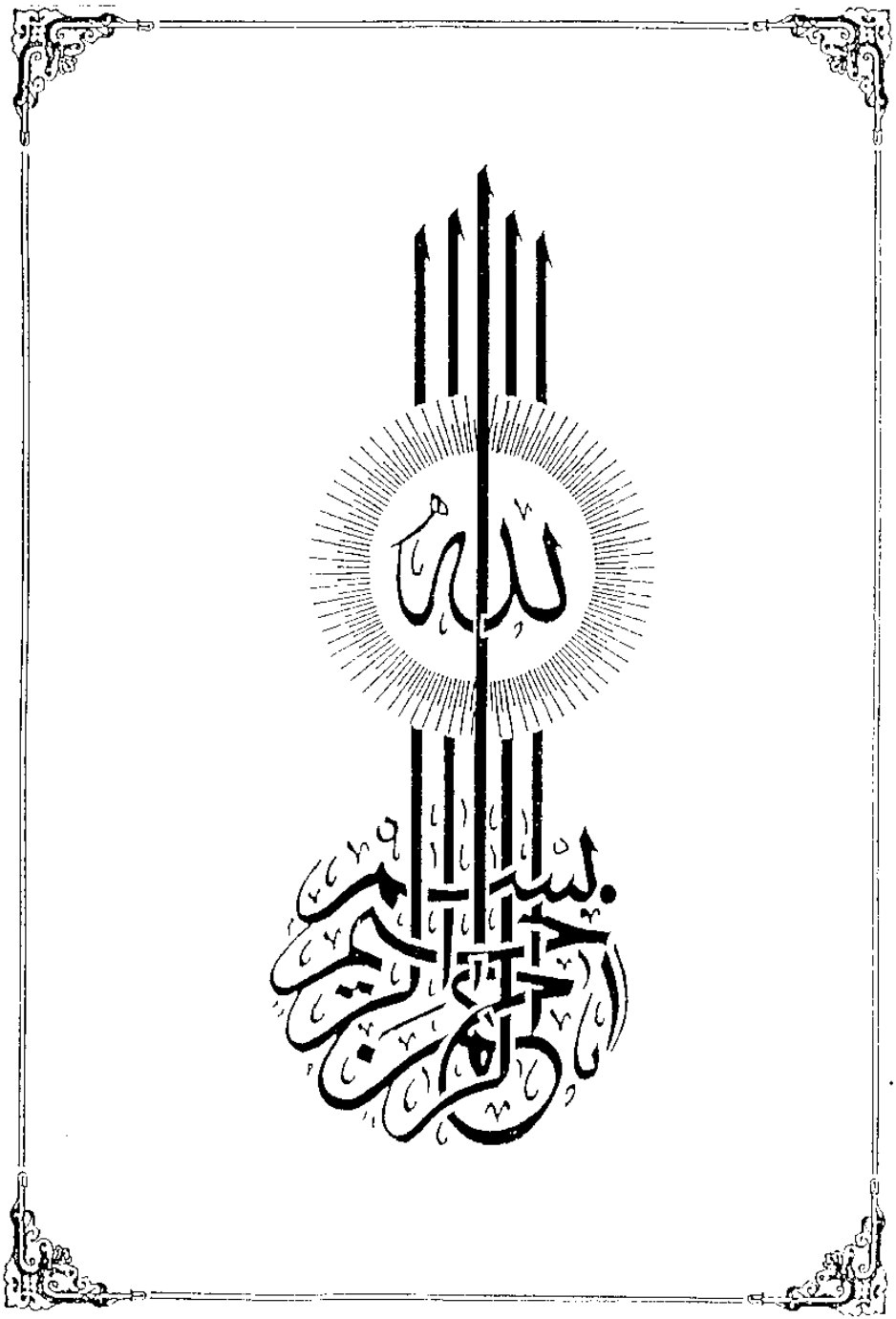
Prof. Dr. RAGGA AHMED SALEM
Prof. of Pathology
Faculty of Medicine
Ain Shams University

Co. Supervisor
Dr. MAGDY A. El-GUINAIDY
Lecturer of Internal Medicine

FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY

1993


بسم الله الرحمن الرحيم



A STUDY OF SOME STRUCTURAL & FUNCTIONAL CHANGES OF THE KIDNEY IN PATIENTS WITH LIVER CIRRHOSIS

THESIS
Submitted for the partial fulfilment
of the M.D. Degree in
(INTERNAL MEDICINE)

BY
FAYEZ ABDULSALAM ABU-BAKR
(M.B;B.ch., M.Sc.;Internal Medicine)

SUPERVISED BY

Prof. Dr. SOHER SHEIR
Prof. of Internal Medicine
Faculty of Medicine
Ain Shams University

Prof. Dr. SAMI A.ABDEL_FATTAH
Prof. of Internal Medicine
Faculty of Medicine
Ain Shams University

Prof.Dr. IBRAHIM A.ABDEALLAH
Prof. of Internal Medicine
Faculty of Medicine
Ain Shams University

Prof. Dr. RAGAA AHMED SALEM
Prof. of Pathology
Faculty of Medicine
Ain Shams University

Co. Supervisor
Dr. MAGDY A. El-GUINAIDY
Lecturer of Internal Medicine

FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY
1993

ACKNOWLEDGEMENT

Iwould like to express my deepest appreciation to prof. Dr. SOHEIR SHEIR professor and head of internal medicine departement, Ain Shams University for her valuable supervision, continuous guidance, precious advices. I am greatly honoured by her supervision.

I have no suitable words to express my internal feeling and respect to prof. Dr. SAMI ABD El-FATAH professor of internal medicine, Ain Shams University for his generous help, valuable remarks, constant supervision, encouragement and unlimited efforts through out every step of this work,.

I wish also to acknowledge prof. Dr. IBRAHIM ABD ALLAH professor of internal medicine, Ain Shams University, for his valuable directions, guidance rendered to me in this research.

Sincere thanks and gratitude should also be expressed to prof. Dr. RAGAA SALEM professor of pathology, Ain Shams University for her valuable comments and precious advices.

I would like also to express my gratitude to all my senior staff and colleagues in internal medicine departement, Dr. Mohamed El-Bokl assistant professor of internal medicine for his generous help and support for completion of this work. Also Dr. Magdy Elguiniudy lecturer of internal medicine for his efforts in the initial steps of this research.

I would like to express my sincere thanks to Dr. Abdel Fatah Abdel Salam assistant prof. of internal medicine and Dr. Reda Elwakeel assistant prof. of tropical medicine for their help and cooperation.

Special thanks to Dr. Sahar Saad El-Din lecturer of pathology for her kind cooperation in this work.

for every one who had helped in the accomplishment of this work, my deepest thanks.

Lastly best wishes for all the patients

CONTENTS

INTRODUCTION AND AIM OF WORK

INTRODUCTION

&

AIM OF THE WORK

The occurrence of liver disease and simultaneosly kidney changes has been recognized for hundred of years. Unfortunately, liver-kidney inter-relationships are exceedingly complex and at time not fully appreciated **(Brunkhorst et al, 1991).**

Studies of renal perfusion, when kidney function tests are still normal could be useful to understand the pathophysiology of functional kidney impairment in patients with liver cirrhosis **(Sacerdoti et al, 1993)**

Renal function varies enormously in patients with decompensated cirrhosis, Values for glomerular filtration rate and renal plasma flow showing a complete spectrum from twice normal down to those found with significant renal impairment **(Wilkinson et al, 1991).** Glomerular morphologic abnormalities were reported in more than 50% of patients with liver cirrhosis at both necropsy and biopsy **(Newell, 1987).** Glomerulopathy was noted in bilharzial liver fibrosis. It is more frequent with schistosoma mansoni than with schistosoma haematobium. The most common pathological pattern is chronic diffuse membrano proliferative GN although focal glomerulosclerosis is occasionally seen **(Brenner et al, 1987).** Although "Cirrhotic" glomerulonephritis is usually clinically silent disease, the diagnosis can be suspected by finding proteinurea or other abnormalities of the urine **(Newell, 1987)**

In alcoholic cirrhosis IgA glomerulonephritis is frequent, usually non-proliferative and latent, sometimes membranoproliferative. Defective elimination of circulatory immune complexes made up of bacterial or food antigens and immunoglobulin antibodies (IgA, IgG,IgM,IgE) is thought to play a part in pathogenesis of this type of glomerulopathy **(Karmochkine et al, 1989)**. Furthermore iatrogenic renal failure in patient with cirrhosis may occur due-for example-to diuretic overdose, severe diarrhea, non-steroidal anti- inflammotry drugs and nephrotoxic drugs **(Sherlock, 1989).**

Also functional renal failure may occur as terminal events in patient with cirrhosis and ascites. It has been attributed to decrease in renal blood flow, resulting form hypovolaemia, after vigreous diuresis, Abdominal paracentesis or massive bleeding **(sleisenger, 1989)**

AIM OF THE WORK

The aim of this work is to study the renal changes both functional and structural in cirrhotic patients in attempt to correlate the pathophysiology of the liver with that of the kidney in differtent clinical stages of liver cirrhosis with or without bilharziasis.

REVIEW OF LITERATURE

ANATOMY OF THE LIVER

The liver which is the largest organ in the body, weighs 1200 - 1500 gram, and is shaped like a pyramid whose apex reaches xiphisternum (**Sherlock, 1989**). It is situated in the upper and right parts of the abdominal cavity, occupying almost the whole of the right hypochondrium as for as the lateral line (**Warwick and willams, 1980**).

It has two surfaces, diaphragmtic and visceral. The diaphragmatic surface is convex, moulded to the diaphragm, while visceral surface, flat, slopes down to the right and forward too (**Last, 1984**)

The liver is related by its domed upper surface to the diaphragm which separate it from pleura, lungs, pericardium and heart. Its postero- inferior or visceral surface abuts against abdominal oesophagus, the stomach, duodenum, hepatic flexure of the colon and right kidney and suprarenal, (**Ellis, 1971**). the gall bladder rests in a fossa under the right lobe of the liver (**Summerfield, 1978**).

The liver is divided into a large right and a smaller left lobes separated superiorly by the falciform ligament, which connects the liver to the diaphragm and the anterior abdominal wall (**Jones, 1990**), and on the visceral surface by grooves for the ligamentum teres and ligamentum venosus (**Last,1984**). The right lobe being about six times the size of the left lobe. The quadrate and caudate lobes are parts of the left lobe as they are supplied by the left branch of the hepatic artery and portal vein and drain into the left hepatic duct

(Last,1984). Functionnally however, the liver is divided along the plane of the gall bladder and inferior vena cava into two equal halves **(Jones,1990).**

The transverse fissure on porta hepatis is the hilus of the gland for the transit of vessels and ducts **(Wyburn,1972).** Lying in porta hepatis which is two inches long are:

1- The common hepatic duct - anteriorly

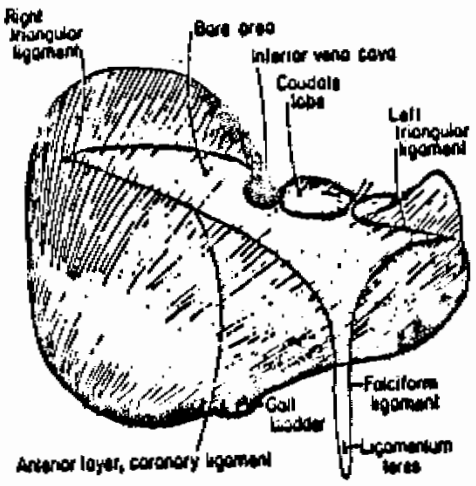
2- The hepatic artery - in the middle

3- The portal vein - posteriorly. **(Ellis, 1971).**

Vascular anatomy of the liver:

The liver has a double blood supply. The portal vein brings venous blood, and the hepatic artery, coming from coeliac axis, supplies the liver with arterial (Oxygenated) blood, these vessels enter the liver through a fissure, the porta hepatis, which lies far back on the inferior sarface of the right loble **(Sherlock, 1989).**

The hepatic artery and portal vein divide in the porta hepatis into equal - sized right and left branches. They lie together as they ramify in each half of the liver, and they are every where accompanied by tributaries of the hepatic duct. There are no communications between right and left halves of the liver; indeed, even within each half the arteries are end - arteries (Last, 1984). The central veins coalesce to form the hepatic veins, which drain into the inferior vena cava. The average transit time for blood across the liver lobule from portal venule to the central heptic vein is about 8.4 seconds **(Ganong, 1985).**



The diaphragmatic surface of the liver, showing the relationships of the hepatic ligaments. (Reproduced from Woodburne AM. Essentials of Human Anatomy, 3rd ed. London, Oxford University Press, 1965:442, with permission.)

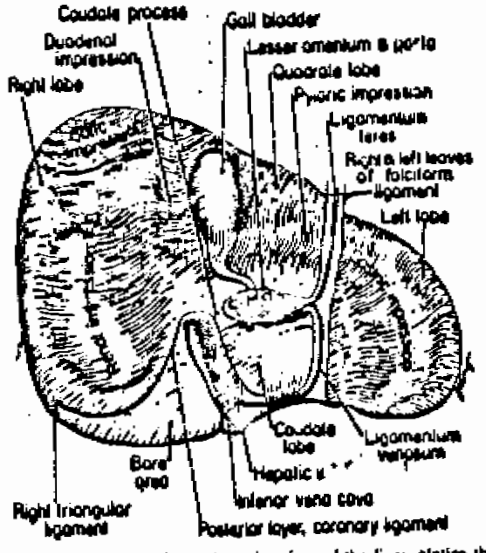


Diagram of the visceral surface of the liver. Notice the H pattern made up of the gallbladder, inferior vena cava, lesser omentum and porta, ligamentum teres, and ligamentum venosum. (Reproduced from Woodburne AM. Essentials of Human Anatomy, 3rd ed. London, Oxford University Press, 1965:442, with permission.)

ANATOMY OF THE KIDNEY

The kidneys are paired organs that lie behind the peritoneum on the posterior abdominal wall. The upper pole of the kidney lies opposite the 12 th thoracic vertebra and the lower pole opposite the 3 rd lumber vertebra **(Craig,1976).**

In the adult, the kidney is about 11 cm in length and 5.7 cm in width. The external surface of the kidney is covered by a capsule which is tough, fibrous and lossely adherent to the surface of the renal parenchyma**(craig,1976).** The lateral surface of the kidney is convex while the medial surface is concave and it contains a slit called the hilus through which pass the renal artery, vein and nerves. Each kidney is usually supplied by a single renal artery which arises form the abdominal aorta. however, there may be more than one renal artery **(Olsson,1986)**

On the cut surface of the kidney, two distinct regions can be identified, an outer glomerular dark area called the cortex and an Inner light area which is the medulla. the medulla is divided Into 8 to 18 renal pyramids. The base of each pyramid is postioned on the cortico-medullary boundary. The apex of each pyramid forms a papilla at which ten to twenty five small openings representing the distal opening of the collecting ducts open into the renal calyces and pelvis **(Craig,1976).**