LIVER CIRRHOSIS
A RISK FACTOR FOR DEVELOPMENT OF CHOLELITHIASIS IN MALES

Thesis

Submitted for Partial Fulfilment of Master Degree in General Medicine

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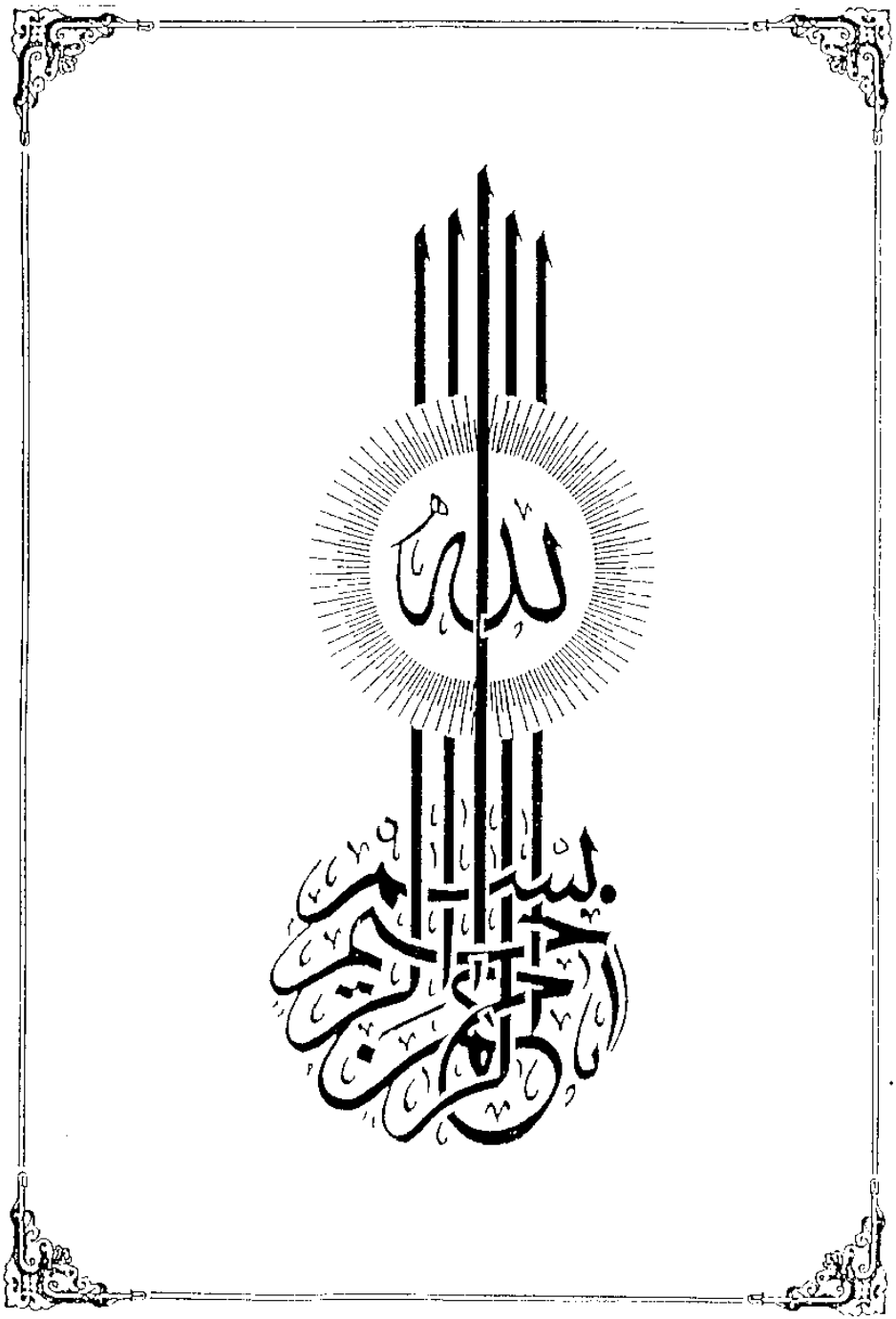
1994

بسم الله الرحمن الرحيم

﴿ وَمَا أُتِيتُمْ مِنَ الْعِلْمِ إِلَّا قَلِيلاً ﴾

"الإسراء ٨٥"



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ACKNOWLEDGEMENT

It is my great honour to express my deep gratitudes and appreciation to : Prof. Dr. Nadia El-Ansary, Prof. of internal medicine, Ain Shams University for kind help and supervision of this work.

I'm also greatly thankful to : Dr. Ragaa Ahmed Salim, Assistant professor of pathology, Ain Shams University for kind help and assistance.

Also, I'm thankful to : Dr. Magdy El-Guinaidy, Lecturer of internal medicine, Ain Shams University for his kind assistance, Dr. Wysam Fahmy Elbaz, lecturer of internal medicine, Ain Shams University for her kind assistance.

INTRODUCTION

REVIEW OF LITERATURE

INTRODUCTION

Liver cirrhosis has been found to be a risk factor for development of cholelithiasis. (Nicholas, 1972)

It has been demonstrated that prevelance of gall stone disease in cirrhotic patients in comparison to controls was significantly higher in males only. (Fornari et al., 1990)

Real time-ultrasonography has proved to be more accurate than oral cholecystography in detecting gall stones, and it represents today, the diagnostic technique of choice.
(Maurer et al., 1989)

Ultrasonographic gall bladder examination is preferable in cirrhotic patients either for higher sensitivity in detecting small stones or frequent poor visualization or non visualization of the gall bladder by oral cholysystography.
(Barbara et al., 1987)

The aim of this work is to study cholelithiasis in cirrhotic patients and to assess it's relation to the sex of the patient.

ANATOMY OF THE GALL BLADDER

The gall bladder is shaped like a pear about 8 cm long and 3 cm at its widest part and has a capacity between 30 and 50 ml. It is described as having fundus, body and neck.

The fundus projects below the inferior border of the liver and comes into contact anteriorly with the posterior surface of the abdominal wall near the tip of the ninth right costal cartilage. It is completely surrounded by peritoneum and posteriorly is in touch with the beginning of the transverse colon (Cunninghams, 1982). The body extends into a narrow neck which continues into the cystic duct. The valves of heister are spiral folds of mucous membrane in the wall of the cystic duct and neck of the gall bladder. The cystic duct lies immediately in front of the right main branch of the hepatic artery.

The fundus and body of the gall bladder are firmly bound to the under surface of the liver by connective tissue and many small cystic veins that pass from the gall bladder to liver substance. It is covered by peritoneum except for the surface that is in direct contact with the liver substance in the gall bladder fossa. (Last, 1985).

ARTERIAL SUPPLY

The gall bladder is supplied by the cystic artery, a branch of the right hepatic artery. It may arise from the main trunk of the hepatic artery or from it's left branch. Also smaller blood vessels enter from the liver through the gall bladder fossa.

VENOUS DRAINAGE

It is by multiple small veins into the substance of the liver and so to the hepatic veins, a cystic vein running into the portal vein is usually also present.

LYMPHATIC DRAINAGE

There are many lymphatic vessels in the submucosal and subperitoneal layers. They drain through the cystic gland at the neck of the gall bladder to glands along the common bile duct, where they anastomose with lymphatics from the head of the pancreas, then ultimately to the pre-aortic and posterior pancreatico-duodenal lymph nodes (Last, 1985).

Nerve Supply :

The innervation of the biliary tract is derived from both vagal (parasympathetic) and sympathetic fibers (Burnett et al., 1964). Vagal fibers travel in the hepatic branch of the anterior (right vagal trunk). Sympathetic fibres come

from the coeliac plexus and supply the smooth muscles of the gall bladder. The afferent fibres responsible for painful sensation from the biliary tract, travel in the sympathetic nerves to the coeliac ganglia and then to the spinal cord. (Aronchic and Brooks, 1985).

Embryology :

The liver and biliary tract develop from a bud like out pouching of the ventral wall of the primitive foregut. Two solid buds of cells form the right and left lobes of the liver while the original diverticulum forms the hepatic and common bile ducts.

The gall bladder arises as a smaller bud of cells from the same diverticulum. At five weeks the ductal communications of gall bladder, cystic duct and hepatic ducts are completed and at three monthes the foetal liver begins to secrete bile (Jakson et al., 1964).

HISTOLOGY

THE GALL BLADDER IS COMPOSED OF THREE LAYERS

1- *Mucosa :*

Formed of columnar cells which are supported by a lamina propria of delicate reticular connective tissue.

The mucosa of the body is projected into minute folds which give it a honey-comb appearance but in the neck they are arranged in a special manner called the spiral valves.

2- *Muscularis :*

Formed of a layer of smooth muscles irregular in thickness with collagenous, reticular and some elastic fibres.

3- *Serosa :*

Formed of dense fibro-connective tissue covered by peritonium (Lesson and Lesson, 1981).

FUNCTION OF THE GALL BLADDER

The gall bladder concentrates and acidifies hepatic bile at an appropriate time after eating. It can store most of the body pool of bile acids. It empties only in response to a meal and maintains a low level of pressure in the billary tract. Transport across the gall bladder mucosa involves movement of sodium chloride against an electrochemical gradient followed by water in response to osmotic gradient. The site of active transport appears to be in the lateral cell membranes. Passive movement can occur between cells in spite of tigh junctions. Some absorption of unconjugated bilirubin and bile acids occurs in the gall bladder. The only known control mechanisms affecting absorption from the gall bladder are the factors that determine how long bile remains in contact with gall bladder mucosa i.e., release of cholecystokinin and the number of cycles of the enterohepatic circulation. The precise mechanism by which the gall bladder acidifies bile is unknown, but secretion of hydrogen ion at the mucosal surface is most likely.

(Aronchick and Brooks, 1985)

NERVOUS CONTROL OF GALL BLADDER

Contraction of the gall bladder occurs reflexly during the cephalic phase of digestion. The afferent limb of the reflex is in the vagus nerve (Leonk Knoebel, 1982). Afferent nerves from the duodenum and other organs may carry impulses arousing or inhibiting vagaly mediated gall bladder and sphincter movements, but such reflexes have not been fully studied. Stimulation of the sympathetic nerves to the gall bladder inhibits the effect of cholecystokinin and vagal stimulation (Fisher et al., 1985). Most investiagators have found the size of the gall bladder in the resting state after truncal vagotomy to be increased by about 2 folds.
(Dramhoft, 1972)

GALL BLADDER DISEASES

Gall Stones :

The formation of gall-stones depends on the production of bile in which cholesterol can't be maintained in micellar form.

This might be related to increased secretion of cholesterol or perhaps to reduction in the total bile acid pool. The gall bladder is important in providing nucleus for stone formation and acting as reservoir allowing growth of the stones.

Stones of the gall bladder are symptomless unless they migrate into the neck of the gall bladder or into the common bile duct.

Migration of the stones to the neck of the gall bladder causes obstruction of the cystic duct resulting in chemical irritation of the gall bladder mucosa by the retained bile and this is followed by bacterial invasion and according to the severity of the changes acute or chronic cholecystitis results (Sherlock 1989).