Histopathological Study of the Gastric Mucosal Changes in Bilharzial Patients and Patients with Viral Hepatitis

Thesis

Submitted by

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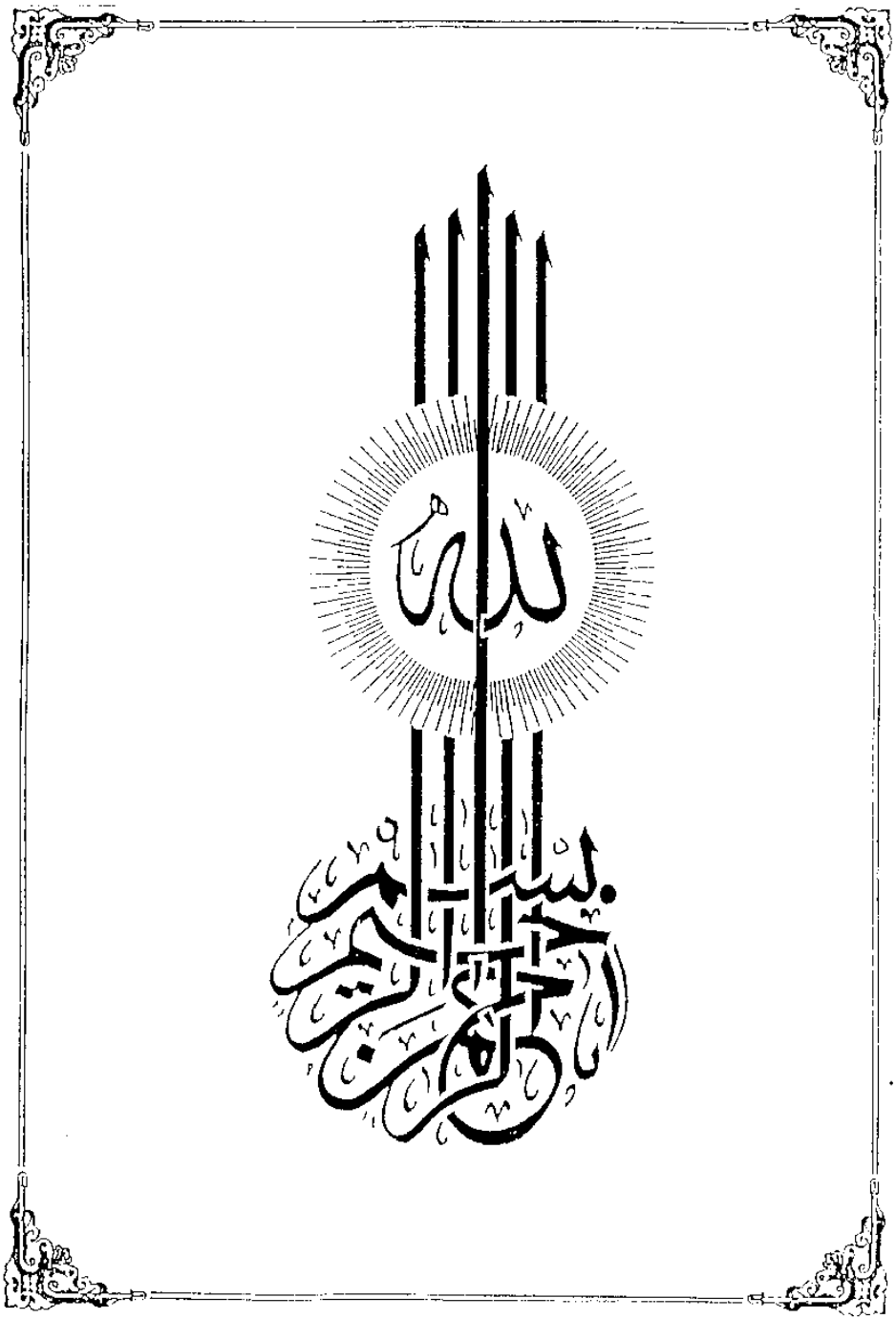

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Introduction and Aim of the Work

Biharziasis is an endemic disease in Egypt. It affects many systems of the body including the alimentary canal which mainly affected by schistosoma mansoni infection. Gastrointestinal disturbances are common presentation in this disease.

Viral hepatitis, which is a multisystem infection involving many organs especially the liver may eventually proceed to chronic liver disease.

The aim of this work is to study the histopathological changes in the gastric mucosa in patients suffering from bilharziasis and patients having chronic viral hepatitis with positive HB_s antigenemia.

Review of Literature

Anatomy of stomach

The stomach is the most dilated part of the alimentary canal, and is situated between the end of the oesophagus and the begining of the small intestine. It lies in the epigastric, umbilical and left hypochondriac regions of the abdomen.

The opening by which the oesophagus communicates with the stomach is the cardiac orifice, and is situated on the left of the median plane, behind the seventh costal cartilage 2.5 cm from its junction with the sternum and at the level of the eleventh thoracic vertebra.

The opening into the duodenum is the pyloric orifice which lies about 1.2 cm to the right of the median plane near the lower border of the first lumbar vertebra, when the body is in the supine position and the stomach is empty.

There are two gastric curvatures: the lesser curvature and the greater one. The former extends between the cardiac and pyloric orifices forming the right border of the stomach. The most dependent part of the curve may form a notch, named the angular incisure, it may be used to separate the stomach into right and left parts.

Anatomic divisions of the stomach. (Williams and Warwick, 1980).

The stomach is divided into: cardiac portion (or fundus), middle, portion (or body), pyloric portion (or (antrum).

Gastroscopy sometimes reveals a structure called the musculus sphincter antri, separating the body from the antrum across the greater curvature. This lip like fold is formed by fibres from muscularis propria. It is not identifiable except in the intact stomach by endoscopy. This fold disappears upon distension of the stomach by air inflation.

The pyloric canal is the narrowed portion of the stomach begining about 2.5 cm proximal to the pyloric ring. The latter is formed by a thick layer of circular muscle fibres and its position is defined on the serosal surface by the pyloric veins.

The pyloric ring or sphincter, while prominent anatomically, has not been demonstrated to have much functional significance in man from physiologic and dynamic stand points. Conversly, the cardiac or gastro-oesophagealsphincter located in the lower end of the oesophagus, 2.5 cm above its junction with stomach, while not always demonstrable anatomically has been shown to play the

most important functional role in the passage of material from the oesophagus to the stomach and in prevention of gastric reflux into the oesophagus. (Guyton, 1982).

Structure of the stomach wall:

The wall of the stomach consists of the four usual layers:
serous, muscular, submucous & mucous, together with their vessels and nerves.

The serosa:

The seroasa, or visceral peritoneum, covers the entire surface of the organ, except along the greater and lesser curvatures at lines of attachments of the greater and lesser omenta and a small area on the postero-inferior surface of the stomach, close to the cardiac orifice.

The muscular coat:

The muscular coat is composed of smooth muscle fibres arranged in three layers the innermost oblique coat, the middle circular coat and the superficial longitudinal coat.

The submucosa:

The submucosa separates the muscularis mucosa of the glandular layer from the internal muscular layer of the stomach. It is composed of loose connective tissue and elastic fibres permitting free mobility of the mucosa with changes in contractility and tonus of muscular coat.

The submucosa contains the blood and lympatic channels supplying the mucosa as well as Meissner's plexus of nerves.

The mucous membrane:

The mucous membrane is thick and its surface is smooth, soft and velvety. It is of a pinkish tinge at the pyloric end, and of a red or reddish brown colour over the rest of its surface. During the contracted state of the organ it is thrown into numerous folds or rugae which for the most part have a longitudinal direction, and are best marked towards the pyloric end of stomach, and along the greater curvature. These folds are obliterated when the organ is distended. The surface of the mucous membrane is covered with a single layer of columnar secretory epithelial cells, the surface mucous cells, which liberate mucous from their apices on the surface of the

stomach. This type of epithelium commences very abruptly at the cardiac orifice, where there is a sudden transition from the stratified epithelium of oesophagus.

The gastric glands comprise:

The cardiac glands, main glands of the body and fundus and pyloric glands.

The cardiac glands are infrequent and confined to a small area near the cardiac orifice, they are lined mainly by mucus-secreting cells.

In the main gastric glands of the body and fundus, at least four distinct cell types have been distinguished.

1) The chief (peptic or zymogenic) cells are present particularly in the basal parts of the glands. These cells secrete pepsinogen.

2) The oxyntic (parietal) cells are present on the side walls and near the duct of the gland. These cells secret hydrochloric acid and also probably the intrinsic factor of Castle.

3) Mucous neck cells particularly numerous around the necks of glands. They are typical mucus-sereting cells.

4) Argentaffin cells: they are more usually in the deeper parts of the gland. They produce serotonin as do the similar cells of the small intestine.

5) Undifferentiated columnar cells are also present in smaller numbers, and these appear to be the origin of new cells to replace the existing ones as they are lost.

C) The pyloric glands:-

The epithelial cells are predominantly mucous in type, oxyntic cells being sparse. The pyloric glands produce the enteric hormone gastrin.

In the mucous membrane, deep to the glands, is a thin stratum of nonstriated muscle fibres the muscularis mucosa , it consists of an inner circular and an outer longitudinal layer, the inner layer sends strands between the glands, the contraction of which probably aids the emptying of the glands.

Blood supply:-

The stomach is supplied by the left gastric artery (from coeliac artery), the right gastric and right gastro-epiploic arteries (from the common hepatic artery), and

the left gastro-epiploic and short gastric arteries (from the splenic artery). These vessels not only anastomose extensively on the serosal surface of the stomach, but they also form anastomotic networks at intramuscular, submucosal and mucosal levels.

The venous blood from the stomach empties in the portal vein. The right and left gastro-epiploic veins draining the greater curvature, enter the portal vein through the superior mesenteric vein and splenic vein respectively. The right and left gastric veins, both drain the lesser curvature and usually drain directly into the portal vein.

At the cardia of the stomach, anastomoses of the left gastric vein and short gastric veins of the portal system with oesophageal veins tributaries of the vena azygos minor of the systemic circulation, take place. In portal hypertension, deviation of blood in these vessels leads to varicosities in the submucous layer of the lower end of oesophagus and upper part of stomach.

Lymphatics of the stomach:

The lymph vessels of the stomach are continuous at the cardiac orifice with those of the oesophagus, and those of the duodenum at the pylorus.

They follow the arteries and are arranged in four main groups:

1) Lymph nodes along the left gastric vessels (superior gastric nodes), from here the lymph passes to the coeliac lymph nodes around the coeliac artery.

2) Lymph nodes along the right gastric vesseles, from here, the lymph goes to lymph nodes along the hepatic artery, and finally to the coeliac group.

3) Lymph nodes along the short gastric arteries and the left gastroepiploic artery, from here the lymph passes to the hilum of the spleen then the pancreatico-splenic lymph nodes along the splenic artery, which also drain into the coeliac nodes.

4) Right gastro-epiploic lymph nodes which lie along the lower part of the greater curvature, from here the lymph passes to the nodes along the gastroduodenal artery, which also drain into the coeliac nodes.

Nerve supply of the stomach:

The stomach is supplied by the autonomic nervous system. The parasympatnetic supply originates in the dorsal vagal nuclei in Medulla Oblongata and reach the stomach by the right posterior and left anterior vagal nerves.