HELICOBACTER PYLORI-ASSOCIATED GASTRITIS IN ANTRUM AND BODY

THESIS

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BY

AHMED MAHMOUD ABOU ALKHEIR

SUPERVISORS

PROF. DR. IBRAHIM ABD ALLAH
PROF. OF INTERNAL MEDICINE
FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY

PROF. DR. SHADIA MABROUK
PROF. OF PATHOLOGY
FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY

DR. MALAK BAHGAT
LECTURER OF INTERNAL MEDICINE
FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY

FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY

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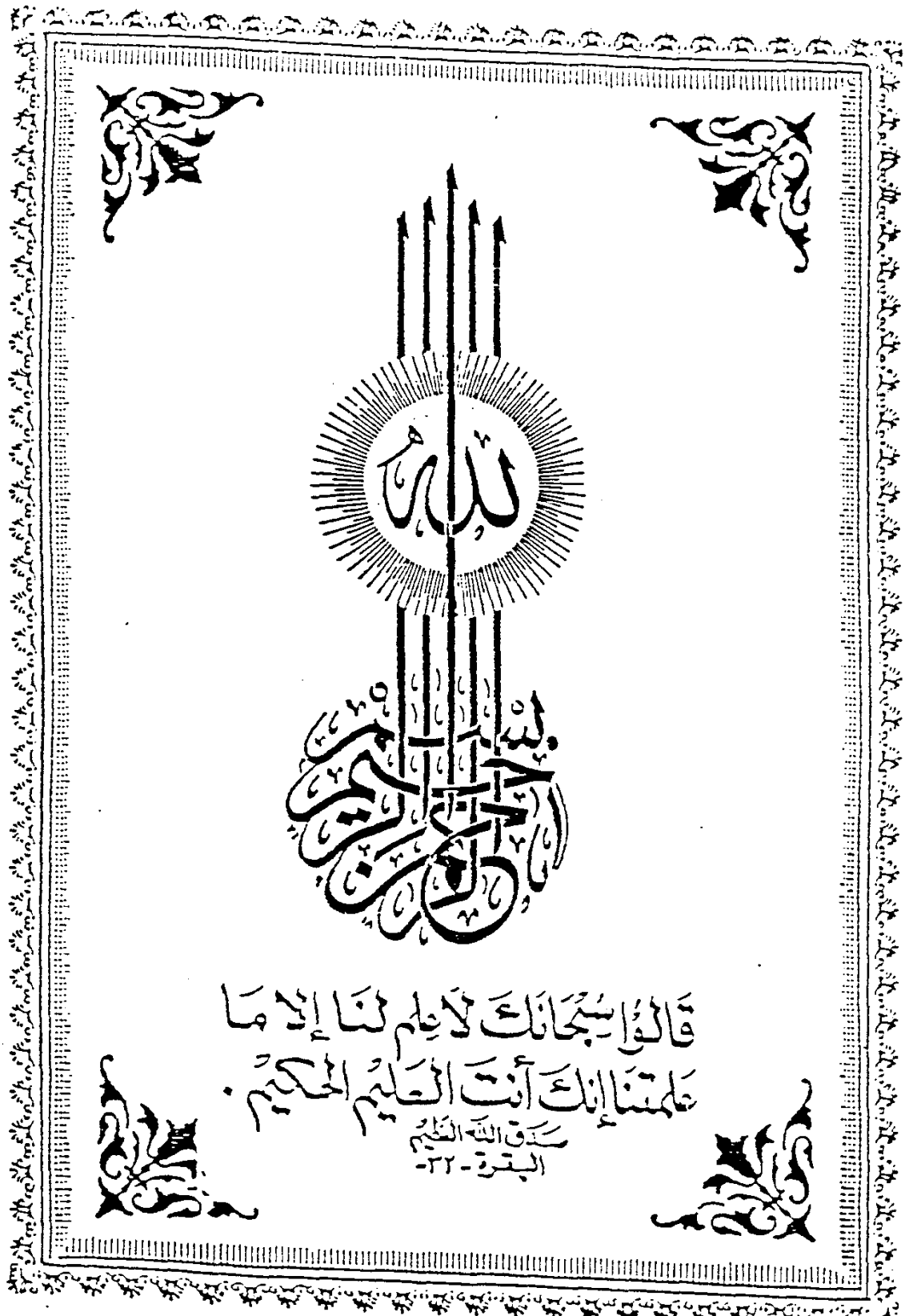

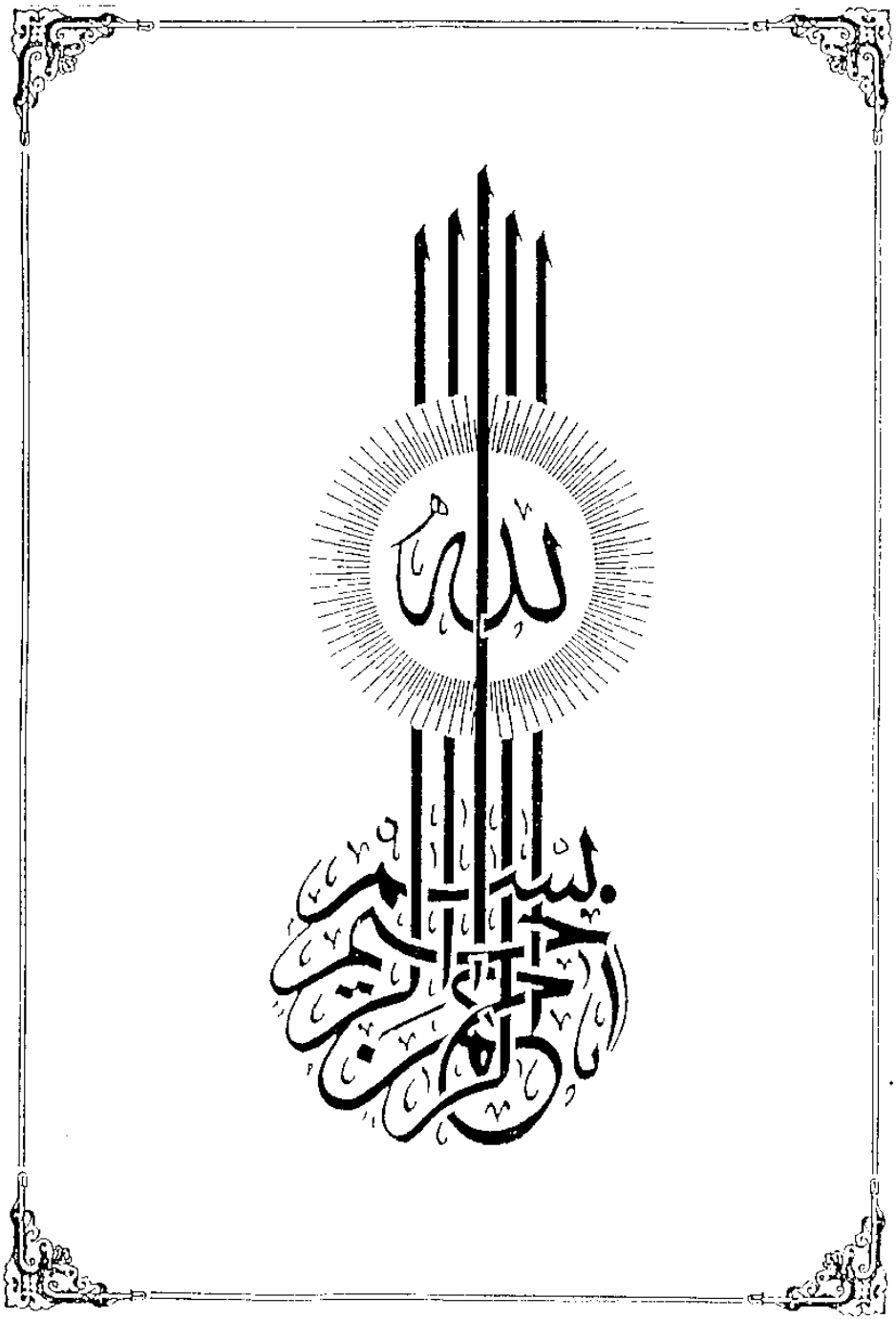

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Helicobacter pylori (HP) is a Gram negative curved - rod shaped bacterium known to cause gastritis.

Since 1987 when Marshall et al., first cultured this organism from chronically inflammed mucosa, evidences have been accumulated that it may be a primary pathogenic factor in the development of active chronic gastritis and duodenal ulcer. But up till now the hypothesis that Helicobacter pylori is a primary pathogenic factor in active chronic gastritis is still controversial. The aim of this work is to elucidate the role of Helicobacter pylori in active chronic gastritis by investigating the frequency of H.P colonization in the antrum, body and fundus and whether there is any relationship between the grade of its colonization and the grade of gastritis.

GASTRITIS

A- GASTRITIS

The term gastritis is applied to the occurrence of inflammatory lesions in gastric mucosa.

1- CLASSIFICATION

Old classification was done by "Vilardil in 1974" when gastritis was classified in to :-

1) Acute gastritis.

2) Chronic gastritis: Which was subdivided into:-

Superficial gastritis.

Atrophic gastritis.

Gastric atrophy.

Recent classification was done by Kumar 1990 who classified gastritis into:-

Type A gastritis.

Type B gastritis.

Type C gastritis.

(Which will be described later on.)

2- HISTOLOGICAL CONSIDERATIONS

The wall of the stomach is formed of four layers:-

The mucosa, submacsa, Musculosa and serosa.

A) The mucosa:

The nacked eye appearance of the inside of the mucosa shows that it is gryish pink in colour thrown into folds called rugae, smooth to touch due to absence of villi and full of minute holes which are the openings of gastric pits (Roland and Thomas, 1976).

The entire thickness is occupied by a mass of gastric glands which open on the surface by gastric pits. The gastric glands are simple tulular or branched tubular and extend deeply to reach the muscularis mucosa. Between them is the lamina propria which is a connective tissue layer between the epithelium and muscularis. The lamina propria contains reticular fibers, some lymphocytes, plasma cells and gastric glands. Also it is the part which contains the blood vesseles, lymphatics and nerves (Abdel Kader, 1982).

The surface epithelium:

This is a simple columnar epithelium formed of mucus secreting columnar cells. It covers the mucosa and is

interrupted by the openings of the ducts of gastric glands where it is invaginated to line them.

The apical parts of the cells appear clear due to its contents of dissolved mucin granules which dissolve during processing.

They secrete neutral mucopolysaccharide material which forms a protective coat for the epithelium. The surface epithelial cells are replaced by mitosis of less differntiated cells situated in the upper region of the gastric glands (Lesson, 1976).

The gastric glands are branched tubular in type densely packed and occupy the entire thickness of the mucosa. They open in small groups into the bottom of gastric pits. There are three types of gastric glands (Ham, 1979).

The fundic glands are the most important glands of the stomach and produce the majority of enzymes and hydrochloric acid and some mucin (Roland and Thamas, 1976).

The cells lining the fundic glands are numerous and the most important of them are the chief cells which secrete

pepsin also the parietal cells secrete free hydrochloric acid and the interensic factor essential for absorption of vitamin B_{12} in the small intestine (Gilbert, 1962).

Other types of cells include mucous neck cells which produce mucin, surface epithelial cells, and enterochromaffin cells which produce serotonin and probably gastrin (Ieeson, 1976).

The pyloric glands are characterized by deep ducts extending to the half of the thicknes of the mucosa. Thus they are short and are simple or branched tubular, but they are of greater diameter than these of fundus and so they are coiled upon themselves with the exception of few parietal cells and enterochromoffin cells, only one cell type is present which is mucus secreting cells (Abel Kader, 1982).

B- Submucosa:

It is a loose connective tissue layer, with blood vesseles, lymphatics and meissners's plexus of nerves, mast cells and eosinophils are also found in this layer (Abdel Kader, 1982).

C- Musculosa:

It is formed of an inner oblique, middle circular and outer longitudinal smooth muscle layer. Auerbachs's plexus of nerves is present in between its outer two thirds (Abel Kader, 1982).

D- Serosa:

It consists of a single layer of mesothelial cells covering a subserous layer of loose connective tissue containing blood vesseles, lymphatics and nerves (Ham, 1979).

3- PROTECTIVE MECHANISMS OF GASTRIC MUCOSA

The gastric mucosa is always exposed to varioues injurious factors that may cause different pathological lesions so there is protective mechanisms of gastric mucosa against lesions as gastritis and ulcer.

A- Mucus bicarbonate barrier:

It provides a fixed layer of relative alkalinity between the surface epithelium and the luminal acid. A PH gradient is established across this layer which for the normal stomach may reduce a luminal PH of 2.0 to PH of 6.0 or higher adjacent to the mucosa (William and Turnberg, 1980).

The integrity of this barrier is dependant upon the ability of the surface epithelial cells to maintain both bicarbonate and mucus secretion.

Flemstrom and Garner, (1982) noted that the rate of bicarbonate secretion is reduced by vasoconstriction by adrenaline, metabolic inhibitors, dinitro phenole and hypoxia and also by inhibition of carbonic anhydrase activity by acetazolamide. Also the mucus layer provides

protection of the cellular layer against mechanical injury. A number of alteration of mucus metabolism have been reported in patients with peptic ulcer. The secretion of mucus and the synthesis of glycoproteins have been shown to be impaired in patients with active gastric ulcers (Younan et al., 1982).

B- Luminal membrane of the surface epithelial cells:

This membrane has a relative impermeability to the diffusion of acid or other small ions (Ivey, 1991). Thus the small amount of acid that may cross the mucus bicarbonate barrier of the normal stomach encounters further resistance to diffusion at the level of cell membrane. This barrier is also dependant upon the functional integrity of the cell. Thus, conditions such as hypoxia affect this barrier and may be seen to induce an increase in the rate of back diffusion of H^+ ion (Birkett and Silen, 1972).

C- Active stabilization of intracellular PH:

The gastric epithelium is capable of actively neutralizing H^+ ions that have back diffused into it, by processes based on the Co_2 / Bicarbonate buffer system.