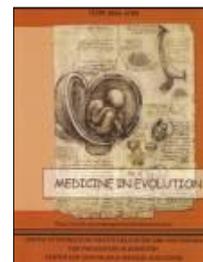


ABDOMINAL ULTRASOUND EXAMINATION, POSSIBLE SCREENING METHOD IN HELICOBACTER PYLORY POSITIVE GASTRIC DYSPEPSIA



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ABSTRACT

The present study started from the hypothesis that the presence of Helicobacter pylori bacterium in the antral gastric mucosa causes a series of changes that may suggest its presence and may be detected by ultrasound examination.

The goal was to make a statistical correlation between the thickness of the hypoechoic halo ("cockade rosette" image) of the gastric antrum and the presence of Helicobacter pylori (HP).

A group of 150 subjects with dyspeptic symptoms were examined in whom an image of the antrum with a 6-10 mm thickness hypoechoic halo was visible.

In 111 (74%) the HP test was positive.

Key words: *Helicobacter pylori, gastric dyspepsia, antrum, hypoechoic halo, ultrasound screening*

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INTRODUCTION

Helicobacter pylori is a bacterium infecting the gastric, duodenal and even intestinal mucosa. Around 50% of the world population is affected and 80% of them may also be asymptomatic carriers. The infection is more prevalent in developing countries, in very crowded communities with poor hygiene, having also a familial character.

Despite its identification as early as 1875 by German scientists, it was only in 1981 that Barry Marshall managed to isolate the bacterium in the stomach and to cultivate it on culture media (fig.1).

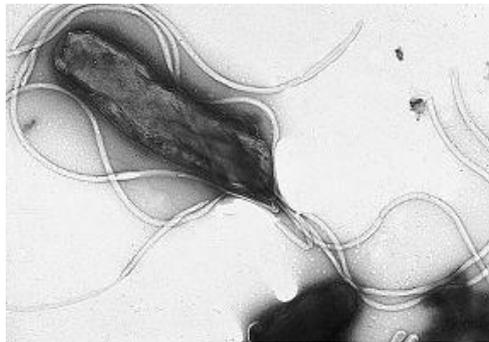


Fig.1 *Helicobacter pylori*; Scientific classification:

Regnum: Bacteria
 Phylum: Proteobacteria
 Class: Epsilon Proteobacteria
 Order: Campylobacterales
 Family: Helicobacteraceae
 Genus: 'Helicobacter'
 Species: "H. pylori"

HP is well adapted to the body response against bacterial infection, having unique characters enabling it to enter the mucus, especially in the antral area and to attach itself to epithelial cells, achieving a persistent colonization which will cause a continuous inflammation of the gastric mucosa with polymorphonuclear cells and lymphocytes. In time, the gastric structures will be affected starting with the mu-

cosa (epithelium, lamina propria), mucosal muscles, submucosa (fig.2)

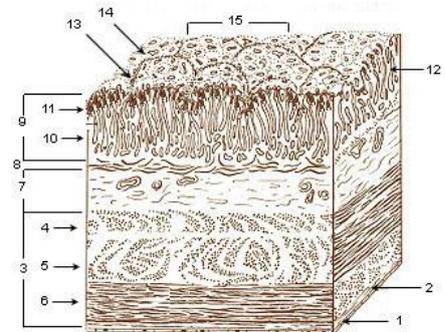


Fig.2

1. Serosa; 2. Tela subserosa; 3. Muscularis;
 4. Oblique fibers of muscle wall; 5. Circular muscle layer; 6. Longitudinal muscle layer;
 7. Submucosa; 8. Lamina muscularis mucosae;
 9. Mucosa; 10. Lamina propria; 11. Epithelium;
 12. Gastric glands; 13. Gastric pits; 14. Villous folds; 15. Gastric areas (gastric surface)

According to some authors the infection might be acquired during childhood, the bacterium having the capacity to survive in the extremely acid gastric environment and it resides in the gastric mucosa for an impressively long period.

During the acute stage many neutrophils are present intraepithelially, in the lamina propria or in the glandular lumen and during the chronic stage which may persist for decades immunocompetent lymphocytes (antigen-reactive cells) and plasmocytes are present.

The neutrophils are those which cause the mild or severe degree of the inflammatory process in the gastric epithelium (cellular oedema), which expands into the deeper layers to the gastric glands and muscular layer of the mucosa.

The inflammatory process may be echographically interpreted based upon the "cockade rosette" image of

the gastric antrum obtained by epigastric sagittal median section correlated to the thickness of the hypoechoic halo which is normally around 4-5 mm. Dimensions between 6 and 10 mm suggest that this process may be induced

by the presence of HP. An increase in the thickness of the gastric wall with a hypoechoic aspect of over 10 mm is also encountered in Menetrier gastritis, granulomatous gastritis or after long term treatments with NSAID drugs.

MATERIAL AND METHOD

The study was conducted for a two year period (May 2009 – May 2011) and it included a group of 250 subjects aged between 30 and 50 years, with an even gender distribution, out of whom, based upon echographic and clinical examination, two subgroups were designed.

Subgroup A, composed of 150 patients with dyspeptic symptoms and 6-10 mm thickness of the hypoechoic layer of the gastric antrum and subgroup B, the control subgroup, composed of 100 subjects without dyspeptic symptoms and with a normal thickness of the hypoechoic layer, i.e. 4-5 mm.

The echographic examination was performed with a 3.5 MHz gamma transducer, with the fasting patient placed in dorsal decubitus and with prior administration of carbo medicinalis the day before the examination.

One of the assessed parameters was the thickness of the antral hypoechoic halo visualized by epigastric sagittal, oblique and transversal sections.

In all subjects a second parameter was indicated and monitored, namely the test for the detection of *Helicobacter pylori* serum antibodies.

RESULTS

The obtained results were analyzed depending on the three monitored parameters: clinical symptoms, the thick-

ness of the hypoechoic halo and the presence of the *Helicobacter pylori* bacterium detected by serological testing.

Table 1 Studied parameters

Subgroup Parameters	A		B	
	present	absent	present	absent
Dyspeptic syndrome	150	-	-	100
<i>Helicobacter pylori</i>	111	39	21	79
Thickness of the hypoechoic layer	6-10 mm		4-5 mm	

The clinical symptoms were found in all the 150 patients in subgroup A and in each subject at least three of the following were present: epigastric pain,

heartburn, early satiety, full stomach sensation after meals, abdominal distension, nausea, vomit. In subgroup B,

subjects with no dyspeptic symptoms were selected.

The HP screening performed in the entire group of 250 subjects revealed that in subgroup A the bacterium was present in 111 subjects (75%) and in subgroup B in 21 subjects (21%). The positive serologic test in 21 subjects of subgroup B with no symptoms and with normal thickness of the hypoechoic layer may be explained by the long lasting action of the bacterium on

the gastric mucosa, these subjects being considered as healthy carriers.

In the 39 patients in subgroup A (26%) with negative serologic results, the digestive symptoms and the thickness of the hypoechoic layer might have been produced by other causes such as: excessive alcohol, tobacco, condiments consumption, infections with alpha-hemolytic Streptococcus, Staphylococcus, etc., digestive candidosis, viral infections, parasite infestation, NSAID drugs fig. 3, 4, 5, 6, 7.



Fig.3 11mm halo, HP present

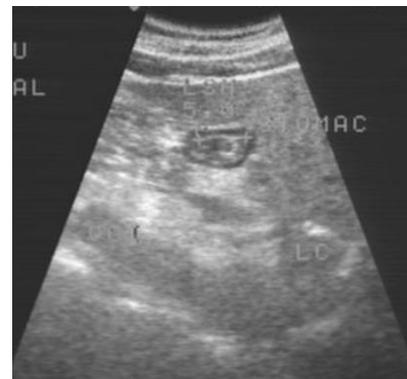


Fig.4 normal halo



Fig.5 8.5 mm halo, HP present



Fig.6 9.5 mm halo, HP present



Fig.7 10.8 mm halo after long term treatment with NSAID

CONCLUSIONS

1. Abdominal echography may represent an effective method useful for primary health care physicians for the prevention of severe diseases produced by *Helicobacter pylori* as well as of complications of gastric ulcer, intestinal metaplasia and gastric carcinoma;
2. The thickness of the hypoechogenic gastric antrum, echographically visualized, might be an indicator during the diagnostic process of *Helicobacter pylori* infection;
3. Combining echographic and clinical information completed by paraclinical investigation (serologic test) may be labeled as screening tests for the detection of *Helicobacter pylori* infection;
4. A normal thickness of the hypoechogenic layer of the gastric antrum does not rule out the presence of *Helicobacter pylori*.

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