HISTOPATHOLOGICAL ASPECTS OF GASTRITIS IN CHILDREN

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ABSTRACT

Introduction Gastritis are particularly important in paediatric pathology in Romania, considering the large number of hospitalized cases in recent years and also the trend of increasing incidence of disease. **Objectives** The authors have proposed to investigate a homogeneous group of patients diagnosed with different types of gastritis, in order to identify those bacteriological, endoscopic and histopathological features that can change the vision about optimal therapeutic attitude, prognosis and disease progression. **Methods** We studied a group of 96 patients who were hospitalized in V[th] Paediatrics Clinic, Children's Emergency Hospital "Sf. Maria", Iasi, between January 2008 and December 2010 who have been diagnosed with various forms of gastritis. The final diagnosis was confirmed endoscopically, bacteriologically and histopathologically. **Results** Histopathological examination revealed the presence of *H. pylori* and also microscopic lesions that were assessed according to Sydney System. The associated microscopic lesions were exclusively of chronic gastritis. Mild form of disease was much rarer for *H. pylori* infection (5.26%) compared with *H. pylori* negative group (54.34%).The presence of lymphoid follicles was more frequently objectified in *H. pylori*-positive group (28.94%) compared with *H. pylori*-negative group (8.69%). In the *H. pylori*-positive group, the moderately-active form prevailed (31.57%), followed by follicular active form (28.94%) and massive active form (13.15%), while in the *H. pylori*-negative group most frequently was mild chronic gastritis (54.34%). **Conclusions** Histopathological examination presents a high relevance in assessing microscopic gastric mucosal lesions and also their evolution after treatment.

Keywords: helicobacter pylori, gastritis, histopathology

INTRODUCTION

Gastritis are particularly important in paediatric pathology in Romania, considering the large number of hospitalized cases in recent years and also the trend of increasing incidence of disease [1].

If in 2008 were diagnosed 230 (19.7%) cases of gastritis, in 2009 the number increased to 416 (35.6%), so that in 2010 number of diagnosed cases reach 524 (44.8%). It is observed clearly an increase to incidence disease in the three years of study, last year including more than 40% of all cases investigated (Table I, Fig. 1).

MATERIAL AND METHOD

We studied a group of 96 patients who were hospitalized in our service between January 2008 and December 2010 who have been diagnosed with various forms of

gastritis. The essential criterion for inclusion in the study was definite diagnosis of the disease by performing upper gastrointestinal endoscopy with biopsy sampling of gastric mucosa from each subject. The final diagnosis was confirmed endoscopically, bacteriologically and histopathologically.

Histopathological examination was made in the Laboratory of Pathological Anatomy of our hospital.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2008	230	19.7	19.7	19.7
	2009	416	35.6	35.6	55.2
	2010	524	44.8	44.8	100.0
	Total	1170	100.0	100.0	

Table I. The incidence of the disease in the period 2008-2010

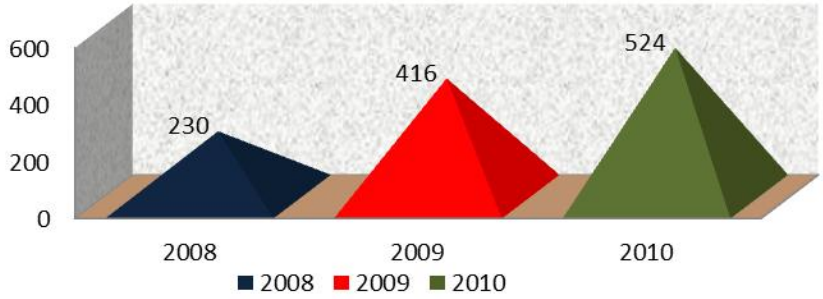

Fig. 1. The incidence of the disease in the period 2008-2010

Fragments of gastric mucosa (antral and/or fundic) fixed in absolute ethylic alcohol were further processed into paraffin inclusion technique. Solidified paraffin blocks were sectioned using a microtome, obtaining 4-5μm thick sections which were spread on microscope slides provided with an adhesive (albumin or gelatine).

Histological sections were stained by the classical method (hematoxylin-eosin) to examine gastric mucosal lesions and by the modified Giemsa method (Giemsa-slow) for evidence of *H. pylori* bacteria.

By optical microscopy it has been established the type of gastric mucosa (antral and/or fundic) and the lesions of gastritis have been evaluated after Sydney classification criteria.

According to histological department Sydney System [2, 3] assessing of microscopic lesions was done according to: the existence of gastritis (defined as the presence of inflammatory infiltrate which was classified as mild, moderate or massive), the activity of gastritis (reflected by the presence of polymorphonuclears in inflammatory infiltrate), the presence of lymphoid follicles and lymphoid micronodules, the presence of outbreaks of intestinal metaplasia, the presence of gastric mucosal atrophy (the loss of specialized glands both from the antrum and from the fundus), the presence of *H. pylori* bacteria in the mucus from the surface (epithelial coverage and cryptic epithelium), the slow Giemsa stain and/or hematoxylin-eosin staining in.

RESULTS AND DISCUSSIONS

Histopathological examination was performed in a group of 96 subjects. Of the 96 gastric mucosal biopsies, 12 were inconclusive (too small fragments, dispersed fragments in paraffin), 71 were from the antral region and 13 from fundic region

(Table II).

Complementary examinations to identify bacteria (urease test and microscopic smear examination or culture) revealed the presence of *Helicobacter pylori* in 38 out of 84 subjects who could make a correct anatomo-pathological examination.

Of the 38 concordant positive samples (by urease test, microscopic smear examination and/or culture) to which anatomo-pathological examination has been made, the presence of *H. pylori* bacteria was observed only in 28 cases, the sensitivity of this method being of 73.68 %.

Of the 84 cases studied by histopathological examination, 6 cases were false positive, being negative by other methods of identification of bacteria. According to criteria of positive diagnosis, these 6 cases were considered as negative, the specificity of anatomo-pathological examination being of 88.46 %.

Examination of the samples revealed the presence of *H. pylori* bacteria (Fig. 2) and also microscopic lesions were assessed according to Sydney System [2] and were assigned to different types of gastritis (Fig. 3-6, Table III).

The type of the gastric mucosa	Positive cases	Negative cases
Antral	34/38	37/46
Fundus	4/38	9/46

Table II. The origin of fragments for histopathological examination

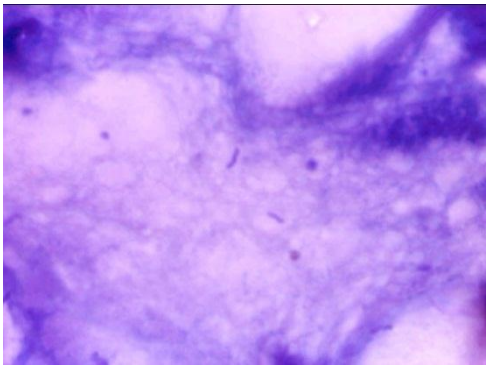

Fig. 2. *H. pylori* in histological section of the gastric mucosa stained Giemsa (1000x)

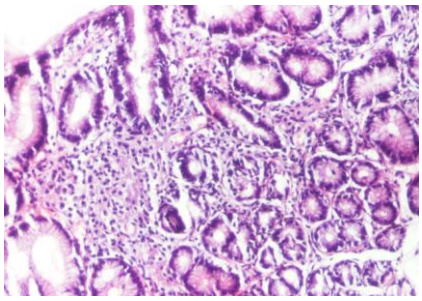

Fig. 3. Chronic antral gastritis, mild active form (200x)

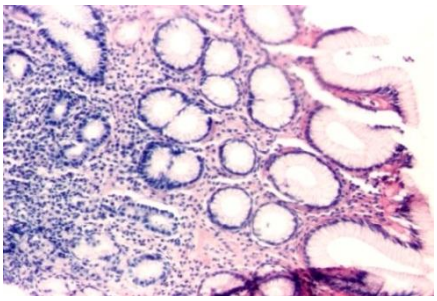

Fig. 4. Chronic antral gastritis, moderately active form (200x)

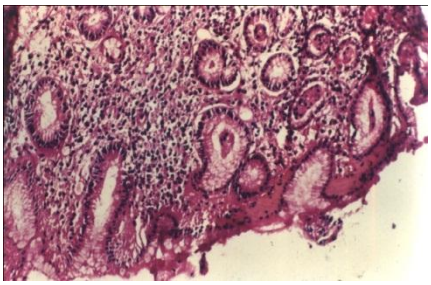

Fig. 5. Chronic antral gastritis, active massive form (200x)

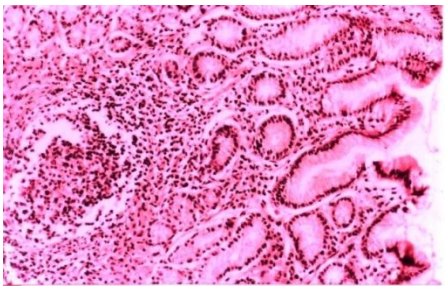

Fig. 6. Chronic antral gastritis with lymphoid follicles (200x)

Sydney System incorporates a logical combination between aetiology, topography and morphology. In morphology are recognized: acute gastritis with polymorphonuclears predominance of the inflammatory infiltrate, chronic gastritis predominance of lymphocytes and plasma cells in inflammatory infiltrate, special forms of gastritis with characteristic histological aspects (granulomatous gastritis, reactive, eosinophilic, lymphocytic, etc.) [4, 5, 6].

Note that in all cases studied there were microscopic lesions of the gastric mucosa, normal appearance not found in any of the patients.

In both groups, group I (*H. pylori* positive) and group II (*H. pylori* negative), associated microscopic lesions were exclusively of chronic gastritis (evidenced by the presence of inflammatory infiltrate of lymphoplasmacytic type), changes of acute gastritis (evidenced by the presence of inflammatory infiltrate of polymorphonuclear type) not being retrieved in this study (Fig. 7).

Histopathological lesions	***No. cases (%)*** *H. pylori* positive	***No. cases (%)*** *H. pylori* negative
Diffuse chronic gastritis, mild - active form	1 (2.63%)	14 (30.43)
Diffuse chronic gastritis, mild - inactive form	1 (2.63%)	11 (23.91)
Chronic gastritis, moderately - active form	12 (31.57%)	8 (17.39)
Chronic gastritis, moderately - inactive form	1 (2.63%)	9 (19.57)
Chronic gastritis, massive - active form	5 (13.15%)	0 (0%)
Chronic gastritis with lymphoid follicles - active	11 (28.94%)	3 (6.52)
Chronic gastritis with lymphoid follicles - inactive	0 (0%)	1 (2.17)
Nodular chronic gastritis - moderately active form	4 (10.52%)	0 (0%)
Haemorrhagic-erosive chronic gastritis - moderately active form	2 (5.26%)	0 (0%)
Haemorrhagic chronic gastritis - severe, active form	1 (2.63%)	0 (0%)

Table III. Histopathological aspects seen in *H. pylori* infection compared with *H. pylori* negative group

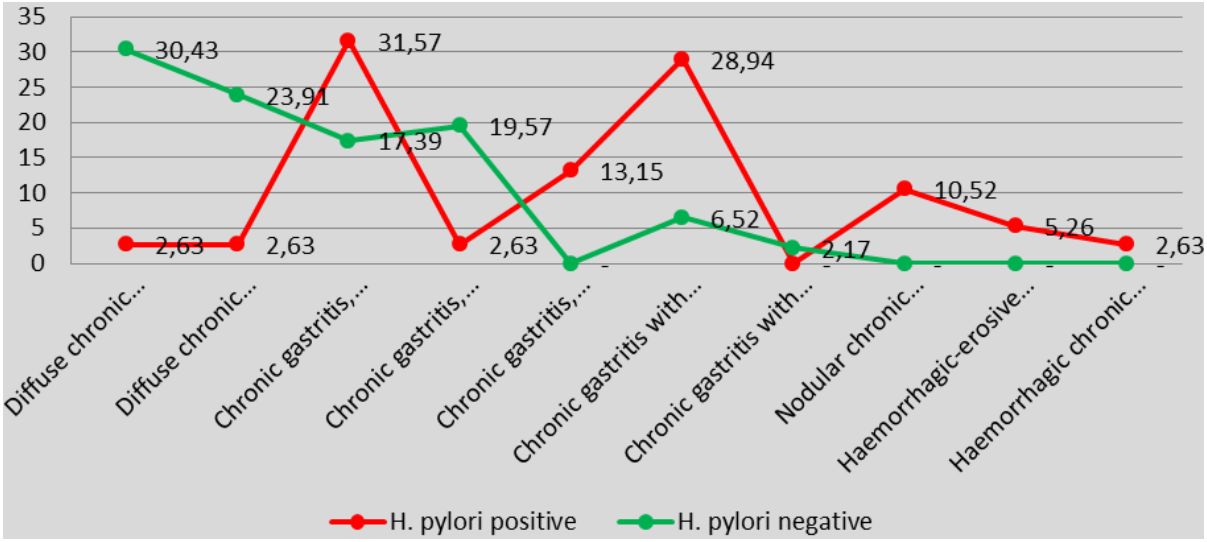

Fig. 7. The distribution of gastritis forms in the two groups

Mild form of disease was much more rare for *H. pylori* infection (5.26%) compared with *H. pylori* negative group (54.34%).

The presence of lymphoid follicles was more frequently objectified in *H. pylori*-positive group (28.94%) compared with *H. pylori*-negative group (8.69%), in the last case the difference was statistically significant ($\chi^2 = 17.81$; $df = 1$ $p < 0.001$).

In the *H. pylori*-positive group the moderately-active form (31.57%) of gastritis prevailed, followed by follicular active form (28.94%) and massive active form (13.15%).

In the group of *H. pylori*-negative, the mild gastritis has occupied first place in frequency (54.34%), followed by moderate form (36.96%) and follicular form (8.69%).

In patients chronically infected, active form prevailed with the presence of PMN (94.7%),while in *H. pylori* negative group only 54.34% of cases were diagnosed with chronic active gastritis, statistical analysis showing a significant difference between the 2 groups ($\chi^2 = 11.06$; $df = 1$ $p < 0.001$).

Not established any correlation between histopathological and endoscopic diagnosis in any of the analysed lots, result consistent with data from the specialized literature [7, 8].

Published studies highlight that *H. pylori*-positive patients often have chronic gastritis lesions, as confirmed in the present research and those *H. pylori*-negative presents particularly injuries of acute gastritis, inconsistent with our results achieved on a relatively small group of patients [9].

A scientific analysis made in Iran on children (124 cases) aged 1-15 years shows that the anatomo-pathological examination has objectified to H. pylori - positive cases the moderate form of gastritis to 53.6% of them, the mild form to 41.4 % and massive form to 4.8%, similar results to those obtained by us [10].

In *H. pylori* gastritis (94.7%) prevailed active form with the presence of PMN, aspect noted in the specialized literature [9, 10].

There are researches which demonstrate that the lymphoid follicles are a feature commonly found in children, its corresponding endoscopic images of nodular antral gastritis [11, 12, 13]. In our case, the presence of lymphoid follicles was common in *H. pylori*-positive group (28.94%) and less frequently in group II (8.69%), consistent with other studies [13].

The presence of *H. pylori* bacteria was observed in histopathological examination only in 73.68% of cases consistent positive by urease test and microscopic smear examination. The explanation for this difference could be related to both the uneven distribution of bacteria in gastric mucosa and that some examined fragments were from the fundic region, this region can sometimes be colonized by fewer bacteria (which cannot be found by microscopic examination) compared with antral region.

Bacteria generally prefer the antrum because are lacking parietal cells and the environment on the surface of the epithelium is alkaline. When acid secretion is inhibited by proton pump inhibitors, the bacteria migrate to the gastric body. Improvement of antral gastritis after treatment with proton pump inhibitors does not mean eradication of infection. Improvement of antral gastritis is followed by worsening of corporeal gastritis, which suggested the characteristic appearance of cobra skin in this region observed in control endoscopy [14, 15].

CONCLUSIONS

Histopathological examination had a sensitivity of 73.68% and a specificity of 88.46% and was particularly important in detecting *H. pylori* infection and the microscopic lesions appreciation of gastric mucosal and their evolution under treatment.

H. pylori gastritis has histologically associated active forms (94.7%) of chronic

gastritides with the predominant of follicular form (36.96%), moderately active (31.57%) and massive active (13.15%), while that in *H. pylori*-negative group prevailed the inactive form and mild inflammation of the gastric mucosa (54.34%).

We found no correlation between anatomo-pathological diagnosis and the endoscopical one in any of studied groups.

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