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Original Research Paper Pathology

Chronic Gastritis: Helicobacter pylori Infection : A Clinico-Endoscopic and Histological evaluation

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ABSTRACT

Aims : *To determine that H. pylori is a major etiologic organism in the pathogenesis of chronic gastritis, peptic ulcer disease and the development of gastric carcinoma and lymphoma. To study the comparative role of endoscopy and histopathology in the evaluation of patients with chronic gastritis and assess the graded variables of Helicobacter associated gastritis.*

Methods: *This study was conducted on 106 patients presented with clinical complaints pertaining that of chronic gastritis. Endoscopic examination as well as biopsy specimens from gastric mucosa were studied in all the cases for the various mucosal lesions observed in patients of chronic gastritis, and prevalence of H. pylori colonization has been established.*

Results: *On endoscopy we observed normal looking mucosa in 24 cases (22.64%), erythema/hyperemia in 50 (47.17%) cases, erosions in 11 (10.37%) patients, ulcerations in 06 (5.66%) patients, nodularity in 04 (3.77%) and mucosal atrophy as well as rugal hyperplasia were detected in 06 (5.66%) and 05 (4.73%) patients respectively. So endoscopic gastritis was observed in 82 (77.36%) cases out of total 106 cases. Histologically, we observed mononuclear inflammatory cellular infiltrates in 100 (94.34%) cases, out of total 106 patients of chronic gastritis included in this study, while 6 (5.66%) cases did not show any infiltrate. As far as the intensity (inflammation) of these infiltrates is concerned we observed - Grade 0 gastritis - Absent inflammation in 6 cases (6.00%), Grade 1 gastritis -Mild inflammation in 66 (66%) cases, Grade 2 gastritis - Moderate inflammation in 17 (17%) patients and Grade 3 gastritis -Severe inflammation in 11 (11%) patients. Histologically gastritis was detected in 100 cases out of total 106 patients. Apart from this, we observed, lymphoid follicles with germinal centre formation in 8 cases, active inflammation with neutrophil infiltration in 12 cases, mucosal glandular atrophy in 9 cases, intestinal metaplasia in 3 and dyplasia in 2 cases respectively.*

Conclusion: H. pylori *associated gastritis is the predominant type of gastritis. It is concluded that* ***H. pylori*** *colonization was found in the majority of the biopsies, and the accurate endoscopic and histopathological examination of gastritis according to the Sydney grading system is a valuable indicator of* ***H. pylori*** *infection.*

KEYWORDS : Helicobactor pylori, Gastric endoscopy, Antral Gastritis, Chronic gastritis. H. pylori gastritis.

Introduction:

There are studies with evidences indicating that *Helicobacter* pylori play role in the pathogenesis of chronic gastritis[1-3], peptic ulcer disease[4-7]. Prevalence of *Helicobacter pylori* is higher[6] in developing countries than industrialised countries. In developing countries *H. pylori* infection occurs at an early age.[8] *Helicobacter pylori* is a gram negative spiral organism, highly motile organism characterized by an abundant production of urease.[9] It was first isolated from the antral mucosa in 1983 by Marshall, and Warren.[10] Interest in this organism has developed because of a close relationship between *H. Pylori* infection and various gastrointestinal disorders. It has been established a major cause of chronic gastritis affecting approximately 50% of the world population and is important in the pathogenesis of gastric adenocarcinoma and gastric lymphoma[11-13]. Studies reported that the prevalence ranges from less than 15% in some populations to virtually 100%, depending on socio-economic status and country development, more in low socio-economic population [14-15]. It has been concluded by National Institute of Health that infected patient with *H. Pylori* should receive antimicrobial therapy as risk of ulcer recurrence and other complications do not diminish unless H. Pylori infection is cured[16-17]. *H. pylori* causes active chronic inflammation in the gastric mucosa[18] and chronic inflammation play an important role in the development of various malignant conditions, particularly in gastrointestinal system[19]. So understanding the pathogenesis of H. Pylori induced gastric carcinoma may improve risk stratification for prevention and therapy[20-21] .

The evaluation of a patient of chronic gastritis involve clinical examination, endoscopic and histopathological examination. Sydney grading system of chronic gastritis and its upgraded Houston version (1996) is the commonly used nomenclature for gastritis and still remain inconsistent. This study has been carried out in the Department of pathology in Government medical college Saharanpur, Uttar Pradesh, India. The aim of this study is to correlate clinical data of patient with endoscopic findings and histological confirmation as well as grading of the gastritis according to the 1996 Sydney grading system.

Material & Methods:

Patient selection & history:

This study has been carried out in the department of pathology and gastroenterology, in Government medical college Saharanpur, Uttar Pradesh, India. Total 106 patients are evaluated during the 3 years period i.e. from January 2014 to December 2016. Most common complains of all the patients were heart burn, epigastric pain, vomitting, nausea, dyspepsia, fullness in epigastrium, flatulence and variable bowel upsets. Some patients had history of weight loss, malaena and loss of appetite, melaese, fever off and on as well as not feeling well in general . These are the patients who did not have history of alcoholism, smoking, and tobacco chewing.

Clinical work up:

Patients were examined clinically, most of the patients found to have epigastrial tenderness otherwise clinical examination was unremarkable. Varoius routine laboratory investigations were done including complete blood counts, liver function test, renal function test, bleeding and coagulation studies as well as abdominal ultrasonography. Then the patients were underwent for upper gastrointestinal endoscopy.

Endoscopy:

Endoscopy was performed under general anaesthesia with GIF –Q 40 fiberoptic gastroscope. From each patient biopsies were taken from three different sites one from gastric antrum 2-3 c.m. proximal to the pylorus, one from corpus along anterior wall of greater curvature and one from the fundus. The approximate size of each biopsy was 0.4-0.6 X 0.2-0.3 c.m. If the gastric mucosa was pink in color, smooth and lustrous, it was considered a normal endoscopic finding and normally the antrum is flat, folds of corpus were flattened on air insufflation, showing a smooth surface. Simultaneously the mucosa were examined for presence of findings suggestive of endoscopic gastritis as erythema, hyperaemia, atrophy, mucosal nodularity, gastric erosions.

Histopathology:

Biopsies were collected and placed on filter papers, fixed in 10% formalin and paraffin embedded blocks were prepared and tissue sections of 3 µ thickness were obtained. One – two slides were stained for routine H&E for histopathological examination and one slide for Giemsa stain for detection of *H. pylori* in gastric mucosa.

The H&E stained sections were examined for [22] –

(I) The intensity of mononuclear inflammatory cell infiltrate
(ii) Inflammatory activity
(iii) Glandular atrophy
(iv) Metaplasia
(v) Dysplasia

Cases of chronic gastritis were graded according to the grading system provided by Houston-updated Sydney system [23] which was depended on the intensity of mononuclear inflammatory cellular infiltrates within the lamina propria into four scales as-

(I) Grade 0 - Absent inflammation
(ii) Grade 1 - Mild inflammation
(iii) Grade 2 - Moderate inflammation
(iv) Grade 3 - Severe inflammation

Results:

This study has been carried out in the Department of pathology and gastroenterology in Government medical college Saharanpur, Uttar Pradesh, India. A total of 106 patients are evaluated during the 3 years period i.e. from January 2014 to December 2016. Patients age ranged from 25 years to 75 years with maximum numbers 39 (36.79%) of patients in between 36-45 years of age while 42 (39.62%) were male and 64 (60.38%) were female patients. Table no. 1 shows Age and Sex distribution of the patients.

Table 1: Age and Sex distribution of the Patients

S.No.	Age Groups (Years)	Number of Patients	Male Patients	Female Patients
1.	25- 35	12 (11.33%)	04	08
2.	36-45	39 (36.79%)	14	25
3.	46-55	22 (20.75%)	09	13
4.	56-65	17 (16.04%)	06	11
5.	66-75	16 (15.09%)	09	07
	Total	106 (100%)	42 (39.62%)	64(60.38%)

Endoscopic Findings :

Endoscopic findings of *H. Pylori* induced chronic gastritis [24] may be-

(I) Normal appearing gastric mucosa
(ii) Erythema (redness, hyperaemia) with granularity
(iii) Exudates
(iv) Mucosal atrophy
(v) Rugal hyperplasia which occure in massive infection, usually pangastritis
(vi) Mottled yellow mucosal appearance suggestive of intestinal metaplasia

Out of total 106 patients, having clinical features of chronic gastritis, normal looking mucosa observed in 24 cases (22.64%), erythema/hyperemia in 50 (47.17%) cases, erosions in 11 (10.37%) patients, ulcerations in 06 (5.66%) patients, nodularity in 04 (3.77%) and mucosal atrophy as well as rugal hyperplasia were detected in 06 (5.66%) and 05 (4.73%) patients respectively. So endoscopic gastritis was observed in 82 (77.36%) cases out of total 106 casaes. Table no. 2, shows endoscopic findings in 106 cases.

Table 2: shows various endoscopic findings in 106 patients having chronic gastritis

S. No.	Endoscopic findings	Total no. of patients (%)	No. of male patients	No. of female patients
1.	Normal looking mucosa	24 (22.64%)	07 (6.60%)	17 (16.04%)
2.	Erythemia/hyperemia	50 (47.17%)	18 (16.98%)	32 (30.18%)
3.	Erosions	11 (10.37%)	05	06
4.	Ulcerations	06 (05.66%)	03	03
5.	Nodularity	04 (03.77%)	02	02
6.	Mucosal Atrophy	06 (05.66%)	04	02
7.	Rugal hyperplasia	05 (04.73%)	03	02
	Total	106 (100%)	42 (39.62%)	64 (60.38%)

As far as anatomical location of endoscopic lesions is concerned we observed, antral type gastritis in 61 (57.55%) patients, antral predominant pangastritis in 11 (10.38%) cases, corpus predominant pangastritis 06 (05.66%) and fundal gastritis in 4 cases (03.77%) and normal looking mucosa observed in 24 (22.64%) cases. as shown in table no. 3.

Table 3: Shows anatomical location of lesions in 106 cases of the gastritis on endoscopy

S.No.	Anatomical location of lesions	Number of cases	% tage
1.	Normal looking mucosa	24	22.64%
2.	Antral type gastritis	61	57.55 %
3.	Antral predominant pangastritis	11	10.38%
4.	Corpus predominant pangastritis	06	05.66 %
5.	Fundal gastritis	04	03.77%
	Total	106	100%

Histopathological findings:

Histologically we observed mononuclear inflammatory cellular infiltrates in 100 (94.34%) cases, out of total 106 patients of chronic gastritis included in this study, while 6 (5.66%) cases did not show any infiltrate. Histologically gastritis was detected in 100 cases and as far as the intensity of the infiltrates is concerned we observed - Grade 0 gastritis - Absent inflammation in 6 cases (6.00%), Grade 1 gastritis -Mild inflammation in 66 (66%) cases, (Fig 1), Grade 2 gastritis - Moderate inflammation in 17 (17%) patients (Fig 2), and Grade 3 gastritis -Severe inflammation in 11 (11%) patients (Fig 3). So histologically gastritis was detected in 100 cases out of total 106 patients.

Apart from this, we observed, lymphoid follicles with germinal centre formation in 8 cases, active inflammation with neutrophil infiltration in 12 cases, mucosal glandular atrophy in 9 cases, intestinal metaplasia in 3 and dyplasia in 2 cases respectively., and gastric adenocarcinoma was found in 2 cases.

On Giemsa stain, *H. pylori* colonization seen in 96 (96.00%) cases, (Fig 4) out of 100 cases of histopathologically proven gastritis while 4 (4%) cases were negative for *H. pylori* . Hence 96% cases of chronic gastritis are positive for *H. pylori* .Out of 96 cases infected with *H. pylori,* gastric adenocarcinoma was found in 2 cases. So out of 100 cases which showed gastritis on histopathology, 96 were positive for *H. pylori* . Prevalence rate of *H. pylori* was observed to be 96% in chronic gastritis cases. Table 4 shows histological findings in total 106 cases out of which 100 cases detected to have gastritis.

Table 4: Histological findings in total 106 cases out of which 100 cases detected to have gastritis

Histological findings in 106 cases				
S.No.	Histological hallmark of gastritis	No. of cases	Histological hallmark of gastritis	No. of cases
1.	Mononuclear cell infiltrate	100 (94.34%)	No mononuclear cell infiltrate	06 (5.66%)
2.	Presence of ***H. pylori***	96 (90.57%)	Absence of ***H. pylori***	10 (9.43%)
100 cases of gastritis showing various grades of inflammation				

S.No.	Histological findings	Grades of gastritis	No. of cases	Percentage (%)
1.	Absent inflammation	G0	06	06%
2.	Mild inflammation	G1	66	66%
3.	Moderate inflammation	G2	17	17%
4.	Severe inflammation	G3	11	11%
	Total		100	100%

Regarding comparative study of endoscopy and histopathology,we observed endoscopic gastritis in 82 cases (77.36%) while on histopathology gastric mucosal inflammation of different grades were observed in 100 cases (94.34%), 24 (22.64%) cases were observed to have normal looking mucosa on endoscopy while on histology only 6 cases (5.66%) were labelled normal i.e. without mononuclear cell infiltrate. This indicates that there is no significant correlation between endoscopic and histopathological findings as on histopathology 18 more cases were detected to have gastric inflammation who were labelled normal on endoscopy. On histopathology, we detected ***H.pylori*** in 96 cases out of 100 cases of gastritis, this indicates that 96 % cases of chronic gastritis are affected by ***H. pylori***. Table 5 shows comparative study of endoscopy and histopathology.

Table 5:shows comparative study of endoscopy and histopathology.

Total No. of cases	Endoscopy		Histopathology		
106	Findings indicative gastritis	No. of cases	Findings indicative gastritis		No. of cases
	Rugal hyperplasia	82 (77.36%)	G0- Absent inflammation		100 (94.34%)
	Erythemia/hyperemia		G1- Mild inflammation		
	Erosions		G2 – Moderate inflammation		
	Ulcerations		G3- Severe inflammation		
	Nodularity		No mononuclear cell infiltrate		06 (5.66%)
	Mucosal Atrophy		***H. pylori***		96(90.57%)
	Normal looking mucosa	24 (22.64%)	Other findings	(i)lymphoid follicles with germinal centre formation (ii)active inflammation with neutrophil infiltration (iii)mucosal glandular atrophy (iv)intestinal metaplasia (v)dyplasia (vi) Adeno Ca. 2	

Discussion:

In this study, on histopathology mononuclear cellular infiltrates detected in most of the gastric biopsies (100/106) (94.34%) and different grades of gastritis are observed, and 6 (5.66%) cases did not show any infiltrate while grade 1- gastritis was detected in 66/100 (66%) cases and grade 0- gastritis in 6/100 (6%) patients. On endoscopy 24/106 cases (22.64%) were normal while 18 cases out of them showed chronic inflammation on histopathology. Our results are parallel with that of Garg et al, (2012)[25] as well as Khan et. al (1999)[26] who found mononuclear infiltrate in majority (70%) of the cases and normal endoscopy in 32% cases respectively, so emphasising the role of biopsy in normal endoscopic cases.

We observed a significant correlation between endoscopical findings and anatomical location of gastritis and majority of the patients (61/106) (57.55%) showed hyperaemia in antral location, and on histology most of the cases showed inflammations in antral biopsies, antral predominant pangastritis in 11 (10.38%) cases, corpus predominant pangastritis 06 (05.66%) and fundal gastritis in 4 cases (03.77%) and normal looking mucosa observed in 24 (22.64%) cases, as shown in table no. 3. These findings are in agreement with Matsushia et al (2007)[29] who reported antral gastritis represented a higher percentage of endoscopic gastritis.

Histologically we observed mononuclear inflammatory cellular infiltrates in 100 (94.34%) cases, out of total 106 patients of chronic gastritis included in this study, while 6 (5.66%) cases did not show any infiltrate. As far as the intensity of these infiltrates is concerned we observed - Grade 0 gastritis - absent inflammation in 6 cases (6.00%), Grade 1 gastritis -Mild inflammation in 66 (66%) cases, Grade 2 gastritis - Moderate inflammation in 17 (17%) patients and Grade 3 gastritis -Severe inflammation in 11 (11%) patients. Apart from this, we observed, lymphoid follicles with germinal centre formation in 8 cases, active inflammation with neutrophil infiltration in 12 cases, mucosal glandular atrophy in 9 cases, intestinal metaplasia in 3 and dyplasia in 2 cases respectively, 2 cases also diagnosed to have gastric adenocarcinoma, these two cases were also positive for ***H. pylori.***

We found a considerably good correlation between ***H. pylori*** colonization and mucosal hyperaemia, gastric atrophy, and erosions. ***H. pylori*** colonization seen in 96 (96.00%) cases out of 100 cases of histopathologically proven gastritis while 4 (4%) cases were negative for *H. pylori* . All grades of gastritis (G1,G2,G3) showed ***H. pylori*** colonization while G0 was negative, and 2 cases positive for ***H. pylori*** colonization were positive for adenocarcinoma. On endoscopical findings in this study, we reported hyperaemia in most of the cases having chronic gastritis, and our findings are in agreement with a study by Garg et. al (2012)[25], Calabrese et, al (1999)[27] and Yasim et al[28], who reported hyperaemia in maximum number of patients with chronic gastritis.

In our study the sensitivity of endoscopic abnormalities for chronic gastritis has been determined to be 77.36%, and that of histopathology found to be 94.34% and ***H. pylori*** colonization was detected in 90.57% of cases. We observed grade 1 gastritis (G1) in 66%, grade 2 gastritis (G2) in 17%, and grade 3 (G3) 11% and all of them positive for ***H. pylori*** colonization , this is in agreement with a study of Rugge et al.,2007[30] who found G1 gastritis in 68%, G2 in 14 % and G3 in 12% of cases with chronic gastritis. We observed, active inflammation with neutrophil infiltration in 12 cases, mucosal glandular atrophy in 9 cases, intestinal metaplasia in 3 and dyplasia in 2 cases respectively, these findings are more or less in agreement with Garg et. Al 2012[25]. We detected ***H. pylori*** colonization in 90.57% of cases which is near to study done done by Kumar et al. (2006)[31] who reported positivity in 78%.

We found 2 cases of gastric adenocarcinoma in this study as chronic inflammation play an important role in development of various cancers, including H. pylori associated gastric cancer, Uemura et al., 2001[19]. Gastric carcinoma is an important cause of cancer related

death, so understanding the pathogenesis of ***H. pylori*** induced gastric carcinoma may improve the risk stratification for prevention and therapy. This is the only cancer which can be prevented by antibiotics by eradication of ***H. pylori.***

Conclusion:

H. pylori is an important cause of chronic gastritis and associated with 4-8 folds increase in the risk of developing carcinoma and there is a close relation between the ***H. pylori*** infection and gastric MALT lymphoma. So every case of chronic gastritis should be given therapy for the eradication of ***H. pylori,*** as it is not possible to have the facilities for endoscopy and biopsy at every centre in most of the developing countries.

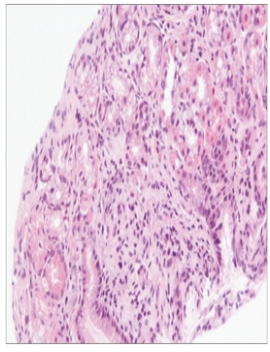

Fig - 1 : Shows Grade 1 gastitis- mild mononuclear cellular infiltration

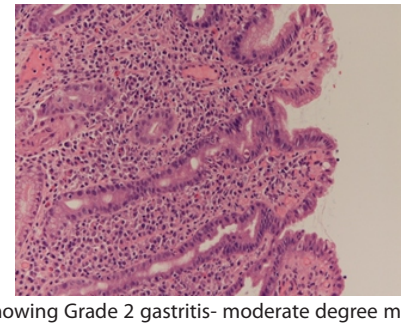

Fig- 2 : Showing Grade 2 gastritis- moderate degree mononuclear cellular infiltrate

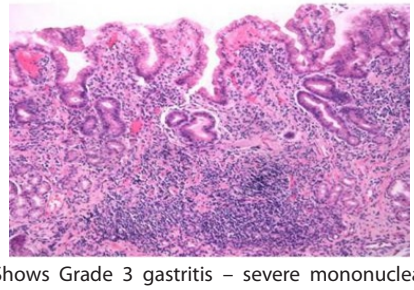

Fig -3 : Shows Grade 3 gastritis – severe mononuclear cellular infiltration

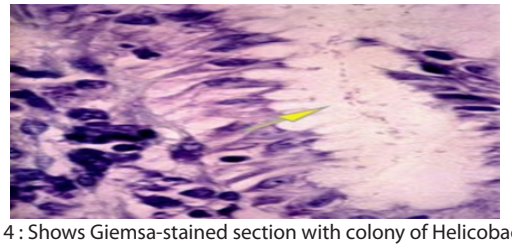

Fig - 4 : Shows Giemsa-stained section with colony of Helicobacter pylori

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