

# H.Pylori Associated Gastritis

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## ABSTRACT

**Introduction:** *H.Pylori* has been associated with various upper gastro-intestinal tract disorders including gastritis, peptic ulcer and gastric malignancies. There is a paucity of literature regarding the study of morphological changes in *H.Pylori* associated gastritis, as *H.Pylori* colonized gastric mucosa is a distinct pathologic entity with a pathologic spectrum ranging from active chronic gastritis to erosions & frank ulcer.

**Objective:** The aim of this study was to know the morphological changes seen in gastric mucosa associated with *H.Pylori*. And also to find out prevalence of *H.Pylori* in patients undergoing upper gastro-intestinal endoscopic biopsies with gastritis in the centre.

**Materials and Methods:** A total of 100 patients who were clinically diagnosed as having acute or chronic gastritis were included for this study during the period December 1999 to December 2001. A detailed clinical history was taken as per the standard proforma. Then the patients were subjected for endoscopy. Five endoscopic biopsies were taken and processed for rapid urease test and histopathological examination.

**Results:** Out of 100 cases of endoscopically diagnosed gastritis, 48 cases were *H.Pylori* positive. In this 48 *H.Pylori* positive cases, 43 were positive by both rapid urease test (RUT) and histopathology. 3 cases were RUT positive but negative for *H.Pylori* by histopathology, and 5 cases were negative by RUT but histopathology showed presence of *H.Pylori*. Morphological changes specific for *H.Pylori* colonization and characteristic features are irregular surface epithelium, loss of apical mucin, cell dropout, formation of pits and microerosions. Out of 100 cases, 46 were RUT positive and 54 cases RUT negative. 48 were histology positive and 52 were histology negative. Statistically, no significant difference between urease test and histopathological demonstration of *H.Pylori* ( $p>0.05$ ).

**Conclusions:** Prevalence of *H.Pylori* in the present study was 48% in patients undergoing upper gastro-intestinal endoscopic biopsies with gastritis in this centre. *H.Pylori* infection is associated with spectrum of histological changes in gastric mucosa, which in turn facilitates the identification of *H.Pylori*. RUT and histopathology are the 2 diagnostic methods which can be used with an equal importance for the detection of *H.Pylori* associated lesions.

**Key Words:** H. Pylori associated gastritis, Endoscopic biopsies, RUT, Giemsa staining, Histopathological features

## INTRODUCTION

The study of gastric bacteriology remained neglected for a long period. It has gained importance since the isolation of *H.Pylori* from gastric biopsies in 1983. *H.Pylori* has been associated with various upper gastro-intestinal tract disorders [1] including gastritis, peptic ulcer and gastric malignancies. There is a paucity of literature regarding the study of morphological changes in *H.Pylori* associated gastritis, as *H.Pylori* colonized gastric mucosa is a distinct pathologic entity with a pathologic spectrum ranging from active chronic gastritis to erosions & frank ulcer. Thus the present study was undertaken to document the prevalence, morphological changes associated with *H.Pylori* colonization in gastric mucosa.

## MATERIALS & METHODS

A total of 100 patients who were clinically diagnosed as having acute or chronic gastritis were included for this study during the period December 1999 to December 2001 in BLDEA's Shri B M Patil Medical college, Bijapur, India. Patient with H/O. tobacco chewing, alcohol intake and non-steroidal anti-inflammatory drug intake were excluded from this study.

Five endoscopic biopsies [2,3] were taken from per patient for the study:

- One for rapid urease from antrum along the greater curvature.
- Two for histopathology from antrum and posterior wall of antrum
- Other two for histopathology from anterior and posterior wall of mid-body [Table/Fig-1].

### For Rapid Urease Test-

Biopsy specimen taken from the antrum were placed immediately in eppendorf tube containing 0.5 ml urease test reagent [4] and sealed with cap. Then the tubes were kept in incubator at 37°C, development of red color (from yellow) were considered as positive test indicating the presence of *H.Pylori* [Table/Fig-1].

Then the other 4 biopsies were processed for paraffin embedding, sections on the first slide were stained with routine Harri's Haematoxyllin & Eosin stain [5]. The histopathological evaluation of stained section (first slide) were studied for *H.Pylori* associated gastritis [6,7] [Table/Fig-2,3,4,5,6]. The second slide was stained using the Giemsa technique for the demonstration of *H.Pylori* [3] [Table/Fig-7,8,9].

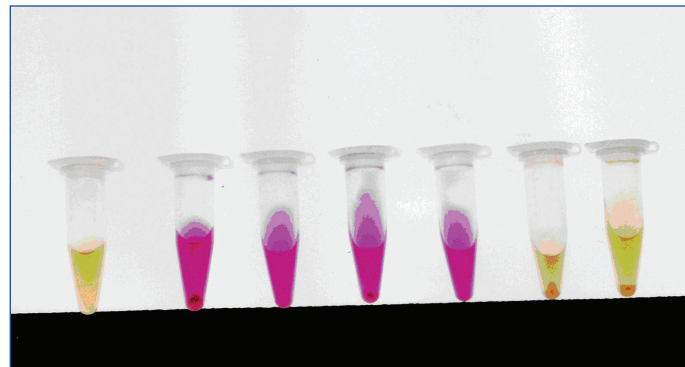
## RESULTS

In the present study a total of 100 patient presenting with symptoms of heart burn, epigastric discomfort, pain abdomen & vomiting

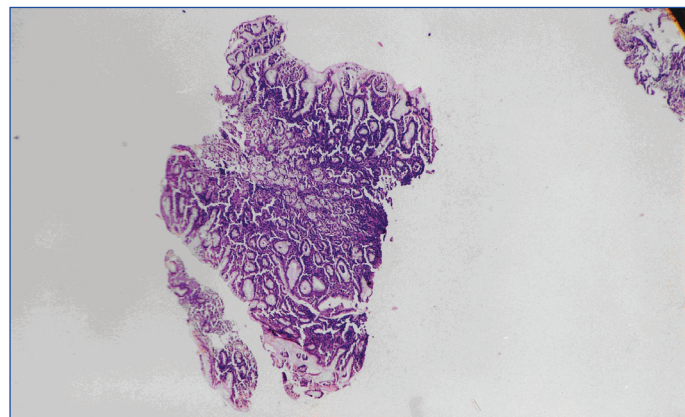
were subjected for endoscopy. On endoscopic examination signs of gastritis were observed. These cases were selected for further study. For each case rapid urease test was done in the operation theater itself. Taking histopathology as a final diagnosis morphological changes due to *H.Pylori* associated gastritis were studied in 100 cases & following results were obtained.

In total of 100 cases of chronic gastritis, common age of incidence was between 21-30 years with a male predominance. 48 were *H.Pylori* positive and 52 were *H.Pylori* negative by histopathology. Out of 48 *H.Pylori* positive cases, 43 were positive by both RUT & histopathology. But 3 were RUT positive & negative for *H.Pylori* by histopathology and 5 were negative by RUT but histopathology showed presence of *H.Pylori* [Table/Fig-10].

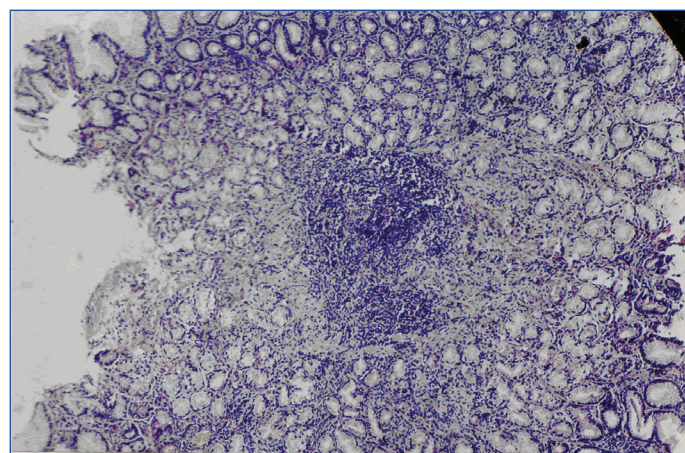
Thus specificity and sensitivity of Rapid urease test is Specificity – 94.23 %, Sensitivity – 89.58%. Morphological changes due to *H.Pylori* associated gastritis was noted as mentioned by Hui Pak



**[Table/Fig-1]:** Urease Test - 1st tube - control (yellow), 2nd, 3rd, 4th tubes - positive tests (pink), 6th, 7th tube - negative test (yellow)



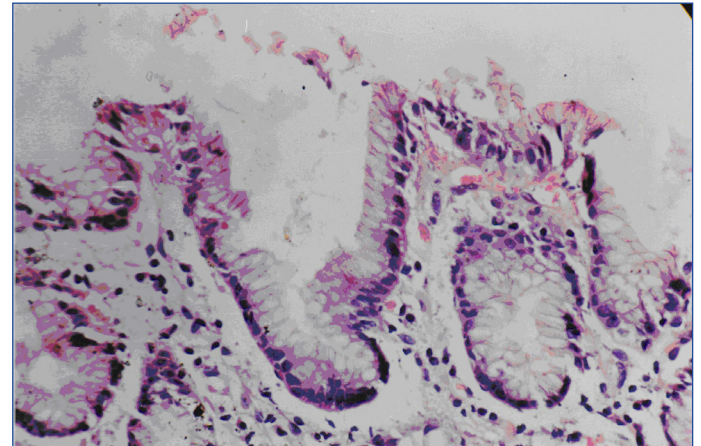
**[Table/Fig-2]:** Gastric mucosal biopsy (H&E, 40x)



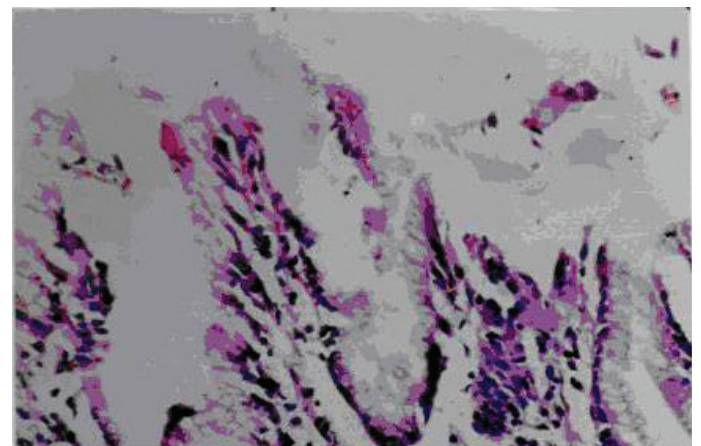
**[Table/Fig-3]:** Gastric biopsy showing lymphoid aggregates (H&E, 100x)

et. al [8] Among all irregular epithelial surface, loss of apical mucin are the two common features noted in all 48 cases of *H.Pylori* positive cases. In the normal gastric mucosa the epithelial surface is regular. Apical border in all the glands is smooth. In case of *H.Pylori* associated gastritis, the epithelial surface became irregular and uneven. Along with the loss of apical mucin characterized by nipping of apical bud with 100% cases.

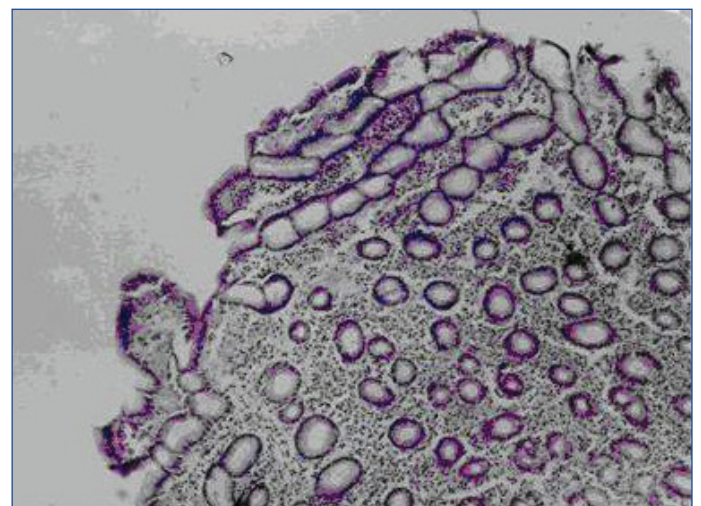
77% were showing epithelial cell drop out which was characterized by pyknotic nuclei 58% were showing pit formation due to loss of apical mucin & cell drop out. These pits were deep at some places occupying crypts as well. 35% were showing micro erosions



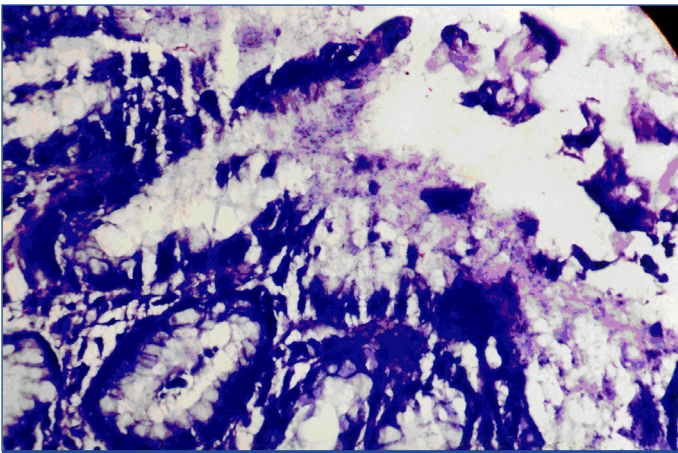
**[Table/Fig-4]:** Gastric biopsy showing irregular epithelial surface with formation of pits (H&E, 400x)



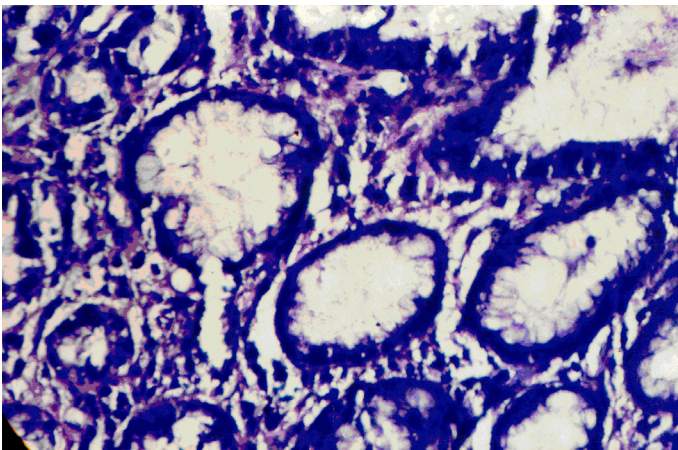
**[Table/Fig-5]:** Gastric biopsy showing cell drop out (H&E, 400x)



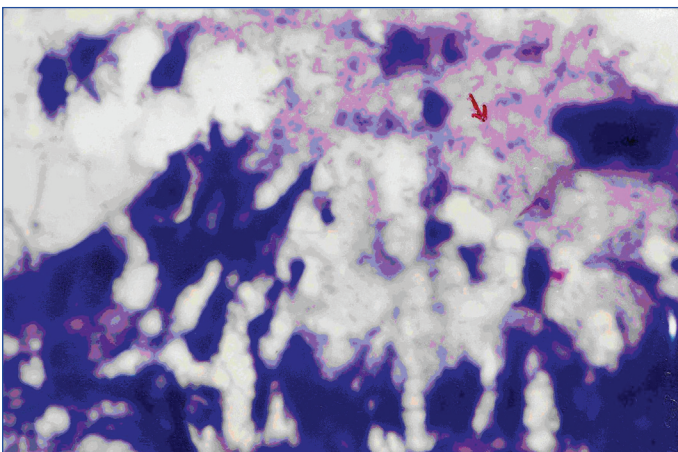
**[Table/Fig-6]:** Gastric biopsy showing extravasated RBC's & PMNs polymorphonuclear cells in lamina propria (H&E, 200x)



[Table/Fig-7]: Gastric biopsy showing clusters of H.pylori over the epithelial surface (Giemsa, 200x)



[Table/Fig-8]: Gastric biopsy showing H.pylori in glandular lumen (Giemsa, 200x)



[Table/Fig-9]: Gastric mucosal biopsy showing H.pylori (Giemsa, 1000x)

No. of cases	H.Pylori	
	RUT	Histopathology
43	+ ve	+ ve
03	+ ve	- ve
05	- ve	+ ve

[Table/Fig-10]: Comparative results of Helicobacter pylori by Rapid Urease test (RUT) & histopathology.

Sl.No	Morphological changes	No. of cases	%
1	Irregular surface	48	100
2	Loss of apical mucin	48	100
3	Cell drop out	37	77
4	Formation of pits	28	58
5	Microerosions	17	35

[Table/Fig-11]: Morphological changes due to H.Pylori associated gastritis was noted as mentioned by Hui Pak et. al 3%

Tests	No of cases for H.Pylori	
	Positive	Negative
RUT	46	54
Histopathology	48	52

[Table/Fig-12]: Comparison between the two diagnostic methods (RUT & histopathology). Out of 100 cases

focused mainly on the inflammatory reaction of gastric mucosa colonized by *H.Pylori*. There were paucity of literature regarding the epithelial changes in gastritis till 1992.

Hui Pak et. al expanded this concept by studying the pathological changes of gastric mucosa colonized by *H.Pylori* on H & E stained tissue sections. They found out that the identifying *H.Pylori* was associated with epithelial degenerative changes greatly influence the identification of *H.Pylori* in gastric biopsies. The present study was designed to know the prevalence of *H.Pylori* associated gastritis in patients undergoing upper gastro-intestinal endoscopy in center who were clinically diagnosed as gastritis. Also to study the morphological changes in gastric mucosa associated with *H.Pylori* gastritis [11,12].

A total of 100 cases of clinically diagnosed gastritis were included for this study. It is noted that Male patients with chronic gastritis were out numbered from female patients. The M:F ratio is 3:1. These results concure with the findings of Yoosuf H et al [13]. Another author Taylor et.al reported prevalence rate of 43% in his study. In the present study prevalence of *H.Pylori* was 48% in patients attended upper gastro-intestinal endoscopy units with gastritis. In a study of Singal A I quoted prevalence with a wide range of 31-84% [14].

The Sensitivity of RUT for diagnosis of *H.Pylori* infection is 89.58% and specificity of 94.23% respectively. These results correlates with Yoosuf et al. who got sensitivity of 89.83% & specificity of 100%. The only variation is towards specificity results in present study which could be due to patchy distribution of organism. In all 48 positive *H.Pylori* associated gastritis majority of epithelial degenerative changes included irregular surface epithelium & loss of apical mucin (100%). The least number of cases obtained were showing microerosion (35%) and second commonest finding of morphologic changes included cell drop out (77%) followed by formation of pits (58 %). These findings correlated with the study of Pak Hui et al [8]. The only point is of micro erosions where we got less number of cases obtained in the present study compared with that of Pak Hui et al. study. This possibly could be due to picking of

characterized by congested sub-epithelial layer, extravasated rbc's, dense mixed inflammatory infiltrate composed of polymorphs and lymphocytes [Table/Fig-11]. When RUT and histopathology were compared, out of 100 cases, 46cases were RUT positive & 54cases were RUT negative. Along with 48 cases were histology positive & 52 cases were histology negative. Statistically, no significant difference between urease test and histopathological demonstration of *H.Pylori* (P>0.05) [Table/Fig-12] [Table/Fig-4,5,6].

## DISCUSSION

In 1983, Warren & Marshall described the strong association between *H.Pylori* and chronic gastritis [9,10]. Previous studies had

cases more in early stages.

In the present study  $P > 0.05$  which was not significant indicating that there was no difference in diagnosing *H. Pylori* associated gastritis by RUT & histopathology. It signifies that these two diagnostic methods play as an equal role in detection of *H. Pylori*. For these observations, data for further study is needed.

## CONCLUSION

It is obvious that epithelial lesions described in our study are specific for *H. Pylori* colonization and are highly characteristic, easy to recognize. They were absent in *H. Pylori* negative gastric biopsies. Thus identifying *H. Pylori* associated epithelial changes can greatly facilitate the identification of *H. Pylori* in gastric biopsies. It is also obvious that the two diagnostic methods RUT & histopathology play an equal role in detection of *H. Pylori*. This needs further study to know the importance of these diagnostic methods for better detection of *H. Pylori* associated lesions.

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