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Original Article

Histopathological Analysis of Gastric Biopsies using Updated Sydney System

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ABSTRACT

Objective: To analyse histopathological findings in gastric biopsies of patients with dyspepsia using an updated Sydney System.

Study Design: Retrospective longitudinal study.

Place and Duration of Study: Histopathology Department, Najran Armed Forces Hospital (NAFH), Saudi Arabia, from Jan 2013 to Mar 2020.

Methodology: A total of 408 cases whose gastric biopsies were included in the study, and their histological features were studied.

Results: Among 408 patients included in the study, 191(46.8%) were males, and 217(53.2%) were females. The mean age was 37.0±15.0 years. A total of 343 patients showed gastritis, which was mild 152(44.3%), moderate 158(46.1%) and severe 33 (9.6%), respectively. The activity was observed in 200(49.0%) patients. *H.pylori* infection was observed in 196(48.0%) patients and intestinal metaplasia in 9(2.2%) patients.

Conclusion: Most of the cases with dyspepsia showed histological evidence of gastritis. However, a significant number of patients had no gastric mucosal abnormality. Therefore, adequate and timely treatment *of H.pylori* infection can significantly reduce related morbidity.

Keywords: Gastritis, Helicobacter Pylori, Non-ulcer dyspepsia.

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INTRODUCTION

Dyspepsia is used for recurring signs and symptoms of indigestion without any obvious cause.[1] It includes a combination of symptoms such as epigastric pain, epigastric discomfort, fullness, early satiety, burning, nausea and vomiting.[2] It is also called non-ulcer dyspepsia or non-ulcer stomach pain. It is one of the most common symptoms in patients presenting in general medical and gastroenterology outpatients department.[3]

In Saudi Arabia, 15% adult population has dyspepsia, and up to 80% population of KSA experience the symptoms of dyspepsia at some time in their life.[4,5] Most of these patients do not have any organic cause. In KSA H.pylori, smoking and painkillers are important risk factors for dyspepsia.[6]

Gastritis is inflammation of gastric mucosa caused by different causes. It can be classified according to the underlying aetiology.[7] One of the most frequent causes of gastritis is H.pylori. Histological changes in chronic gastritis include infiltration of lamina propria by lymphocytes, plasma cells and other cells. Active disease may show neutrophils as well. Dense inflammation may lead to lymphoid follicles formation. In H.pylori infection, inflammation is denser in the antrum than corpus.[8] In 1994 the new Updated Sydney system was devised by the experts in Houston, Texas.[9]

The objective of this study was to evaluate histological findings in gastric biopsies of patients with non-ulcer dyspepsia using the updated Sydney classification in our material. The outcome of the study will help in better understanding and management of the patients with non-ulcer dyspepsia.

METHODOLOGY

This retrospective longitudinal study was performed at Najran Armed Forces Hospital, Saudi Arabia from January 2013 to March 2020. Permission was taken from the Hospital Ethical Review Committee. A sample size of 408 cases was calculated using the Raosoft online sample size calculator, taking 35% prevalence of H.pylori,[10] with a 95% confidence level, and the margin of error as 4.81%.

Inclusion Criteria: Patients of either gebder, having symptoms of dyspepsia, epigastric discomfort, epigastric pain and early satiety were included in the study.

Exclusion Criteria: Patients with a history of NSAID use, antibiotics and gastric acid suppressants were

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excluded from the study. Gastric biopsies of patients who already received H. pylori eradication treatment were excluded.

Gastric biopsies cases performed from January 2013 to March 2020 were retrieved from archives of the Histopathology Department. Haematoxylin and Eosin stains were used in routine histopathology, and Giemsa stains were done to demonstrate *H.pylori* and analyzed by a consultant histopathologist. The updated Sydney system was used, and histological variables like the density of *H.pylori*, mononuclear inflammatory infiltrate, neutrophils, glandular atrophy, and intestinal metaplasia were graded on a scale of 3 (mild, moderate, and severe).

The mean±SD were calculated for age, and patients were grouped according to different ages. Minor histopathological features were assessed for presence or absence but not graded. Categorical variables were presented by frequency and percentages using Microsoft excel worksheets.

RESULTS

The study comprised 408 patients who presented with gastric complaints, which included dyspepsia, epigastric discomfort and epigastric pain. Among these, 191(46.8%) were males, and 217(53.2%) were females. The age range was between 7 to 80 years. The majority of the cases were in their third and fourth decade. The mean age was 37.0±15.0 years.

A total of 343 cases showed microscopic features of chronic gastritis. On evaluating the histological features of those patients with chronic gastritis, chronic inflammation was graded as mild, moderate and severe, as depicted in Figure-1.

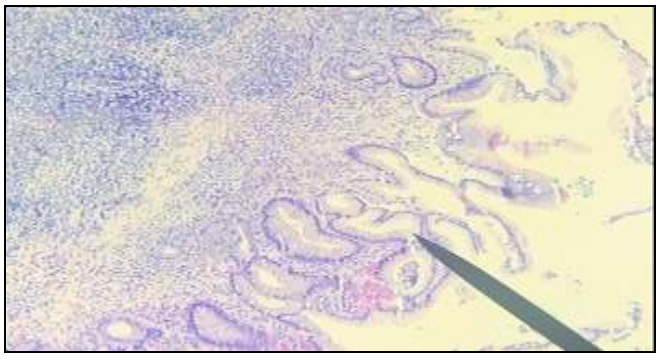

Figure-I: Showing Severe Inflammation in a Gastric Biopsy (10X)

Mild inflammation was seen in 152(44.3%) patients, Moderate inflam-mation in 158(46.1%) patients and severe inflam-mation in 33(9.6%) patients. The activity was observed in 200(49.0%) patients. Among these, 128(64%) had mild activity, 57(28.5%) had moderate, and 15(7.5%) had severe activity (Figure-2). In addition, intestinal metaplasia was observed in 9(2.2%) patients.

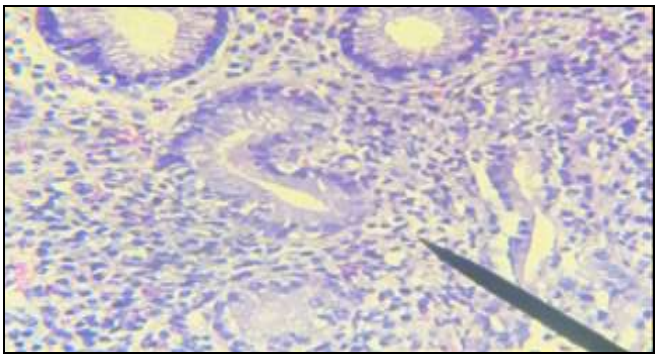

Figure-2: Showing Severe Activity and Glandular Atrophy in a Gastric Biopsy (40X)

On microscopic examination, H.pylori was observed in 196(48%) patients with non-ulcer dyspepsia. Among these patients, 79(40.3%) had mild, 99(50.5%) had moderate, and 18(9.2%) had severe colonization of H Pylori. Topographically gastritis involved antrum in 249(72.6%) cases, antrum and corpus (pan gastritis) in 71(20.7%) and corporal gastritis in 23(6.7%) cases. 65(16%) cases showed unremarkable mucosa (Table).

Table: Histological Changes Observed in Gastric Biopsies (n=408)

Histological Findings	Grade				Total Positive
	Nil	Mild	Moderate	Severe	
Inflammation	65 16.0%)	152 (44.3%)	158 (46.1%)	33 (9.6%)	343 (84.0%)
Activity	208 (51.0%)	128 (64.0%)	57 (28.5%)	15 (7.5%)	200 (49.0%)
Glandular atrophy	373 (91.4%)	29 (82.8%)	6 (17.2%)	-	35 (8.6%)
Intestinal Metaplasia	399 (97.8%)	6 66.7%)	3 (33.3%)	-	9 (2.2%)
H. pylori	212 (52.0%)	79 (40.3%)	99 (50.5%)	18 (9.2%)	196 (48.0%)

DISCUSSION

The most common gastric complaint encountered by general medical practitioners and gastroente-rologists is dyspepsia. However, its prevalence in the general population varies from 20-30%. In some European studies, North America, showed the prevalence of dyspepsia in the range of 3-40%.[11] These differences in prevalence are due to differences in the definition used for dyspepsia in these studies.[12,13]

This problem leads to excessive patient expenditure in the form of expensive drugs & investigations.

It causes a burden on the clinical setup, including health care practitioners. In our study, most of the patients with dyspepsia were in their third and fourth decade with a mean age of 37±15 years, comparable to the study done in Saudi Arabia, 32.6 years,[12] and a study done in Pakistan with a mean age of 42.5 years.[3]

Considering patients according to gender, patients were almost equal, with slightly more female patients, 217(53.2%). On histological examination, most of the patients in this study revealed features of chronic gastritis 343(84%), slightly higher than a study done by Sarfarz *et al*.[3] However, 65(16%) showed unremarkable mucosa in a significant number of cases. This finding indicates considering other reasons for dyspepsia if the histology is normal.

Chronic inflammation was observed in these patients, comparable to a study done in india,[13] which showed chronic inflammation in 82.1% of cases. Another study in Pakistan,[3] and Nigeria,[14] observed chronic inflammation in 70% and 66.5% of cases, respectively, which was lower than our study. The activity was seen in 49% of the patients, which was lower as compared to a study done by Toukan *et al.* which showed 65% of patients with activity.[15]

Glandular atrophy was present in 8.6% of patients in our study, mild to moderate. It was comparable to a similar study in India, which had glandular atrophy in 9.8% of cases.[16] Some other studies by Sarfaraz *et al*. and Arruda *et al.* showed 2% and 2.5 % incidence, which was lower than ours.[3,17] Intestinal metaplasia was observed in only 2.2% of the patients, which is comparable to other studies as well.[17,18]

H.pylori infection was observed in 48% of the patients with dyspepsia. This was comparable to a study done by Singh *et al.*[16] which showed that 48% of patients with H.pylori infection also. However, two other studies by Sultana *et al.*18 and Tani *et al.*[19] showed a higher number of patients with H.pylori-associated gastritis. These differences may be because of antibiotics and better living standards. However, the prevalence of H.pylori varies considerably in different studies ranging from 37.5 to 75%. In our study, gastritis involved antrum in 72.6% of cases, followed by pangastritis, which is in correlation with other studies as well.[20,21]

CONCLUSION

This study confirmed the correlation of H.pylori with different histopathological changes, greater density associated with greater inflammatory infiltrate. Although various non-invasive procedures are, available for the detection of H.pylori, gastric biopsy remains the gold standard as it provides the degree of infection and complete details of all histological parameters. Many patients showed no histological changes, which imply investigating other causes of dyspepsia.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

MZ & NKA: Data acquisition, data analysis, drafting the manuscript, critical review, approval of the final version to be published.

MAN & HT: Conception, drafting the manuscript, approval of the final version to be published.

AAB & NA: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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