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Frequency distribution, Histopathology of *H. pylori* among dyspeptic patients from Peshawar and associated risk factors analysis

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H. pylori are the highly alarming and most frequently gastrointestinal-associated Gram-negative rod-bacteria that cannot be easily eliminated from the body. *H. pylori* has always been known as related to acute or chronic gastritis, stomach, cancer, duodenal and peptic ulcers and lymphoma. Same to all under developed and developing countries, there is also high *H. pylori* prevalence in Pakistan. The prevalence of *H. Pylori* identified within a range of 50–90%. Various testing strategies and populations can be used because of this huge variation in prevalence. 135 chronic dyspeptic patients went for endoscopy procedures. From each patient two biopsies were collected (from the body and antrum of the stomach). The collected biopsies were quickly and aseptically transported to the department of pathology for histological examination for *H. Pylori* infection. Histological stains Hematoxylin & eosin along with Giemsa stain were performed for the identification. Histopathological examination revealed 116 (85.9%) out of 135; 71 mild, 20 moderate and 25 in severe condition. While in 83 (61%) patients atrophic changes were observed; 55 mild, 22 moderate and 6 patients in severe condition. Intestinal metaplasia was observed in 12 (8.8%) patients; including 8 mild and 4 moderate patients. In 70% patients' gastric atrophies were also observed therefore the severe atrophic changes could be 22%. It is concluded that Gastritis is the major gastrointestinal problem in patients having dyspeptic disease. Moreover the low prevalence of *H.pylori* in aspect to severe atrophy and intestinal metaplasia suggests low risk of gastric mucosal cancer.

Keywords: *H.pylori*; Histopathology; dyspeptic patients; intestinal metaplasia; endoscopy; Prevalence; Gastritis

INTRODUCTION

H. pylori is the highly alarming and most frequently gastrointestinal-associated Gram-negative rod-bacteria that cannot be easily eliminated from the body. The link of Gastric disorders and the discovery of H. pylori has questioned the field of medical care. Peptic ulcer is no more appraise to be a persistent recurring condition, but is now curable by triple antibiotic treatment as an infectious disease. *H. pylori* has

always been known as related to acute or chronic gastritis, stomach, cancer, duodenal and peptic ulcers and lymphoma (Nizami et al. 2005). Same to all under developed and developing countries, there is also high *H. pylori* prevalence in Pakistan (Kusters et al. 2006). The prevalence of *H. Pylori* identified within a range of 50–90% (3–7) (Hassan et al. 2007). Various testing strategies and populations can be used because of this huge variation in prevalence. *H. pylori* Invasive or non-invasive approaches may be used to tr eat infection. Endoscopy and biopsy tissue sampling that is available for histological examination, tissue culture or direct molecular analyses are needed in invasive processes. While non-invasive approaches are serological and molecular detection and Urea Breath Test. The most widely used intrusive *H. pylori* form is histological exams for Clinical pylori identification. The most commonly used for *H. pylori* detection are hematoxyline and eosins, Giemsa and silver stains. Pylori found gastric mucosa specimens in the tissue parts. (Atherton et al. 2009) Although the prevalence of H is very high. Infection with pylori, weak background data and applied *H. Pylori* prevalence is known from Pakistan and their association with different clinical presentations. Typically in Pakistan the genetic diversity of *H.pylori* is little lower than the developed countries, the limited health care facilities in Pakistan emphasize on more work to be done on various aspect of *H. Pylori*(Abbas et al.1988*)*.There is limited data on morphological changes of H. pylori in gastric environment (Ahmad et al.2009). We aim at recording the prevalence of *H.pylori* in this study. In dyspeptic Peshawar patients, pyloric and related morphological changes are associated to gastric mucosa, such as gastritis, atrophy and intestinal metaplasia (Mehmood et al. 2011).

MATERIALS AND METHODS

This study was carried out in Gastroenterology ward of Hayatabdad, Medical Complex, Peshawar, Pakistan. The time duration was (Sep, 2018 to June, 2019). The conducted work was also approved by institutional review board (IRB) at HMC, Peshwar, Pakistan.

Sample Collection

A total of 456 dyspeptic patients were enrolled in the study on the basis of qualification of Rome-III criteria. 130 patients were excluded due to existing peptic ulcer, HCV or HBV and gallstones. The remaining 305 patients were asked to sign inform consent before recommended endoscopic investigation with histopathology (Rotimi et al. 200). 135 chronic dyspeptic patients went for endoscopy procedures by using Olympus CV-160, and GIF-160 system (Olympus, Japan). From each patient two biopsies were collected (from the body and antrum of the stomach) (Mehmood et al. 2014).

Sample processing

The collected biopsies were quickly and aseptically transported to the department of pathology for histological examination for *H. Pylori* infection. Histological stains Hematoxylin & eosin along with Giemsa stain were performed for the identification.

Classification and Grading

The confirmation of *H. pylori* in the collected samples were graded absent or present while classification of severity of gastritis was recorded according to Sydney system and documented such as, nill or absence, mild form, moderate and severe form of infection (PRICE 1991).

In lamina propria the presence of rod-shaped bodies and mononuclear inflammatory cells indicates gastritis. During microscopic examination numerous numbers of neutrophils was detected during microscopic examination shows positive result and it also showed the Atrophic changes (loss of gastric glandular cells due to damaged gastric lining) and intestinal metaplasia.

RESULTS

The collected antral biopsies were examined for the *H pylori* causing gastritis and side wise any inflammatory damage, intestinal metaplasia and atrophic changes in the dyspeptic patients. A total of 135 dyspeptic patients were screened for *H.pylori*. Gender frequency is 93 (68.8%) males while 33 (31.8%) were female out of the total number. The body mass index and age were 45±6.3 for males and 26.2±1.8 for females respectively. Rod shaped bacteria were observed in tissue samples it indicates *H.pylori* positive (Figure 1).

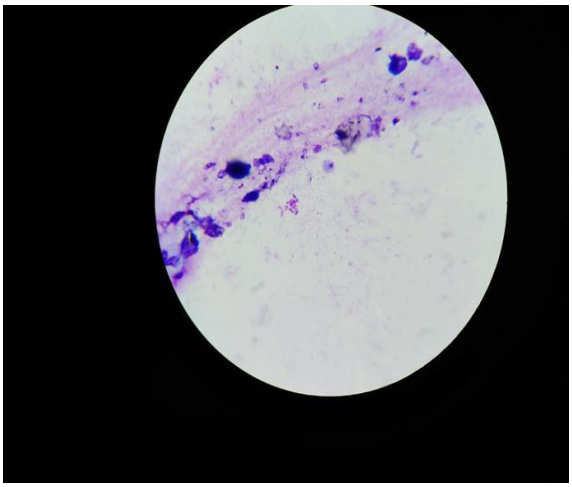

Figure 1: H&E stain for identification of *H. pylori*

88.3 % prevalence was observed of *H.pylori* in these dyspeptic patients. According to Sydney system grading of inflammation were documented ranges from mild to severe. Histopathological examination revealed 116 (85.9%) out of 135; 71 mild, 20 moderate and 25 in severe condition.While in 83 (61%) patients atrophic changes were observed; 55 mild, 22 moderate and 6 patients in severe condition. Intestinal metaplasia was observed in 12 (8.8%) patients; including 8 mild and 4 moderate patients shown in Table 1. In 70% patients' gastric atrophies were also observed therefore the severe atrophic changes could be 22%.

Table1: Histopathological findings and grading of gastric biopsy tissue samples (n=135)

Findings	Mild Condition	Moderate Condition	Severe Condition	Total (%)
Gastritis	71	20	25	116 (85.9)
Atrophy	55	22	6	83 (61)
Metaplasia	8	4	0	12 (8.8)

DISCUSSION

H. pylori is classified as class-1 human carcinogen by world health organization. *H.pylori* is responsible for causing peptic ulcer, duodenal ulcer and gastritis (Bavithra, V. 2019). Sometimes followed by atrophy, dysplasia and intestinal metaplasia and can lead to gastric mucosal carcinoma. gastric atrophy and intestinal metaplasia were reported in positive *H.pylori* cases (Uemura et al 2001). The 85.3 % prevalence of *H.pylori* is almost seems in correspondence to the previous reported prevalence in the same region which is 84.6% (Kuipers et al 1998). The little differences in number could be due to different methodologies. The most used and commonly employed method for *H.pylori* investigation is histological examination. H&E, Silver and Giemsa stain has also been proposed for detection of *H.pylori* (Mégraud, F. 1997). Adequate number of biopsies, biopsy site and skill of the pathologist are greatly considered for the accuracy of *H.pylori* detection. Histological techniques are more advantageous for are detection of *H. pylori because its also gives information about* its colonization density, morphological changes in the gastric mucosa demonstrating and conditions like atrophy, intestinal metaplasia, dyspepsia or malignancies (Galbán et al. 2012). Our findings in agreement with the previous reported study in which gastritis were detected in more than 90% of infected H. pylori patients (Ekesbo et al. 2006). 8.8% patients having intestinal metaplasia is an interesting finding. *H.pylori* is now been considered for the intestinal metaplasia and atrophy which may lead to gastric cancer. Intestinal metaplasia was being reported in Chinese population along with higher inflammatory changes (Zhang et al 2005). In several cases the genetic variation and origin of H. *pylori* are considered the major factors for determining disease outcome. Patient infected from the virulent cytotoxin-associated gene A (CagA) appear with most complications and severity as compared to the patients infected with cag A negative virulent *H. pylori*.(Parsonnet, et al. 1997) CagA gene has been isolated in more than 70% in North America and European Communities (Atherton et al. 2009) However in some studies it has showed that Pakistan region have almost less than 24% of the Cag A positive strains of *H. pylori* documented (Ahmad et al, 2009). The virulent *H.pylori* strains may be attributing for causing mild gastric atrophy and lower prevalence of intestinal metaplasia in Pakistani population, However more research work is needed to design which focused on such findings in Pakistan (Tummuru et al.1993).

CONCLUSION

It is concluded from the study that high alarming prevalence of helicobacter pylori in residents of Pakistan is increasing day by day if not properly diagnosed and treated. Gastritis is the major gastrointestinal problem in patients

having dyspeptic disease. Moreover the low prevalence of *H.pylori* in aspect to severe atrophy and intestinal metaplasia suggests low risk of gastric mucosal cancer.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

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AUTHOR CONTRIBUTIONS

Conceptualization, S.F.SA.S and M.T.A; methodology, S.K.MR.; software, S.S; validation, Z.A., Z.H; formal analysis, M.N.U and HS; writing—original draft preparation, SAS and S.F; writing—review and editing, R.U and S.H.A.; supervision, S.A.S., S.S.

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