



ASSOCIATION OF HELICOBACTER PYLORI WITH DIFFERENTIATION OF GASTRIC ADENOCARCINOMAS – EXPERIENCE FROM A TERTIARY CARE CENTRE IN TAMILNADU, INDIA

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ABSTRACT

Background: Gastric carcinoma constitutes a leading cause of cancer related mortality. **Aim:** To study the association of Helicobacter pylori infection with the demographic parameters, site of occurrence and the grade of differentiation in gastric adenocarcinomas. **Material and Methods:** This is a retrospective study conducted in a tertiary care centre for a period of 3 years from 2012-2015. Random sampling of 50 consecutive gastrectomy specimens was done and tested for the presence of Helicobacter pylori infection. **Results:** Out of 50 cases of adenocarcinoma stomach, 39[78%] were males and 11[22%] were females. Among 39 male patients, 18 were H.pylori positive and out of 11 females, 7 were H.pylori positive. The prevalence of H.pylori was predominantly in the age group between 41-50 years. Regarding the site of occurrence, 41 cases were located in the antropyloric region and 9 at body fundus region. Out of 25 H.pylori infected cases, 20 were low grade and 5 were high grade adenocarcinomas. **Conclusion:** Helicobacter pylori is associated more often with low grade gastric adenocarcinoma. All asymptomatic high risk individuals should be tested for H.pylori infection and H.pylori positive patients should be treated prophylactically.

KEYWORDS : Helicobacter pylori, Gastric adenocarcinoma, grade of differentiation.

Introduction

Gastric carcinoma is estimated to be the one of the most common five cancers in Indian population with marked variation from place to place¹. Globally it is the third leading cause of cancer related morbidity constituting 9.7% of all cancer related mortality². The etiology of gastric carcinoma appears multifactorial. A complex interaction between the environmental factors, pathogens and the host factors constitute the development of gastric cancer³. World health organisation has declared H.pylori as a definite carcinogen for gastric carcinoma in 1994⁴. Infection with H.pylori is very common throughout the world, occurring in 40-50% of the population in developed countries and 80-90% of the population in developing countries⁵. Though many studies have found the mere causal association between Helicobacter pylori and gastric cancer, there are only few studies done on association between Helicobacter pylori and grading of gastric adenocarcinomas. Developing nations like India bear higher burden of gastric carcinomas compared to that of developed nations accounting for approximately 70% of incidence. Hence this study was attempted to find the causal association of Helicobacter pylori with gastric carcinomas and its association with demographic factors and differentiation of cancer grades in our set up.

Aims and objectives:

This study was aimed to find out the prevalence of Helicobacter pylori in gastrectomy specimens and to find its association with grading of gastric adenocarcinomas and to correlate the Helicobacter pylori infection with respect to age and sex of patients and site of occurrence of gastric tumour.

Materials and Methods:

This is a retrospective study done in a tertiary care centre for a period of 3 years from 2012-2015. A random sampling of 50 consecutive specimens of gastric adenocarcinoma received during the study period was taken. The demographic characteristics of the patients were collected. The gross morphological appearance of the tumour including the site of occurrence of the lesion were noted. The tumour was microscopically graded as low and high grade adenocarcinoma after examining the tissue sections under Haematoxylin and Eosin stain. Bits were taken from the gastric antrum and sections were stained with Giemsa stain for identifying the presence of Helicobacter pylori.

Exclusion criteria:

Patients with disseminated malignancy, patients on Neoadjuvant therapy, patients with advanced malignancies involving adjacent organs, patients treated with proton pump inhibitors were excluded from this study.

Statistical analysis:

The data were entered and analysed using SPSS software version 21. Statistical significance of association between the patients' demographic parameters, site of the tumour location and degree of differentiation with the presence or absence of Helicobacter pylori were analysed using Chi square test. A p value of less than 0.05 was considered statistically significant.

Results:

Out of 50 cases of gastric adenocarcinomas, 39[78%] were males and 11[22%] were females with a male to female ratio of 3.5:1. Among the 39 male patients, 17[43.6%] were H.pylori positive and among the 11 females, 7[63.6%] were H.pylori positive [table.1]. The age of the patients ranged from 30 to 75 with the mean age of 51.75 years. The prevalence of H.pylori was maximum in the age group between 41-50 years which was statistically significant with a p value of 0.033. Regarding the location, 41/50 were located in the antropyloric region and 9/50 were located in the body and fundus region.

Among these 41 cases, 20 cases were positive for H.pylori[48.8%]. Out of the 9 cases located at the body and fundus region, 5 were positive for H.pylori[55.6%].

Among the 25 H.pylori positive adenocarcinomas, 18 were low grade and 7 were high grade adenocarcinomas. This implied that, H.pylori was more often associated with high grade than low grade gastric adenocarcinomas.

Table:1 Characteristics of study parameters with the Helicobacter pylori infection

Parameter		H.PYLORI				p Value
		NEGATIVE		POSITIVE		
		n	%	n	%	
Age	31-40	2	8%	3	12%	p=0.03 3
	41-50	11	44%	12	48%	
	51-60	7	28%	7	28%	
	>60	5	20%	3	12%	

Gender	Male	18	36%	21	42%	p=0.49
	Female	7	14%	4	8%	
Site of the tumour	Antrum and Pylorus	21	51.2%	20	48.8%	p=0.71
	Body and fundus	4	44.4%	5	55.6%	
Group	Total	25	50.0%	25	50.0%	
Grading of the tumour	Low grade	10	40%	20	80%	p=0.05
	High grade	15	60%	5	20%	
Group	Total	25	50.0%	25	50.0%	

Discussion:

Histological type influences the prognosis of gastric carcinoma. Well differentiated adenocarcinoma and intestinal type of Lauren have the best prognosis and poorly differentiated and diffuse type of Lauren with signet ring cells have the worst prognosis^{7,8}. The main aim of this study was to find the association between *Helicobacter pylori* and the grading of gastric adenocarcinomas and to find out the causal relationship between *H.pylori* and gastric carcinoma. Many authors including Parsonet et al⁹, Lin et al¹⁰ and Nomura et al¹¹ had similar observations that *H.pylori* infection increased the risk of gastric cancer.

The Male : Female ratio of gastric adenocarcinoma in this study was 3.5:1, comparable to other studies^{16,12}. The prevalence of *H.pylori* increased with age, predominantly occurred between 41-50 years and was statistically significant with p value of 0.033 whereas in the study of Lin et al¹⁰ predominant age prevalence was at 60 years.

The location of adenocarcinoma in antropyloric region was 82%[41/50] and in the body and fundus region it was 18%[9/50]. Though statistically not significant, *H.pylori* was associated more often with adenocarcinoma located at body and fundus region, with 5/9 cases[55.6%] than tumours located at antropyloric region, with 20/41 cases[48.8%].

Among the 25 *H.pylori* infected cases, there was statistical association [p=0.05] with low grade gastric adenocarcinoma 80% [20/25]. Whereas in the 25 *H.pylori* negative cases of adenocarcinoma, 15/25[60%] were high grade adenocarcinomas and 10/25[40%] were low grade adenocarcinomas, implying that genetic factors could play a major role in the pathogenesis of high grade adenocarcinoma^{13,14}.

Many epidemiological studies have consistently demonstrated an association between *Helicobacter pylori* infection and the risk of gastric cancer¹⁵.

Prospective serologic studies have reported that persons with *H.pylori* infection have a three to six fold higher risk of gastric cancer than uninfected persons¹⁵. This association seems largely restricted to intestinal type and low grade adenocarcinomas and cancers of distal stomach.

In the study of Ohkusa T et al, *H.pylori* eradication has been suggested to prevent progression and may lead to regression of precursor lesions, such as atrophic gastritis¹⁶. Houghton J et al has observed that *H.pylori* eradication in patients who have had endoscopic mucosal resection of early gastric cancer can decrease the gastric cancer recurrence¹⁷. Recent data on effects of *H.pylori* eradication on precancerous lesions as well as the reduced risk of gastric cancer development, strongly support early *H.pylori* therapy^{18,19,20}. *H.pylori* infection can thus be considered as a substantive cause of gastric cancer.

Figure.1:

Figure1A showing subtotal gastrectomy specimen with growth pyloric antrum, Figure1B showing Giemsa stain positive curved rod shaped *Helicobacter pylori* organisms inside the lumen of gastric gland.

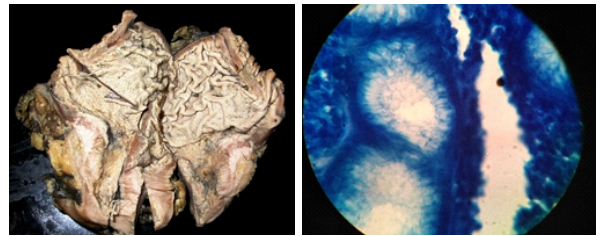


Figure 1A

Figure 1B

Conclusion:

Our study revealed that the prevalence of gastric adenocarcinoma predominantly occurred in the age group of 41-50 years with a male : female ratio 3.5:1. *Helicobacter pylori* positive gastric adenocarcinoma was more often located at the antropyloric region. *Helicobacter pylori* was more often associated with low grade than high grade gastric adenocarcinoma. *H.pylori* infection can be considered as a substantive cause of gastric cancer necessitating the screening of all high risk asymptomatic individuals for the presence of *H.pylori* infection and prophylactic *H.pylori* eradication treatment should be considered to prevent gastric malignancy.

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