Original Article

Yields of Ultrasonogram, Upper GIT Endoscopy, and Stool Antigen Test for H. pylori in Dyspeptic Patients

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Abstract

Background: Dyspepsia is a common problem of diverse etiology. This study was done to see the sonographic and endoscopic findings and H. pylori infection status of dyspeptic patients.

Materials and Methods: A Total of 156 consecutive dyspeptic patients attending outpatient department consultations were included in this cross-sectional study following inclusion and exclusion criteria. Epidemiological information, anthropometric measurements, symptoms, results of clinical examinations, and reports of investigations, specifically ultrasonography, stool antigen for H. pylori, and upper GIT endoscopy, were recorded in a predesigned data sheet. Mean and standard deviation were calculated for qualitative data. The percentage was calculated for categorical data. The Chi-square test was done to compare variables of categorical data and a P value < 0.05 was taken as significant.

Results: NAFLD, Gastro-duodenal pathology, and stool antigen for H. pylori positivity were higher in patients of the 31-50 years age group. NAFLD was significantly higher among patients from rural communities with higher BMI and higher educational backgrounds. Stool antigen for H. pylori positivity significantly differed between sexes. Endoscopic findings differed significantly within educational groups.

Conclusion: Inflammatory gastroduodenal lesions, H. pylori infection, and gallstone disease are common findings in patients with dyspepsia.

Keywords: Dyspepsia, H. pylori, Ultrasonogram, Upper GIT Endoscopy, Stool Antigen Test.

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Introduction:

Dyspepsia is defined as symptoms – pain in the epigastrium, burning in the epigastrium, early satiety, and postprandial fullness singly or in combination and arising from the upper gastrointestinal tract.[1,2] It is very common and worldwide, about 25% of the general population are suffering from dyspepsia.[1,3-5] It leads to significant morbidity that interferes with quality of life and requires huge costs for consultation, investigations, medication, and extended time.[6,7] Causes of dyspepsia are variable. It includes peptic ulcer disease, gastro-oesophageal reflux disease, gastric cancer and other tumors, gallstone disease, medication, and functional dyspepsia or non-ulcer dyspepsia.[8] Functional dyspepsia constitutes about 70-80% of total dyspeptic patients, while about 11% of patients show peptic ulcer disease by endoscopy.[9] Helicobacter pylori infection plays a significant role in peptic ulcer and gastric neoplasm. However, only *H. pylori* infection with or without an ulcer can cause dyspepsia. Eradication of *H. pylori* leads to a 25% reduction in consultations for dyspeptic patients.[10]

Among noninvasive tests for H. pylori, the stool antigen test is one with sensitivity and specificity of 94% and 97%, respectively.11 Gallstone disease can also cause dyspeptic symptoms, and transabdominal ultrasonography can detect gallstone disease with a sensitivity and specificity of more than 95%.12 Previous studies show that the prevalence of dyspepsia ranges from 8-61% in the general population.13,14 But these are uninvestigated dyspepsia. As clinical features alone cannot always reliably differentiate organic from functional dyspepsia, abdominal ultrasonogram, stool for antigen for H. pylori test, and endoscopy of the upper GI tract are important tools for evaluation of dyspepsia. 15 With this view, we designed this study to see the outcome of USG, stool antigen test for H. pylori, and upper GI tract endoscopy among dyspeptic patients in Sylhet, Bangladesh.

Materials and Methods:

This study was conducted in Popular Medical Centre, Sylhet, Bangladesh, from January 2021 to June 2021. All the consecutive patients presenting with dyspepsia attending for consultation were included. Previously diagnosed cases of peptic ulcer disease, hepato-biliary and pancreatic disease, having a history of UGI bleeding, having a history of abdominal surgery, pregnant lady, suffering from chronic debilitating disease, history of taking chemotherapy, and patients not agreeing to take part in the study were excluded. Epidemiological information, symptoms, results of clinical examinations, and reports of relevant investigations, including ultrasonography, stool antigen for *H. pylori*, and upper GIT endoscopy, were recorded in a data sheet.

Data were analyzed using SPSS version 20 (IBM Corp., Armonk, NY, USA). For continuous data, mean, standard deviation, and categorical data percentages were calculated. The Chi-square test was done to compare variables, and a P value < 0.05 was taken as significant.

Results:

A total of 156 patients, male 106 (67.9%) and female 50 (32.1%), aged varying from 16 years to 76 years (mean 42.50±14.39), were included. Of them, 134 (85.9%) were from rural areas. In this series, most of the participants, 125 (80.1%), were married. Among them, 33 (21.2%) were illiterate, while 61 (30.1%), 41 (26.3%), and 21 (13.5%) had up to primary level, up to secondary, and higher secondary level, and above education, respectively. In this study, 100 (64.1%) and 53(34.0%) were from poor, middle-class economic groups, respectively. In this series, 30 (19.2%) and 24 (15.4%) were smokers and betel nut chewers, respectively. In this series, 148 (94.9%) were taking proton pump inhibitors (PPI) and 18 (11.5%) were taking non-steroidal anti-inflammatory drugs (NSAID) (Table 1).

Table 1: Distribution of study subjects according to epidemiological data, clinical, and laboratory data (N=156)

Variables	Number (Percentage)
Sex	
Male	106 (67.9)
Female	50 (32.1)
Age	
Up to 30 years	38 (24.4)
31-50 y	76 (48.7)
51 and above	42 (26.9)
Residence	
Rural	135 (86.5)
Urban	21(13.5)
Marital status	
Married	125 (80.1)
Single	21 (13.5)
Widow/widower	10 (6.4)
Education	
Illiterate	34 (21.8)
Primary	61 (39.1)
Secondary and higher secondary	42 (26.9)
Above	19 (12.2)
Economic group	
Poor	100 (64.1)
Middle class	53 (34.0)
Rich	3 (1.9)
Other	
Smoker	30 (19.2)
Betel nut chewer	24 (15.4)
Taking PPI	148 (94.9)
Taking NSAID	18 (11.5)

Presenting complaints were abdominal pain (77; 49.4%), fullness of abdomen (47; 30.1%), early satiety, vomiting, and others (37; 23.7%), burning abdomen (12; 7.7%), and abdominal discomfort (3; 1.9%).

Ultrasonogram (USG) of the abdomen revealed gallstones in 8 (5.1%), and nonalcoholic fatty liver disease (NAFLD) in 14 (9.0%). USG scan was normal in 102 (65.4%), and the remaining 32 (20.5%) had nonspecific findings not related to the hepato-biliary system or pancreas. In this study, stool antigen for *H. pylori* was positive in 59 (37.8%).

Table 2: Distribution of study subjects according to clinical and laboratory data (N=156)

Variables	Number (%)
Symptoms	
Pain abdomen	77 (49.4)
Burning abdomen	12 (7.7)
Fullness ofthe abdomen	47 (30.1)
A bdominal discomfort	3 (1.9)
Early satiety, vomiting, and others	37 (23.7)
Ultrasonogram	
Normal	102 (65.4)
Gall stone	8 (5.1)
Non Alcoholic Fatty Liver Disease	14 (9.0)
Others	32 (20.5)
Stool Antigen Test for *H. pylori*	
Positive	59 (37.8)
Negative	97 (62.2)
Endoscopy of UGIT	
Normal	29 (18.5)
gastritis (non-erosive, erosive, pangastritis)	69 (44.23)
gastric ulcer	10 (6.4)
Duodenal ulcer, duodenitis, DU in remission	31 (19.9)
O esophagitis	4 (2.6)
Gastric and duodenal lesions	13 (8.33)

Abdominal pain (41; 26.28%) and abdominal fullness (21; 13.46%) were more common in patients of the 31 to 50 years age group. Gastro-duodenal pathology and stool antigen for *H. pylori* positivity were also more common in patients of the 31-50 years age group. Symptoms of fullness of the abdomen significantly differed among patients within age groups (Table 3).

Table 3: Relation of symptoms and investigation reports with age groups (N=156)

Variables		Up to 30 y N (%)	31-50 y N (%)	>50 y N (%)	*p value
Abdominal pain	Yes (77)	20 (25.97)	41(53.25)	16(20.78)	0.23
	No (79)	18(22.78)	35(44.30)	26(32.91)	
Burning	Yes (12)	5(41.66)	6(50.00)	1(8.33)	0.19
	No (144)	33(22.91)	55(38.19	23(15.97)	
Fullness	Yes (47)	7(14.89)	21(44.68)	19(40.42)	0.027
	No (109)	31(28.44)	55(50.46)	23(21.10)	
Discomfort	Yes (3)	1(33.33)	2(66.66)	0	0.569
	No (153)	37(24.18)	74(48.66)	42(27.45)	
Early satiety, others	Yes (38)	7(18.42)	20(52.63)	11(28.95)	0.618
	No (118)	31(26.27)	56(47.46)	31(26.27)	
PPI use	Yes (148)	35(23.65)	72(48.65)	41(27.70)	0.535
	No (8)	3(37.5)	4(50.0)	1(12.5)	
NSAID	Yes (18)	3(16.66)	11(61.11)	4(22.22)	0.521
	No (138)	35(25.36)	65(47.10)	38(27.53)	
USG of the abdomen	Normal (102)	31(30.39)	49(48.03)	22(21.57)	0.194
		2 (25.0)	3(37.5)	3(37.5)	
	NAFLD (14)	1(7.14)	8(57.14)	5(35.71	
	Other (32)	4(12.5)	13(40.62)	15(46.87)	
Stool H. pylori	Positive (59)	13(22.03)	30(50.84)	16(27.12)	0.861
	Negative (97)	25(25.77)	46(47.42)	26(26.80)	
	Normal (29)	5(17.24)	20(68.96)	4(13.79)	0.420
	Gastritis(69)	18(26.07)	30(43.48)	21(30.43)	
	DU (31)	8(25.80)	12(38.71)	11(35.48)	
	GU (10)	2(20.0)	7(70.0)	1(10.0)	
	Oesophagitis(4)	0	3(75.0)	1(25.0)	
	Others (13)	5(38.46)	4(30.77)	4(30.77)	

*Chi-Square test was done to see the level of significance.

Patients from rural communities, patients with higher BMI, and higher education levels had significantly higher incidences of NAFLD. Stool antigen for *H. pylori* positivity significantly differed within sex. Endoscopic findings differed significantly within educational groups (Tables 4,5,6,7).

Table 4: Relation of clinical and laboratory reports with sexes and residence (N=156)

Variables		Male	Female	p	Rural	Urban	*p
PPI	Y (148)	100 (67.56)	48 (32.43)	0.398	127 (85.81)	21 (14.19)	0.306
	N (8)	6(75.0)	2(25.0)		8(100.0)	0	
NSAID	Y (18)	12 (66.66)	6(33.33)	0.547	18 (100.0)	0	0.063
	No (138)	94 (68.11)	44 (31.88)		117 (84.78)	21 (15.22)	
USG	Normal (102)	70 (68.63)	32 (31.37)	0.781	94 (92.16)	8)7.84)	0.015
	Stone (8)	5(62.5)	3(37.5)		6(75.0)	2(25.0)	
	NAFLD (14)	11 (78.57)	3(21.43)		9(64.28)	5(35.72)	
	Others (32)	20 (62.5)	12 (37.5)		26 (81.25)	6(18.75)	
Stool *H. pylori*	Positive (59)	49 (83.05	10 (16.95)	0.001	53 (89.83)	6(10.17)	0.246
	Negative (97)	57 (58.76)	40 (41.24)		82 (84.54)	15 (15.46)	
Endoscopy	Normal (29)	15 (51.72)	14 (48.28)	0.310	25 (86.21)	4(13.79)	0.692
	Gastritis (69)	48 (69.56)	21 (30.44)		65 (94.2)	4(5.80)	
	DU (31)	25 (80.64)	6(19.35)		25 (80.64)	6(19.35)	
	GU (10)	8(80.0)	2(20.00)		8(80.0)	2(20.0)	
	Oesophagitis (4)	3(75.0)	1(25.0)		4(100.0)	0	
	Others (13)	7(53.85)	6(46.15)		8(61.54)	5(38.46)	

*Chi-Square test was done to see the level of significance.

Table 5: Relation of laboratory data with smoking and marita status (N=156)

Variables		Smoking			Marital status			
		Yes	No	p	Single	Married	Others	*p
USG	Normal(102)	16(15.7)	86(84.3)	0.241	20(19.6)	76(74.5	6(5.9)	0.087
	Stone(8)	1(12.5)	7(87.5)		1(12.5)	6(75.0)	1(12.5)	
	NAFLD(14)	5(35.7)	9(64.3)		0	13(92.9)	1(7.1)	
	Others(32)	8(25.0)	24(75.0)		0	30(93.8)	2(6.3)	
Stool *H. pylori*	Positive(59)	17(28.8)	42(71.2)	0.016	7(11.9)	50(84.7)	2(3.4)	0.41
	Negative(97)	13(13.4)	84(86.6)		14(14.4)	75(77.3)	8(8.2)	
Endoscopy	Normal(29)	3(10.3)	26(89.7)	0.532	0	27(93.1)	2(6.9)	0.655
	Gastritis(69)	11(15.9)	58(84.1)		10(14.5)	55(79.7)	4(5.8)	
	DU(31)	6(19.4)	25(80.7)		7(22.6)	22(70.9)	2(6.5)	
	GU(10)	3(30.0)	7(70.0)		1(10.0)	9(90.0)	0	
	Oesophagitis(4)	2(50.0)	2(50.0)		0	4(100.0)	0	
	Others(13)	5(38.5)	8(61.5)		3(23.1)	8(61.5)	2(15.4)	

*Chi-Square test was done to see the level of significance.

Table 6: Relation of laboratory data with betel nut chewing and BMI (N=156)

Variables		Betel nut chewer			BMI				p
		Yes	No	P	U wt	N wt	Owt	Obese	
USG	Normal(102)	17(16.7)	85(83.3)	0.825	24(23.5)	50(49.0)	2(1.9)	6(5.9)	0.004
	Stone(8)	1(12.5)	7(8.8)		1(12.5)	4(50.0)	3(37.5)	0	
	NAFLD(14)	1(7.1)	13(929)		0	2(14.3)	10(71.4)	2(14.3)	
	Others(32)	5(15.6)	27(84.4)		2(6.2)	14(43.8)	13(40.6)	3(9.4)	
Stool *H. pylori*	Positive(59)	6(10.1)	53(89.8)	0.118	7(11.9)	28(47.5)	21(35.6)	3(5.1)	0.391
	Negative(97)	18(18.6)	79(81.4)		20(20.6)	42(43.3)	27(27.8)	8(8.3)	
Endoscopy	Normal(29)	8(27.6)	21(72.4)	0.386	5(17.2)	13(44.9)	7(24.1)	4(13.8)	0.37
	Gastritis(69)	7(10.1)	62(89.9)		9(13.0)	28(40.6)	29(42.0)	3(4.4)	
	DU(31)	5(16.1)	26(83.9)		6(19.3)	17(54.8)	5(16.1)	3(9.7)	
	GU(10)	0	10(100.0)		2(20.0)	5(50.0)	3(30.0)	0	
	Oesophagitis(4)	1(25.0)	3(75.0)		1(25.0)	2(50.0)	1(25.0)	0	
	Others(13)	3(23.1)	10(76.9)		4(30.8)	5(38.5)	3(23.1)	1(7.7)	

BMI <18.5 = underweight, 18.55-22.9= normal, 23-24.9= overweight; ≥25= Obese

*Chi-Square test was done to see the level of significance.

Table 7: Relation of laboratory data with education and economic status (N=156)

Variables		Education				Economic group			
		Up to 5	6-12	>12	p	Poor	M.class	Rich	*p
USG	Normal(102)	64(62.7)	30(29.4)	8(7.8)	0.004	72(70.6)	29(28.4)	1(0.9)	0.271
	Stone(8)	4(50.0)	4(50.0)	0		4(50.0)	4(50.0)	0	
	NAFLD(14)	5(35.7)	3(21.4)	6(42.9)		6	7	1(7.1)	
	Others(32	22(68.8)	5(15.6)	5(15.6)		19(59.4)	12(37.5)	1(3.1)	
Stool *H. pylori*	Positive(59)	32(54.2)	20(33.9)	7(11.9)	0.299	40(67.8)	19(32.2)	0	0.368
	Negative(97)	63(64.9)	22(22.7)	12(12.4)		61(62.9))	33(34.0)	3(3.1)	
Endoscopy	Normal(29)	17(58.6)	7(24.1)	5(17.2)		16(55.2)	13(44.8)	0	0.012
	Gastritis(69)	45(65.2)	19(27.5)	5(7.2)		44(63.8)	24(34.8)	1(1.5))	
	DU(31)	16(51.6)	10(32.3)	516.1)		22(70.9)	7(22.6)	2(6.5)	
	GU(10)	5(50.0)	2(20.0)	3(30.0)		7(70.0)	3(30.0)	0	
	Oesophagitis(4)	4(100.0)	0	0		3(75.0)	1(25.0)	0	
	Others(13)	8(61.54)	4(30.8)	1(7.7)		9(69.2)	4(30.8)	0	

*Chi-Square test was done to see the level of significance.

Discussion:

In our series, abdominal pain was the most common symptom, which is consistent with another report from our country[17] and a report from China.[18] In the past, *H. pylori* infection was very common, and peptic ulcer disease was mostly associated with *H. pylori* infection. But recently the prevalence of *H. pylori* infection in the community and ulcers related to *H. pylori* infection is decreasing.[19-21] Likewise, in our series, the rate of *H. pylori* infection was low. Abstinence from PPI for 14 days is difficult in our country, and the stool antigen tests were performed without stopping PPI in our study, which might have resulted in a few false negative results and have shown a lower *H. pylori* infection rate.

In this series, dyspepsia was more prevalent among patients in the 31 to 50 years age group, followed by the older age group. However, the prevalence of dyspepsia was found to be higher among patients aged more than 45 years in Poland.[22] Our smaller sample size and environmental differences may be the cause of this difference.

In our study, more than half of the patients were from lower economic groups, which is consistent with reports from Australia,[23] the USA,[24] and Canada.[25] Dyspepsia was also more prevalent among patients with lower levels of education in our series, which is also consistent with reports from Canada.[25] Lack of health-related knowledge might have influenced this result. In our group, dyspepsia was more common among patients with lower BMI (Asia-Pacific criteria), which contradicts with report from Sweden.[26] Small sample size may be an important factor in this regard. In our series the incidence of gallstone disease is higher than another report from our country[17], but lower than that of India[28]. In our study incidence of gastroduodenal pathology was 81.5%, which was higher than another report from our country[17] and reports from India[28] and the USA.[29] Functional dyspepsia was present in only 13.46% of our series, which is much lower than other reports[17,28] and this difference may be due to higher *H. Pylori* infection. In our series, gastritis was found in about half of the total patients, which is like other reports,[17, 28] but the incidence of duodenal ulcer disease and gastric ulcer disease was higher than other reports in our country[17] and a bit lower than that of India.[28]

Conclusion:

Inflammatory gastroduodenal lesions are common endoscopic findings in dyspeptic patients. *H. pylori* infection and gallstone disease are also common findings in patients with dyspepsia. NAFLD is also a common finding in dyspeptic patients. This is a single-center study with a relatively small sample size, which may limit the acceptance of the study findings to represent other populations of different ethnic groups. Studying with a large sample size and multiple centers is recommended to comment on nationwide findings.

Conflicts of Interest: There is no conflict of interest.

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