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A Descriptive Cross-Sectional Study on Clinico-Endoscopic Profile of Patients Presenting with Dyspepsia

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ABSTRACT

Background: Dyspepsia is defined as an upper gastrointestinal symptom complex, characterized by epigastric pain and/or discomfort for minimum four weeks including burning sensation and may also comprise abdominal bloating, heartburn, early satiety or nausea, acid regurgitation, feeling of abnormal or slow digestion and excessive burping/belching. the most common causes of dyspepsia are peptic ulcer disease, gastro-esophageal reflux (with or without esophagitis), and malignancy. This study was carried out to describe the clinical, endoscopic and epidemiological profile of patients presenting with dyspepsia.
Methods: A descriptive cross-sectional study was done on 145 subjects presenting with dyspepsia (>1-month duration) in Department of General Surgery, Shri Sathyasai Medical College and Research Institute, Ammapettai, Kanchipuram from January 01, 2018 - June 30, 2019. Detailed history including symptoms at presentation, ALARM symptom and Upper Gastrointestinal endoscopy was done. Categorical outcomes were compared using Chi square /Fisher's test. P value < 0.05 was statistically significant.
Results: The mean age was (43.14±13.88) years. 55.9% males and 44.1% females. 22.76% participants were smokers, 30.34% alcoholics33.79% had diabetes and14.48% had hypertension. Antral gastritis (26.9%), GERD (17.24%), pangastritis (16.55%), hiatus hernia (8.97%), stomach carcinoma (6.2%) and esophageal carcinomas (1.4%) were diagnosed in endoscopic examination. Nausea (82.07%), Heartburns (60.69%), Epigastric pain (57.93%) were major presenting symptoms. Among the study population, 55 (37.93%) participants had alarm symptoms. Diabetic patients showed statistically significant association with Alarm symptom ($p<0.001$).
Conclusion: In our study, the most common endoscopic finding was antral gastritis and the predominant symptoms were Epigastric pain, Nausea, Heart burns and Anorexia. Patients who are diabetic showed an increase in Alarm symptoms.
Key words: dyspepsia, antral gastritis, risk factors, alarm symptoms, Helicobacter Pylori

INTRODUCTION

A chronic or a recurrent pain or sometimes only a discomfort, centered around the abdomen is called dyspepsia (1). It is defined as an upper gastrointestinal symptom complex, characterized by epigastric pain and/or discomfort for minimum four weeks including burning sensation and may also comprise abdominal bloating, heartburn, early satiety or nausea, acid regurgitation,

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feeling of abnormal or slow digestion and excessive burping/belching (2). These symptoms are frequently congregated into subcategories: dysmotility-like, ulcer-like, reflux-like or unspecified dyspepsia. "Rome III criteria" defines dyspepsia as "the presence of symptoms considered by the physician to originate from the gastroduodenal region with one or more of the following 3 symptoms for 3 months within the initial 6 months of symptom onset: 1. post prandial fullness, 2. early satiety, and 3. epigastric pain or burning" (3). Peptic ulcer disease, gastro-esophageal reflux (with or without esophagitis), and malignancy are the most common causes of dyspepsia. But in 50% to 70% of patients with chronic dyspepsia, structural causes cannot be identified and is called as functional or non-ulcer dyspepsia (4). The form known as non-ulcer dyspepsia is generally comprised of a group of symptoms which mimics peptic ulcer in persons who do not have an ulcer endoscopically. Those with non-ulcer dyspepsia are again sorted into two types. One is pseudo-ulcer syndrome, and the second is functional dyspepsia. Pseudo-ulcer syndrome is a clique of classical symptoms of ulcer disease whereas in functional dyspepsia there will be post prandial fullness along with belching, prolonged gastric emptying and bloating. Alarm symptoms in the context of dyspepsia refers to sudden or new onset complaints/signs such as anorexia, significant weight loss, recent increase of dyspepsia like symptoms, haematemesis and Malena (5). In general there are functional elements which are ascribed to motor activity without any co-ordination and hyper activity of afferent nerves (6). In a developing country like India, with high prevalence of Helicobacter pylori infection6 and restrictions to GI endoscopy, dyspepsia is a frequently encountered symptom. The prevalence of un-investigated dyspepsia was around 30.4% with a 81% sero prevalence of Helicobacter pylori infection in a study by Shah SS et al in India (7). This study had also observed that prevalence of dyspepsia was more in adults aged more than 40 years (7). Upper gastrointestinal endoscopy is a widely accepted investigation modality for identifying structural diseases in dyspepsia. The main benefit of negative endoscopy is that it lessens the fear of the patient and markedly upsurges patient satisfaction (8). Carcinomas can be effortlessly identified earlier by endoscopy in patients having dyspepsia. Patients with alarm symptoms such as weight loss, anorexia, recent increase of symptoms, hematemesis and Malena are more prone to have significant findings in endoscopy, higher morbidity and mortality (1,9). Endoscopy can help in early diagnosis and treatment of dyspepsia as well as early detection of malignancy in patients with dyspepsia. But there is a lack of literature with regards to clinic-epidemiological profile of dyspepsia in India. Hence this descriptive study was carried out to assess the clinical, endoscopic and epidemiological profile of patients presenting with dyspeptic symptoms of more than 1 month and the association of symptoms with endoscopic findings.

METHODOLOGY

A descriptive cross sectional study was done on 145 subjects presenting with dyspeptic symptoms of more than 1 month duration in the Department of General Surgery, Shri Sathya Sai Medical College and Research Institute, Ammapettai, Kanchipuram from January 01, 2018 to June 30, 2019. The study included all patients of both genders from age 18-60 years. This study excluded patients who had history of gastro-intestinal malignancy and those who were found to be unfit for endoscopy due to associated comorbidities.

Sample size was calculated assuming the proportion of Dyspepsia as 30.4% as per the study by Sundeep S Shah et al (7). The other parameters considered for sample size calculation were 8% absolute precision and 95% confidence level. The following formula was used

$$N = \frac{Z^2 P(1-P)}{d^2}$$

for sample size as per the study by Daniel WW et al (10).

Where n = Sample size

Z = Z statistic for a level of confidence level= 1.960

P = Expected prevalence/proportion of outcome = 0.304

d = Precision= 0.08

The required sample size as per the above-mentioned calculation was 127. To account for a non-participation rate of about 15%, another 18, subjects will be added to the sample size. Hence the final required sample size would be 145.

After attaining scientific and ethical committee approval all patients were explained about the study and its merits, the procedure, & its complications. Informed written consent was acquired from all patients before beginning the procedure. Detailed history was taken and patients were evaluated for alarm symptoms like anorexia, weight loss, sudden

increase in epigastric pain, hematemesis/malena (5). Socio-demographic factors like age, sex, place, history of smoking/alcoholism/co-morbid illness/malignant disease, time of admission to hospital since time of onset of symptoms were taken into account. Investigations namely complete hemogram, chest x ray, ECG and Viral Markers were done. Upper gastro-intestinal (GI) endoscopy was done and the endoscopic findings were documented.

Statistical mehtods

Risk factors including gender, smoking, alcohol (1), symptoms at presentation, alarm symptoms were considered as primary explanatory variables. Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. Non-normally distributed quantitative variables were summarized by median and interquartile range (IQR). Data was also represented using appropriate diagrams like bar diagram, pie diagram and box plots. All quantitative variables were checked for normal distribution within each category of explanatory variable by using visual inspection of histograms and normality Q-Q plots. Shapiro- wilk test was also conducted to assess normal distribution. Shapiro wilk test p value of > 0.05 was considered as normal distribution. Categorical outcomes were compared between study groups using Chi square test /Fisher's Exact test (If the overall sample size was < 20 or if the expected number in any one of the cells is < 5, Fisher's exact test was used). P value < 0.05 was considered statistically significant. IBM SPSS version 22 was used for statistical analysis (11).

RESULTS

A total of 145 subjects were included in the final analysis. The mean age was 43.14 ± 13.88 years and the range was 19 to 87 years. Among the study population, 81 (55.9%) participants were males and 64 (44.1%) participants were females. 30.34% of participants were alcoholics and 22.76% participants were smokers. Among the study population, 21 (14.48%) participants had hypertension and 49 (33.79%) participants had diabetes. With regards to symptoms at presentation, majority of (82.07%) participants had nausea, followed by heart burns (60.69%). 84 (57.93%) participants had epigastric pain, 80 (55.17%) participants had regurgitation of food, 77 (53.10%) participants had early satiety, 73 (50.34%) participants had vomiting, 68 (46.90%) participants had epigastric discomfort, 58 (40%) participants had belching/ burping, 51 (35.17%) participants had feeling of abnormal or slow digestion and 29 (20%) participants had abdominal bloating (*table 1*). Out of 145 patients who underwent UGI endoscopy, biopsy was taken only for 121 patients who were found to be having positive findings. All 121 patients were tested for H. Pylori and and 57 of them tested positive for H. Pylori. In 24 patients who either had normal gastric and duodenal mucosa, or in cases where the stomach could not be accessed such as in carcinoma oesophagus, biopsy for H. Pylori was not done (*table 2*).

Table 1 - Summary of baseline characteristics of the study population (N=145)

Baseline characteristics	Frequency (%) or Mean ± S.D.
Mean age in years	43.14 ± 13.88 (19 to 87)
Gender	
I. Male	81 (55.9%)
II. Female	64 (44.1%)
Smoking	33 (22.76%)
Alcoholism	44 (30.34%)
Hypertension	21 (14.48%)
Diabetes	49 (33.79%)
Other Chronic Disorders	2 (1.38%
Symptoms	
I. Heart Burns	88 (60.69%)
II. Epigastric Pain	84 (57.93%)
III. Early Satiety	77 (53.1%)
IV. Epigastric Discomfort	68 (46.9%)
V. Belching/Burping	58 (40%)
VI. Regurgitation Of Food	80 (55.17%)
VII. Nausea	119 (82.07%)
VIII. Vomiting	73 (50.34%)
IX. Abdominal Bloating	29 (20%)
X. Feeling of abnormal or slow digestion	51 (35.17%)
Alarm symptoms	55 (37.93%)
I. Recent increase of symptoms	18 (12.4%)
II. Malena	9 (6.2%)
III. Weight Loss	19 (13.1%)
IV. Anorexia	25 (17.2%)
V. Hematemesis	28 (19.3%

Among the study population, 55 (37.93%) participants had alarm symptoms. 19.3% of participants had hematemesis, followed by anorexia in 25 (17.2%) participants. 19 (13.1%) participants had weight loss, 18 (12.4%) participants had recent increase of symptoms and 9 (6.2%) participants had malena (*table 1*).

Among the study population, 39 (26.90%) participants had antral gastritis, 25 (17.24%) participants had gerd, 24 (16.55%) participants had pangastritis, 13 (8.97%) participants had hiatus hernia, 12 (8.28%) participants had normal alarm signs, 9 (6.2%) participants had carcinoma stomach, 2 (1.4%) participants had carcinoma oesophagus, 8 (5.52%) participants had Duodenitis, 6 (4.14%) participants

Table 2 - Endoscopic diagnosis in the study population (N=145)

Endoscopic diagnosis	Frequency (%) (N=145)	H. Pylori positive frequency (N=57)
Antral Gastritis	39 (26.90%)	21 (36.84%)
GERD	25 (17.24%)	10 (17.54%)
Pangastritis	24 (16.55%)	16 (28.07%)
Hiatus Hernia	13 (8.97%)	1 (1.75%)
Normal	12 (8.28%)	Not done
Carcinoma Stomach	9 (6.2%)	5 (8.77%)
Carcinoma Oesophagus	2 (1.4%)	Not done
Duodenitis	8 (5.52%)	4 (7.02%)
Esophageal & Fundal Varices	6 (4.14%)	Not done
Esophageal Candidiasis	3 (2.07%)	0 (0%)
Extrinsic compression on the stomach	2 (1.38%)	Not done
Mass Pyriform fossa	1 (0.69%)	Not done
Submucosal Duodenal polyp	1 (0.69%)	Not done

had Esophageal & Fundal Varices, 3 (2.07%) participants had Esophageal Candidiasis, 2 (1.38%) participants had extrinsic compression on the stomach and 1 (0.69%) participant had mass pyriform fossa and submucosal duodenal polyp each (*table 2*).

There was no significant association between baseline risk factors such as gender distribution, smoking, alcoholism, hypertension and other chronic disorders with alarm symptoms. But there was a significant association between diabetes mellitus and alarm symptoms with a P-value of <0.001. There was no significant association between various symptoms at presentation and alarm symptoms. Only epigastric pain (p<0.075) and early satiety (p<0.074) had significant association with alarm symptoms (*table 3*).

Among the people with alarm symptoms, 16 (29.09%) participants had antral gastritis, 10 (18.18%) participants had pan gastritis and another 18.18% had carcinoma stomach or oesophagus. 8 (14.55%) participants had GERD, 4 (7.27%) participants had esophageal & fundal varices and 2 (3.64%) participants had hiatus hernia (*table 4*). 36.84% patients showed presence of H Pylori who were diagnosed antral gastritis followed by pangastritis (28.07%), GERD (17.54%), carcinoma stomach (8.77%), duodenitis (7.02%) and hiatus Hernia (1.75%) (*table 5*).

DISCUSSION

Dyspepsia is a relatively common complaint in day to day practice. It is a vague term used to explain upper abdominal collection of symptoms like indigestion, fullness, early satiety, bloating, belching, nausea, epigastric discomfort or pain and anorexia. In our study, the mean age at presentation was 43.14 ± 13.88 years. The oldest patient was 87 years old while the youngest was 19 years old. The findings of our study were similar to that of Desai SB et al (1), Azzam NA et al (12), Thomson ABR et al. (13) The mean age was 40.3 years in the study by Azzam NA et al. (11) 81 (55.9%) participants were males in the present study while 21 (14.48%) participants had hypertension and 49 (33.79%) participants had diabetes. 30.34% of participants were alcoholics and 22.76% participants were smokers. The male predominance in the present study could be due to the increased consumption of alcohol and tobacco by males compared to females causing dyspepsia. It could also be due to the fact that fewer symptomatic women come for treatment compared to men. In the study by Desai SB et al (1), 15.19% were smokers, 38.61% were alcoholics.

With regards to symptoms at presentation, majority of (82.07%) participants had nausea, followed by heart burns (60.69%). 57.93% had epigastric pain while 55.17% had regurgitation of food. In the study by Odeghe EA et al (14), the most frequent dyspeptic symptom was epigastric pain/burning sensation (75%), while the commonest alarm features were recent onset dyspepsia in a patient over 45 years (79%) and unexplained weight loss (28.6%). Alarm symptoms such as weight loss, anemia, UGI bleed were observed in 18.35% patients in the study (1) while in the present study alarm symptoms were observed in 37.93% of patients.

Prompt endoscopy should be considered as an initial strategy for uninvestigated dyspepsia in the background of high prevalence of Helicobacter pylori infection and malignancy. However, with changes of

Table 3 - Association between various risk factors and Alarm symptoms (N=145)

Baseline risk factors	Alarm symptoms		Chi square	P value
	Yes (N=55)	No (N=90)		
Gender				
Male	31 (56.36%)	50 (55.56%)	0.009	0.924
Female	24 (43.64%)	40 (44.44%)		
Smoking				
Yes	14 (25.45%)	19 (21.11%)	0.366	0.545
No	41 (74.55%)	71 (78.89%)		
Alcoholism				
Yes	17 (30.91%)	27 (30%)	0.013	0.908
No	38 (69.09%)	63 (70%)		
Diabetes				
Yes	29 (52.73%)	20 (22.22%)	14.199	<0.001
No	26 (47.27%)	70 (77.78%)		
Hypertension				
Yes	11 (20%)	10 (11.11%)	2.178	0.140
No	44 (80%)	80 (88.89%)		
Other Chronic Disorders				
Yes	0 (0%)	2 (2.22%)	*	*
No	55 (100%)	88 (97.78%)		
Epigastric Pain				
Yes	37 (67.27%)	47 (52.22%)	3.173	0.075
No	18 (32.73%)	43 (47.78%)		
Epigastric Discomfort				
Yes	23 (41.82%)	45 (50%)	0.918	0.338
No	32 (58.18%)	45 (50%)		
Heart Burns				
Yes	38 (69.09%)	50 (55.56%)	2.622	0.105
No	17 (30.91%)	40 (44.44%)		
Early Satiety				
Yes	24 (43.64%)	53 (58.89%)	3.189	0.074
No	31 (56.36%)	37 (41.11%)		
Belching/Burping				
Yes	23 (41.82%)	35 (38.89%)	0.122	0.727
No	32 (58.18%)	55 (61.11%)		
Regurgitation Of Food				
Yes	31 (56.36%)	49 (54.44%)	0.051	0.822
No	24 (43.64%)	41 (45.56%)		
Nausea				
Yes	46 (83.64%)	73 (81.11%)	0.148	0.701
No	9 (16.36%)	17 (18.89%)		
Vomiting				
Yes	27 (49.09%)	46 (51.11%)	0.056	0.813
No	28 (50.91%)	44 (48.89%)		
Abdominal Bloating				
Yes	11 (20%)	18 (20%)	0.000	1.000
No	44 (80%)	72 (80%)		
Feeling of Abnormal or Slow Digestion				
Yes	22 (40%)	29 (32.22%)		
No	33 (60%)	61 (67.78%)	0.906	0.341

disease patterns and dyspepsia definition, the prevalence of organic lesions at endoscopy in dyspepsia patients and the predictive values of alarm features and age for in malignancy remain unclear in the Asian population. In current study, the most common findings were antral gastritis (26.90%), GERD (17.24%), Pangastritis (16.55%). 8.97% had hiatus hernia while only 8.28% had normal endoscopy. 9 (6.2%) participants had carcinoma of stomach while 1.4% had carcinoma of esophagus. Initial and earlier endoscopy can result in decrease in the practice of use of proton pump inhibitors and increase in the quality of life by planning treatment. The outcome of patient can be improved by early identification and management at initial stage (1). The dyspepsia syndrome may certainly have diverse causative dynamics in different persons. In a systematic review, the malignancy detection rate and proportion of young cancer patients were high among Asian dyspepsia patients. Alarm features and age were of limited value for predicting malignancy, and

Table 4 - Association between Endoscopic diagnosis and Alarm symptoms (N=145)

Endoscopic Diagnosis	Alarm Symptoms	
	Yes (N=55)	No (N=90)
Antral Gastritis	16 (29.09%)	23 (25.56%)
Pangastritis	10 (18.18%)	14 (15.56%)
Carcinoma Stomach oroesophagus	10 (18.18%)	1 (1.11%)
Gerd	8 (14.55%)	17 (18.89%)
Esophageal & Fundal Varices	4 (7.27%)	2 (2.22%)
Hiatus Hernia	2 (3.64%)	11 (12.22%)
Duodenitis	2 (3.64%)	6 (6.67%)
Normal	1 (1.82%)	11 (12.22%)
Esophageal Candidiasis	1 (1.82%)	2 (2.22%)
Extrinsic Compression On The Stomach	1 (1.82%)	1 (1.11%)
Mass Pyriform Fossa	0 (0%)	1 (1.11%)
Submucosal Duodenal Polyp	0 (0%)	1 (1.11%)

* No statistical test was applied-due to 0 subjects in the cell.

prompt endoscopy should be considered as the initial strategy for dyspepsia in Asian populations. The optimal age threshold for endoscopy screening in Asia might be 35 years (15). In another study, the endoscopic diagnosis of uninvestigated dyspepsia had a predominance of functional disease, whereas cancer was an uncommon finding, despite the high prevalence of H. pylori. Organic dyspepsia was associated with infection, age and smoking status (16). In the study by Odeghe EA et al, endoscopy was normal in 26%. The most frequent significant endoscopic findings were gastritis (49%) and gastric ulcer (17%) and they were not associated with alarm features. They observed that the pooled sensitivity, specificity, positive predictive value, and negative predictive value of the alarm features were 65%, 49%, 71% and 41% respectively. Abdeljawad K et al (9) in their study observe that 51% had a normal endoscopy. The most common endoscopic abnormality was non erosive gastritis (29.7%) followed by non-erosive duodenitis (7.2%). The occurrence of GERD has augmented intensely in recent decades, mainly in the western circle, where it shakes about 19% - 30% of the people, expanding the chance for esophageal adenocarcinoma (17).

In the present study, 37.93% had alarm symptoms. On evaluating the association between various risk factors and presence of alarm symptoms, diabetes ($p<0.001$), epigastric pain ($p<0.075$) and early satiety ($p<0.074$) had significant association. Abdeljawad K et al (9) in their study observed that the presence of any

Table 5 - Association between Endoscopic diagnosis and H. Pylori (N=121)

Endoscopic diagnosis	H. Pylori	
	Positive (N=57)	Negative (64)
Antral Gastritis	21 (36.84%)	19 (29.69%)
GERD	10 (17.54%)	17 (26.56%)
Pangastritis	16 (28.07%)	11 (17.19%)
Hiatus Hernia	1 (1.75%)	4 (6.25%)
Normal	Not done	Not done
Carcinoma Stomach	5 (8.77%)	9 (14.06%)
Carcinoma Oesophagus	Not done	Not done
Duodenitis	4 (7.02%)	4 (6.25%)
Esophageal & Fundal Varices	Not done	Not done
Esophageal Candidiasis	0 (0%)	0 (0%)
Extrinsic compression on the stomach	Not done	Not done
Mass Pyriform fossa	Not done	Not done
Submucosal Duodenal polyp	Not done	Not done

alarm feature and age ≥ 55 are associated with higher risk of significant endoscopic findings. Abdeljawad K et al (9) in their study observe that endoscopy in young patients with no alarm features has a low yield; these patients can be considered for non-endoscopic approach for diagnosis and management. Ford AC et al (18) in their systematic review observed that the individuals with dyspepsia have an 8-fold increase in prevalence of Irritable Bowel Syndrome compared with the population. In current study there are nine patients who are diagnosed with carcinoma of stomach that accounts for 6.2% and there was one patient diagnosed as carcinoma of esophagus that accounts for 1.4% which are consistent with other studies like Khan N et al (3). The occurrence of GERD has augmented intensely in recent decades, mainly in the western circle, where it shakes about 19% - 30% of the people, expanding the chance for esophageal adenocarcinoma (17).

The amount of clinically significant endoscopic findings in dyspepsia influences the initial treatment of this disease. Old people who are having dyspeptic symptoms should be evaluated for carcinoma as early as possible.

The study was limited by its small sample size and external validity of the results. Being a hospital based sample, selected by convenient sampling, the generalizability of the results is poor. Our study was only a descriptive study generating a hypothesis about the clinical, epidemiological and endoscopic profile of patients presenting with dyspepsia. Further large scale multi-centric studies focusing on alarm symptoms and their use as a predictive tool for malignancy or significant endoscopic findings are the need of the hour.

CONCLUSION

In our study, the most common endoscopic finding were antral gastritis, GERD, pangastritis, hiatus hernia, duodenitis, carcinoma Stomach and oesophagus. The predominant symptoms were Epigastric pain, Nausea, Heart burns and Anorexia. Patients who are diabetic showed an increase in Alarm symptoms.

Conflict of interest

All author declare that they have no conflict of interest.

Ethical approval

Obtained as per guidelines.

REFRENCES

1. Desai SB, Mahanta BN. A study of clinico-endoscopic profile of patient presenting with dyspepsia. Clin Epidemiol Glob Health. 2018;6(1):34-8.
2. Ghoshal UC, Singh R, Chang F-Y, Hou X, Wong BCY, Kachintorn U, et al. Epidemiology of uninvestigated and functional dyspepsia in Asia: facts and fiction. J Neurogastroenterol Motil. 2011; 17(3):235-44.
3. Ford AC, Bercik P, Morgan DG, Bolino C, Pintos-Sanchez MI, Moayyedi P. The Rome III criteria for the diagnosis of functional dyspepsia in secondary care are not superior to previous definitions. Gastroenterology. 2014;146(4):932-40; quiz e14-5.
4. Baker G, Fraser RJ, Young G. Subtypes of functional dyspepsia. World J Gastroenterol. 2006;12(17):2667-71.
5. Gunderson LL, Donohue JH, Alberts SR, Ashman JB, Jaroszewski DE. Cancer of the Stomach and Gastroesophageal Junction. In: Niederhuber, JE, Armitage, JO, Doroshow, JH, Kastan, MB, Tepper, JE, eds. In Abeloff's Clinical Oncology. 5th ed. Philadelphia, Pa: Elsevier; 2014:1240-1270.
6. Ikenberry SO, Harrison ME, Lichtenstein D, Dominitz JA, Anderson MA, Jagannath SB, et al. The role of endoscopy in dyspepsia. Gastrointest Endosc. 2007;66(6):1071-5.
7. Shah SS, Bhatia SJ, Mistry FP. Epidemiology of dyspepsia in the general population in Mumbai. Indian J Gastroenterol. 2001; 20(3):103-6.
8. Sumathi B, Navaneethan U, Jayanthi V. Appropriateness of indications for diagnostic upper gastrointestinal endoscopy in India. Singapore Med J. 2008;49(12):970-6.
9. Abdeljawad K, Wehbeh A, Qayed E. Low Prevalence of Clinically Significant Endoscopic Findings in Outpatients with Dyspepsia. Gastroenterol Res Pract. 2017;2017:3543681.
10. Daniel WW. Determination of sample size for estimating proportions. Biostatistics A foundation for analysis in the health sciences. 1999;8:189-90..
11. IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.
12. Azzam NA, Almadi MA, Alamar HH, Almalki LA, Alrashedi RN, Alghamdi RS, et al. Performance of American Society for Gastrointestinal Endoscopy guidelines for dyspepsia in Saudi population: prospective observational study. World J Gastroenterol. 2015;21(2):637-43.
13. Thomson AB, Barkun AN, Armstrong D, Chiba N, White RJ, Daniels S, et al. The prevalence of clinically significant endoscopic findings in primary care patients with uninvestigated dyspepsia: the Canadian Adult Dyspepsia Empiric Treatment - Prompt Endoscopy (CADET-PE) study. Aliment Pharmacol Ther. 2003;17(12):1481-91.
14. Odeghe EA, Adeniyi OF, Oyeleke GK, Keshinro SO. Use of alarm features in predicting significant endoscopic findings in Nigerian patients with dyspepsia. Pan Afr Med J. 2019;34:66-.
15. Chen SL, Gwee KA, Lee JS, Miwa H, Suzuki H, Guo P, et al. Systematic review with meta-analysis: prompt endoscopy as the initial management strategy for uninvestigated dyspepsia in Asia. Aliment Pharmacol Ther. 2015;41(3):239-52.
16. Faintuch JJ, Silva FM, Navarro-Rodriguez T, Barbuti RC, Hashimoto CL, Rossini AR, et al. Endoscopic findings in uninvestigated dyspepsia. BMC Gastroenterol. 2014;14:19.
17. .Erichsen R, Robertson D, Farkas DK, Pedersen L, Pohl H, Baron JA, et al. Erosive reflux disease increases risk for esophageal adenocarcinoma, compared with nonerosive reflux. Clin Gastroenterol Hepatol. 2012;10(5):475-80.e1.
18. Ford AC, Marwaha A, Lim A, Moayyedi P. Systematic review and meta-analysis of the prevalence of irritable bowel syndrome in individuals with dyspepsia. Clin Gastroenterol Hepatol. 2010;8(5): 401-9.