

## TO INVESTIGATE THE CLINICAL FEATURES AND ENDOSCOPIC FINDINGS IN PATIENTS WITH SYMPTOMATIC DYSPESIA

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### Abstract

**Background:** Dyspepsia is a commonly observed syndrome in our nation, characterised by the presence of limitations in endoscopic procedures and a significant prevalence of *H. pylori* infection. The identification of the underlying causes of dyspepsia is crucial in order to facilitate the development of effective therapeutic strategies. **Aim:** To investigate the clinical features and endoscopic findings in patients with symptomatic dyspepsia. **Materials and Methods:** The present study encompassed individuals who underwent endoscopy for the purpose of diagnosing dyspepsia at our medical facility. The individuals under study exhibited a minimum of one of the subsequent symptoms: postprandial fullness, early satiation, epigastric pain, and epigastric burning. These symptoms should have persisted for a duration of more than 3 months, with the onset of the symptom occurring at least 6 months prior. Prior to undergoing endoscopy, a comprehensive assessment of all study participants was conducted utilising a questionnaire that closely resembled the LDQ. **Results:** The study sample consisted of 100 cases, with 38 (38%) being male and 62 (62%) being female. The primary symptoms observed in the study population included epigastric pain, which was reported in 58 cases (58%), epigastric burning in 35 cases (35%), bloating in 67 cases (67%), belching in 44 cases (44%), early satiety in 22 cases (22%), and nausea in 23 cases (23%). The number of patients that had EPS, PDS, EPS-PDS were 25 (25%), 40 (40%) and 35(35%), respectively. The overall findings were observed in 70 out of 100 cases, representing a percentage of 70%. The study observed a prevalence of 48% for chronic superficial gastritis and 22% for chronic atrophic gastritis. These findings encompassed esophageal lesions in 16 patients (16%), peptic ulcer in 12 patients (12%), and malignancy in 2 patients (2%). **Conclusion:** The findings of our study revealed a notable prevalence of CSFs among dyspeptic patients who exhibited no premonitory symptoms, as per the Rome IV diagnostic criteria. Gastroscopy holds considerable implications in the evaluation of dyspeptic patients, particularly in individuals presenting with independent risk factors.

## INTRODUCTION

Dyspepsia is not considered a definitive medical diagnosis, but rather a collection of symptoms that are associated with the upper gastrointestinal tract. The incidence of dyspepsia is widespread, resulting in significant demands on healthcare resources and imposing a substantial economic burden. Dyspepsia is a term that encompasses a variety of symptoms, including nausea, bloating sensation, epigastric burning sensation and pain, indigestion, and heartburn.<sup>[1]</sup> The worldwide prevalence of dyspepsia is estimated to range from 20% to 30%, while in India, the prevalence is reported to be approximately

30% to 49%. Dyspepsia has been defined by an international committee of clinical investigations as a condition characterised by the presence of one or more symptoms, including postprandial fullness, early satiation, and epigastric pain or burning. Dyspepsia is also associated with significant gastrointestinal pathological conditions such as malignancy, stricture, or ulceration. Patients with dyspepsia are classified as high risk if they are over the age of 50 and present with new-onset dyspepsia, a family history of cancer, sudden weight loss, hematemesis, melena, dysphagia, and persistent vomiting.<sup>[2]</sup> The initial evaluation of a patient presenting with dyspeptic symptoms typically involves the recommendation of endoscopy as the

primary investigative procedure. The most frequently documented significant endoscopic abnormalities include gastric ulcer, duodenal ulcer, oesophagitis, and gastric malignancy.<sup>[3]</sup> The correlation between the organic aetiology of dyspepsia and the manifestation of dyspeptic symptoms can frequently be ambiguous, as the resolution of the underlying organic cause does not consistently lead to complete alleviation of symptoms.<sup>[4]</sup> The association between mild or equivocal endoscopic inflammatory gastroduodenal abnormalities and dyspeptic symptoms is perplexing, as evidenced by the weak or absent correlation between erythematous/exudative duodenitis or gastritis and symptoms.<sup>[5]</sup> When examining patients with dyspepsia and comparing their endoscopic findings to those of controls who are matched in terms of age and sex, there is generally no significant correlation between these findings and the presence of dyspeptic symptoms. However, it is worth noting that there may be some exceptions to this, specifically in cases where endoscopy reveals the presence of peptic ulcer disease or duodenitis. Surgeons have faced challenges in achieving early diagnosis of gastric carcinoma primarily due to the presence of nonspecific upper gastrointestinal (UGI) symptoms such as dyspepsia. A significant proportion of individuals remain undiagnosed during the initial stages, subsequently manifesting with advanced stages of the disease. Early gastric cancer refers to a type of gastric carcinoma that is limited to the mucosa or submucosa, regardless of the involvement of lymph nodes. This stage of gastric cancer is associated with a favourable prognosis, as indicated by a 5-year survival.<sup>[6-8]</sup> According to the revised Rome IV classification, it is essential to consider both postprandial fullness and early satiation, along with EPS symptoms, when identifying symptoms that are considered bothersome. The Rome IV classification encompasses not only the presence of PDS and EPS individually, but also the coexistence of PDS and EPS.

## MATERIALS AND METHODS

The present study encompassed individuals who underwent endoscopy for the purpose of diagnosing dyspepsia at our medical facility. The individuals under study exhibited a minimum of one of the subsequent symptoms: postprandial fullness, early satiation, epigastric pain, and epigastric burning. These symptoms should have persisted for a duration of more than 3 months, with the onset of the symptom occurring at least 6 months prior. The exclusion criteria encompassed the following factors: The prevailing manifestations of GERD, including the occurrence of reflux and heartburn, the presence of one or more warning features is indicative of certain conditions. These features

include a family history of upper gastrointestinal malignancy, unintended weight loss, signs of bleeding or iron deficiency anaemia, progressive dysphagia, persistent vomiting, palpable mass or lymphadenopathy, jaundice, previous history of gastrointestinal surgery, malignancy, liver failure, gallbladder stones, and cholecystitis. Prior to the commencement of the study, the administration of nonsteroidal anti-inflammatory drugs, as well as proton pump inhibitors or H2 blockers, was observed. Prior to undergoing endoscopy, a comprehensive assessment of all study participants was conducted utilising a questionnaire that closely resembled the LDQ.<sup>[10]</sup>

### Methodology

The outpatient procedure of endoscopy was conducted using a standard endoscope manufactured by Olympus, under the expertise of an experienced endoscopist. The endoscopic observations were categorised into two groups: specific findings related to CSFs and general findings. The CSFs encompassed reflux esophagitis, Barrett's oesophagus, peptic ulcer, malignancy, and other related conditions. The overall findings encompassed chronic atrophic gastritis or chronic superficial gastritis. Simultaneous performance of hematoxylin and eosin staining for histological changes and Warthin-Starry staining for examining *H. pylori* infection was conducted during the process of mucosal biopsy. The histopathological examination confirmed the diagnoses of upper gastrointestinal cancer.

### Statistical Analysis

The statistical analyses were conducted using SPSS version 24.0 and were subjected to statistical review by a biomedical statistician. Patient demographics were characterised using descriptive statistics. The mean and standard deviation were used to present continuous variables, while number and percentage were employed to represent categorical data. The one-way analysis of variance (ANOVA) was employed to compare the continuous variables, while the Chi-squared test was utilised to analyse the categorical variables. The study employed multivariate logistic regression analysis to investigate the relationship between various risk factors and the presence of CSFs. The findings were presented in the form of odds ratios, accompanied by a 95% confidence interval (CI). A significance level of  $P < 0.05$  was deemed to indicate statistical significance.

## RESULTS

The study sample consisted of 100 cases, with 38 (38%) being male and 62 (62%) being female. The average age of the participants was 50.89 years with a standard deviation of 7.98 years, while the average body mass index (BMI) was 22.79 kg/m<sup>2</sup> with a standard deviation of 4.81 kg/m<sup>2</sup>. The primary symptoms observed in the study population included

epigastric pain, which was reported in 58 cases (58%), epigastric burning in 35 cases (35%), bloating in 67 cases (67%), belching in 44 cases

(44%), early satiety in 22 cases (22%), and nausea in 23 cases (23%).

**Table 1: Basic profile of the participants**

Gender	Number	Percentage
Male	38	38
Female	62	62
Age in years		
Below 45	47	47
Above 45	53	53
Mean Age	50.89 ± 7.98	
BMI	22.79 ± 4.81	
Epigastric pain	58	58
Epigastric burning	35	35
Bloating	67	67
Belching	44	44
Early satiety	22	22
Nausea	23	23
H. pylori positive	26	26

**Table 2: Clinical profile of the patients**

	Number	Percentage
General lesions	70	70
Esophageal lesions	16	16
Peptic ulcer	12	12
Malignancy	2	2

The number of patients that had EPS, PDS, EPS-PDS were 25 (25%), 40 (40%) and 35(35%), respectively.

**Table 3: Comparison of clinical and endoscopic characteristics of patients**

Parameter	EPS, n = 25	PDS, n = 40	EPS-PDS, n = 35	χ <sup>2</sup> value	P value
General lesions	18	27	25	14.58	0.003
Esophageal lesions	4	7	5	3.59	0.14
Peptic ulcer	3	5	4	8.61	0.02
Malignancy	0	1	1	2.11	0.36

The overall findings were observed in 70 out of 100 cases, representing a percentage of 70%. The study observed a prevalence of 48% for chronic superficial gastritis and 22% for chronic atrophic gastritis. The study revealed clinically significant endoscopic findings in 30 patients, accounting for 30% of the total sample. These findings encompassed esophageal lesions in 16 patients (16%), peptic ulcer in 12 patients (12%), and malignancy in 2 patients (2%). Among the cohort of 16 individuals with esophageal lesions, it was observed that 14 cases (14%) were diagnosed with reflux esophagitis. Specifically, 13 patients (13%) were classified as Los Angeles class A, while one case (1%) fell under Los Angeles classes B and C. Additionally, one patient (1%) was found to have Barrett's oesophagus. Within the cohort of individuals with peptic ulcers, it was observed that 5 cases (5%) presented with gastric ulcers, 5 cases (5%) exhibited duodenal ulcers, and 2 cases (2%) displayed compound ulcers. The malignancy group consisted of 2 cases (2%) of early gastroesophageal malignancy and 1 case (1%) of advanced gastric cancer.

**Table 4: Endoscopic findings in dyspepsia patients with no warning features**

Endoscopic diagnosis	Number	Percentage
General lesions	70	70
Chronic atrophic gastritis	22	22
Chronic superficial gastritis	48	48
Clinically significant findings	30	30
Esophageal lesions	16	16
Reflux esophagitis	14	17
Los Angeles class A	13	15
Los Angeles classes B and C	1	2
Barrett's esophagus	1	1
Other esophageal lesions	1	1
Peptic ulcer	12	12
Gastric ulcer	5	5
Duodenal ulcer	5	5
Compound ulcer	2	2
Malignancy	2	2
Gastric cancer	1	1
Esophageal cancer	1	1

Additional multivariable logistic regression analysis revealed that male gender, a body mass index (BMI) greater than 25, experiencing epigastric pain, and having a *Helicobacter pylori* (*H. pylori*) infection were identified as independent risk factors for the presence of chronic subdural fluid collections (CSFs). The odds ratios for these risk factors were 1.84, 1.94, 1.52, and 2.58, respectively, with corresponding 95% confidence intervals of 1.57-2.61, 1.31-2.44, 1.14-2.14, and 1.67-289. All of these associations were statistically significant with p-values less than 0.05. Based on the pathology reports of all patients, it was determined that the rate of *H. pylori* positivity was 26%. The peptic ulcer group exhibited a markedly higher rate of positivity (58%) compared to the other groups, with a statistically significant difference ( $P < 0.001$ ). Within the PDS group, a total of 25 patients (25%) exhibited positive endoscopic findings, a proportion that was found to be significantly lower compared to the other groups ( $P = 0.003$ ).

## DISCUSSION

Dyspepsia is a commonly observed clinical symptom, with a prevalence of approximately 2%-5% among primary care outpatient populations.<sup>[11,12]</sup> Nevertheless, there is still a lack of consensus regarding the optimal initial management approach for these individuals, particularly for those who do not exhibit any warning signs. In order to assess the potential inclusion of endoscopy in the initial treatment approach for dyspeptic patients in China, an analysis was conducted on the rates of identifying significant endoscopic findings in dyspeptic patients who exhibited no warning symptoms. The primary emphasis of this investigation was placed on determining the prevalence of malignancy. Subsequently, an examination was conducted to explore the correlation between upper gastrointestinal (GI) symptoms and CSFs in order to identify the subgroup of dyspeptic patients at a heightened risk, where the likelihood of obtaining a positive diagnostic outcome through endoscopy would be elevated. The study encompassed a sample size of 100 cases, consisting of 38 (38%) males and 62 (62%) females. In a study conducted by Gado A et al., it was observed that the incidence rate was 51% in males and 49% in females.<sup>[6]</sup> Thomson et al. reported an equal male to female ratio of 1:1.<sup>[13]</sup> In a study conducted in India, Sumathi B et al. observed a male to female ratio of 1.5:1. Similarly, Sunil Kumar et al. reported a ratio of 1.05:1.<sup>[14,15]</sup> The prevalent grievances reported in this investigation encompassed abdominal pain, bloating, and belching. Nevertheless, in cases where dyspeptic patients did not exhibit any prodromal symptoms, the occurrence rate of overall lesions in this particular investigation was approximately 70%.

This finding aligns with the outcomes of previous studies of a similar nature.<sup>[16]</sup> Furthermore, a meta-analysis has provided evidence indicating that warning symptoms exhibit a limited positive predictive value in the context of malignancy.<sup>[17]</sup> Hence, given the constrained predictive capacity of CSFs, it is advisable to not accord significant importance to warning symptoms in the context of making clinical decisions pertaining to endoscopy. In our research, the most prevalent CSFs were found to be esophageal lesions, accounting for 16% of cases, followed by PUD at 12%. Interestingly, despite the lack of reported complaints regarding reflux or heartburn among the majority of individuals with esophageal disease, the occurrence of reflux esophagitis reached a notable prevalence rate of 14%. Nevertheless, the majority of these patients exhibited esophagitis classified as Los Angeles class A. In the patient population with PUD, the observed prevalence rate of *Helicobacter pylori* infection was found to be 58%, whereas in the overall patient population, the prevalence rate was 26%. According to the guidelines followed in Western countries, a noninvasive approach may be recommended as the initial management strategy if physicians are able to effectively treat PUD and erosive esophagitis, and if the occurrence of malignancy is relatively uncommon. Consequently, endoscopy may not be deemed necessary in such cases. Nevertheless, the current study reported a malignancy prevalence rate of 2%, indicating that roughly 1 out of every 100 dyspeptic patients exhibited signs of cancer. It is important to note that without the implementation of endoscopy, the timely diagnosis of these cases would be significantly hindered. Furthermore, a significant proportion of dyspepsia patients who underwent endoscopy and were subsequently diagnosed with cancer were found to be in the initial stages of the disease. This underscores the crucial role of endoscopy in the early detection of such lesions. The primary symptoms observed in the study population included epigastric pain, which was reported by 58 individuals (58%); epigastric burning, reported by 35 individuals (35%); bloating, reported by 67 individuals (67%); belching, reported by 44 individuals (44%); early satiety, reported by 22 individuals (22%); and nausea, reported by 23 individuals (23%). Furthermore, the occurrence of bloating was frequently observed in the aforementioned patients. Within the subgroups of dyspeptic patients diagnosed with EPS and PDS, the endoscopic findings did not exhibit any statistically significant differences between these two syndromes, with the exception of a higher prevalence of peptic ulcers observed in patients with EPS. According to a study, the predictive accuracy of symptoms in determining the diagnosis of FD was found to be merely 17%.<sup>[18]</sup> Thomson et al.<sup>[19]</sup> also noted that the predominant symptom did not demonstrate predictive value for endoscopic

findings. Furthermore, a study conducted in China demonstrated that warning symptoms exhibited limited predictive efficacy for organic dyspepsia and organic upper gastrointestinal diseases.<sup>[20]</sup> In summary, the symptoms associated with dyspepsia have limited utility in the evaluation of this condition. An additional aim of our research was to investigate the risk factors linked to CSFs. Multivariate analysis was employed to determine the predictors of CSFs, and it was found that male gender and *H. pylori* infection exhibited statistical significance, consistent with findings from previous studies.<sup>[21,22]</sup> Moreover, previous research has demonstrated a positive correlation between elevated body mass index (BMI) levels (> 25) and the occurrence of reflux esophagitis.<sup>[23,24]</sup> and PUD. However, the precise underlying mechanism responsible for this robust association remains unclear.<sup>[25]</sup> This study demonstrated that a high body mass index (BMI) played a significant role in the prediction of CSFs. Epigastric pain was the sole symptom that exhibited a significant association with CSFs. The increased incidence of gastroesophageal injury in patients with epigastric pain may be primarily attributed to the elevated acid secretion observed in these individuals.<sup>[26]</sup> Furthermore, there was a gradual decline in the prevalence of peptic ulcers as individuals advanced in age. The potential cause of this phenomenon may be attributed to the influence of socioeconomic factors and work-related stress, both of which have been identified as established risk factors for the development of peptic ulcers. Numerous studies have demonstrated limited predictive capability of warning symptoms in relation to positive endoscopic findings. The researchers reached the conclusion that the decision to perform gastroscopy should not be solely reliant on the presence of warning symptoms. The present study is subject to several limitations. Initially, it is important to note that this study was conducted at a single centre, thereby limiting the generalizability of the findings. Furthermore, it is worth mentioning that not all participants included in the study were experiencing their first episode of dyspepsia. Furthermore, it is worth noting that the incorporation process and gastroscopic screening were primarily conducted by a limited number of physicians, which introduces the possibility of selection bias. Additionally, it should be noted that the sample size utilised in our study was insufficient to detect certain patterns that failed to attain statistical significance. Hence, it is imperative to conduct future extensive and well-designed studies incorporating a broader range of indicators in order to comprehensively evaluate the enduring advantages of gastroscopy. For instance, establishing an additional cohort comprising individuals exhibiting warning symptoms would enable a comparative analysis of the efficacy of gastroscopy in patients presenting with these two distinct forms of dyspepsia.

## CONCLUSION

The findings of our study revealed a notable prevalence of CSFs among dyspeptic patients who exhibited no premonitory symptoms, as per the Rome IV diagnostic criteria. Gastroscopy holds considerable implications in the evaluation of dyspeptic patients, particularly in individuals presenting with independent risk factors. Hence, it is not advisable to solely rely on warning symptoms as the basis for conducting gastroscopy.

## REFERENCES

1. Al-Abachi KT. Diagnostic value of endoscopy in adult patients with dyspepsia. *Prz Gastroenterol.* 2022;17(4):274-9. doi: 10.5114/pg.2021.112250. PMID 36514452, PMCID PMC9743333.
2. Sperber AD, Bangdiwala SI, Drossman DA, Ghoshal UC, Simren M, Tack J, et al. Worldwide prevalence and burden of functional gastrointestinal disorders, results of Rome Foundation global study. *Gastroenterology.* 2021;160(1):99-114.e3. doi: 10.1053/j.gastro.2020.04.014.
3. Thyagaraja K, Bhat VS, Benny S. Endoscopic findings in uninvestigated dyspepsia patients. *Int J Adv Med.* 2019;6(4):1051-3. doi: 10.18203/2349-3933.ijam20193254.
4. Mao LQ, Wang SS, Zhou YL, Chen L, Yu LM, Li M et al. Clinically significant endoscopic findings in patients of dyspepsia with no warning symptoms: A cross-sectional study. *World J Clin Cases.* 2021 May 26;9(15):3597-606. doi: 10.12998/wjcc.v9.i15.3597, PMID 34046459, PMCID PMC8130061.
5. Akhtar AJ, Shaheen MA. Dyspepsia in African and American and hispani patient. *J Natl Med Assoc.* 2004;96(5):635-40. PMID 15160978.
6. Gado A, Ebeid B, Abdelmohsen A, Axon A. Endoscopic evaluation of patients with dyspepsia in a secondary referral hospital in Egypt. *Alex J Med.* 2015;51(3):179-84. doi: 10.1016/j.ajme.2013.10.001.
7. Oh JH, Kwon JG, Jung HK, Tae CH, Song KH, Kang SJ, et al. Clinical practice guidelines for functional dyspepsia in Korea. *J Neurogastroenterol Motil.* 2020;26(1):29-50. doi: 10.5056/jnm19209, PMID 31917913.
8. Harer KN, Hasler WL. Functional dyspepsia: a review of the symptoms, evaluation, and treatment Options. *Gastroenterol Hepatol (N Y).* 2020;16(2):66-74. PMID 34035704.
9. Abdeljawad K, Wehbeh A, Qayed E. Low prevalence of clinically significant endoscopic findings in outpatients with dyspepsia. *Gastroenterol Res Pract.* 2017;2017:3543681. doi: 10.1155/2017/3543681, PMID 28210269.
10. Moayyedi P, Duffett S, Braunholtz D, Mason S, Richards ID, Dowell AC et al. The Leeds Dyspepsia Questionnaire: a valid tool for measuring the presence and severity of dyspepsia. *Aliment Pharmacol Ther.* 1998;12(12):1257-62. doi: 10.1046/j.1365-2036.1998.00404.x, PMID 9882035.
11. Okumura T, Tanno S, Ohhira M, Tanno S. Prevalence of functional dyspepsia in an outpatient clinic with primary care physicians in Japan. *J Gastroenterol.* 2010;45(2):187-94. doi: 10.1007/s00535-009-0168-x, PMID 19997854, Google Scholar.
12. van Bommel MJ, Numans ME, de Wit NJ, Stalman WA. Consultations and referrals for dyspepsia in general practice - a one year database survey. *Postgrad Med J.* 2001;77(910):514-8. doi: 10.1136/pmj.77.910.514, PMID 11470932.
13. Thomson ABR, 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. doi: 10.1046/j.1365-2036.2003.01646.x, PMID 12823150.

14. Sumathi B, Navaneethan U, Jayanti N. Appropriateness of indications for diagnostic upper GI endoscopy in India. *Singap J.* 2008;49(12):970-6.
15. Kumar Dr Sunil, Pandey Dr Hari Ignatius, Verma Dr Arunima, Deb Dr Partha Pratim. Prospective analysis of 500 cases of upper gi endoscopy at Tata Main Hospital. *IOSR JDMS (IOSR-JDMS).* 2014;13(January (1 Ver. III))21–25 eISSN: 2279-0853, p-ISSN: 2279-0861.
16. Mahadeva S, Goh KL. Clinically significant endoscopic findings in a multi-ethnic population with uninvestigated dyspepsia. *Dig Dis Sci.* 2012;57(12):3205-12. doi: 10.1007/s10620-012-2256-7, PMID 22688184, Google Scholar.
17. 14, Vakil N, Moayyedi P, Fennerty MB, Talley NJ. Limited value of alarm features in the diagnosis of upper gastrointestinal malignancy: systematic review and meta-analysis. *Gastroenterology.* 2006;131(2):390-401; quiz 659. doi: 10.1053/j.gastro.2006.04.029, PMID 16890592, Google Scholar.
18. Hammer J, Eslick GD, Howell SC, Altiparmak E, Talley NJ. Diagnostic yield of alarm features in irritable bowel syndrome and functional dyspepsia. *Gut.* 2004;53(5):666-72. (PMC Free article). doi: 10.1136/gut.2003.021857, PMID 15082584, Google Scholar.
19. 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. doi: 10.1046/j.1365-2036.2003.01646.x, PMID 12823150, Google Scholar.
20. Wei ZC, Yang Q, Yang Q, Tantai XX, Xing XX, Xiao CL et al. Predictive value of alarm symptoms in patients with Rome IV dyspepsia: A cross-sectional study. *World J Gastroenterol.* 2020;26(30):4523-36. (PMC Free article). doi: 10.3748/wjg.v26.i30.4523, PMID 32874062, Google Scholar.
21. Hu PJ, Li YY, Zhou MH, Chen MH, Du GG, Huang BJ et al. Helicobacter pylori associated with a high prevalence of duodenal ulcer disease and a low prevalence of gastric cancer in a developing nation. *Gut.* 1995;36(2):198-202. (PMC Free article). doi: 10.1136/gut.36.2.198, PMID 7883217, Google Scholar.
22. Wai CT, Yeoh KG, Ho KY, Kang JY, Lim SG. Diagnostic yield of upper endoscopy in Asian patients presenting with dyspepsia. *Gastrointest Endosc.* 2002;56(4):548-51. doi: 10.1067/mge.2002.128493, PMID 12297772, Google Scholar.
23. El-Serag HB, Ergun GA, Pandolfino J, Fitzgerald S, Tran T, Kramer JR. Obesity increases oesophageal acid exposure. *Gut.* 2007;56(6):749-55. (PMC Free article). doi: 10.1136/gut.2006.100263, PMID 17127706, Google Scholar.
24. Jacobson BC, Somers SC, Fuchs CS, Kelly CP, Camargo CA Jr. Body-mass index and symptoms of gastroesophageal reflux in women. *N Engl J Med.* 2006;354(22):2340-8. (PMC Free article). doi: 10.1056/NEJMoa054391, PMID 16738270, Google Scholar.
25. Wang FW, Tu MS, Mar GY, Chuang HY, Yu HC, Cheng LC et al. Prevalence and risk factors of asymptomatic peptic ulcer disease in Taiwan. *World J Gastroenterol.* 2011;17(9):1199-203. (PMC Free article). doi: 10.3748/wjg.v17.i9.1199, PMID 21448426, Google Scholar.
26. McColl KE, Fullarton GM. Duodenal ulcer pain--the role of acid and inflammation. *Gut.* 1993;34(10):1300-2. (PMC Free article). doi: 10.1136/gut.34.10.1300, PMID 8244091, Google Scholar.