Original Article

The Spectrum of Upper Gastrointestinal Endoscopic Findings and Therapeutic Interventions in Patients Presenting with Upper Gastrointestinal Complaints: A Tertiary Care Study

Mohammed Shin[1], Rohith George[1], Santosh R. Goudar[1], Sydney D'Souza[1], Ibrahim Masoodi[1,2]

[1]Department of Medicine, Yenepoya Medical College, Yenepoya University, Mangalore, Karnataka, India, [2]Department of Gastroenterology, Eastbourne Hospital, East Sussex NHS Trust UK, East Sussex, UK

Abstract

Background: Endoscopy has a great role in the diagnosis, surveillance, and management of various gastrointestinal (GI) ailments. **Aims:** This study aimed to evaluate the spectrum of upper GI (UGI) symptoms and correlate them with the findings on UGI endoscopic examination. **Patients and Methods:** This observational cross-sectional study was carried out from August 2019 to December 2020 in the adult patients presenting with UGI complaints. The patients underwent UGI endoscopy at Yenepoya Medical College Hospital, Mangalore, a tertiary care centre in southern Indian state of Karnataka. Endoscopies were performed as per the standard protocol with diagnosis based on accepted criteria. **Results:** A total of 450 subjects (mean age: 49.14 ± 13.9; range, 19–89; 322 [71.5%] men) were included. Among the diagnostic indications, dyspeptic symptom seen in 176 (39.1%) patients was the most frequent indication in this study cohort, followed by reflux in 73 (16.2%) patients, UGI bleeding in 69 (15.34%) patients (portal hypertensive bleeding was found to be more common than nonvariceal bleed (49:20). Antral gastritis was seen in 112 (24.9%) patients. Ninety (20%) patients were found to have esophageal varices and 47 (10.4%) had esophagitis. Biopsy showed 25.3% to be positive for *Helicobacter pylori*. Forty-seven (10.45%) patients with a mean age 32 ± 6.8 years with dyspeptic symptoms but no alarming symptoms had normal endoscopic examination. **Conclusion:** Antral gastritis was the most common endoscopic finding in patients with dyspeptic symptoms. Portal hypertension was a more common cause of UGI bleeding compared to duodenal ulcers. While the majority of the patients presenting with heartburn had esophagitis, nonerosive esophagitis was observed in 3.2% of patients.

Keywords: Carcinoma stomach, dyspepsia, melena, portal hypertension

Introduction

Upper gastrointestinal (UGI) endoscopy is one of the important outpatient procedures for the evaluation and management of various gastrointestinal (GI) disorders. While an empiric trial of proton-pump inhibitors (PPI) may be suitable for the young patients with dyspeptic symptoms, it is always prudent to evaluate elderly and all patients with alarm symptoms such as dysphagia, weight loss, and persistent reflux symptoms. Furthermore, patients presenting with melena or haematemesis should be evaluated soon after resuscitation as endoscopy offers therapeutic modalities ranging from injection sclerotherapy (both in variceal and nonvariceal bleeding) to clip deployment in patients with nonvariceal bleed and endoscopic variceal ligation (EVL) in patients with variceal bleed. Endoscopy has helped bring down mortality and morbidity over the past decades in patients with GI bleed.[1] UGI endoscopy data on 1108 study subjects from China suggested that various GI pathologies due to *Helicobacter pylori* get unraveled by an endoscopic examination as most of the patients harboring this infection remain asymptomatic. Their study highlights

Access this article online

Quick Response Code:

Website: www.njmonline.org

DOI: 10.4103/NJM.NJM_55_22

Address for correspondence: Dr. Ibrahim Masoodi, Department of Medicine, Yenepoya Medical College, Mangalore - 575 018, Karnataka, India. Department of Gastroenterology, Eastbourne Hospital, East Sussex NHS Trust UK, East Sussex, UK.
E-mail: ibrahimmasoodi@yahoo.co.in

How to cite this article: Shin M, George R, Goudar SR, D'Souza S, Masoodi I. The spectrum of upper gastrointestinal endoscopic findings and therapeutic interventions in patients presenting with upper gastrointestinal complaints: A tertiary care study. Niger J Med 2022;31:396-400.

Submitted: 28-Apr-2022 **Revised:** 19-May-2022
Accepted: 31-May-2022 **Published:** 27-Aug-2022

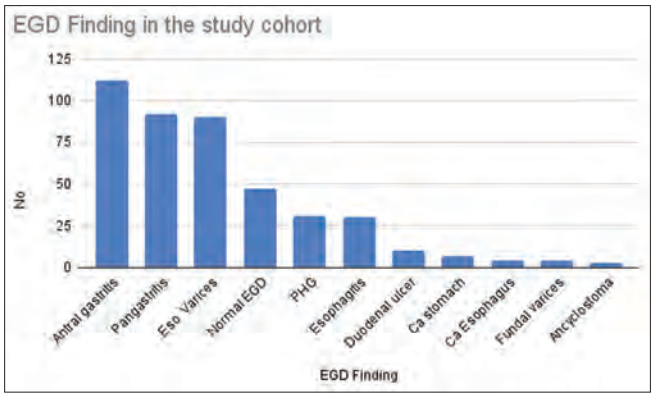

Figure 1: UGI endoscopy findings in the study cohort. UGI: Upper gastrointestinal, EGD: Esophagogastroduodenoscopy

that endoscopic examination could help eradication of *H. pylori* and thus circumvent long-term complications of this Type 1 carcinogen.[2] The patients younger than 50 years with dyspeptic symptoms without alarm symptoms may be empirically treated with *H. pylori* regimens; nevertheless, if symptoms persist after such treatment, an UGI endoscopy must be planned.[3]

The patients with compensated cirrhosis benefit from universal screening endoscopy as beta-blockers are started on the detection of large varices and even EVL is done as a primary prophylaxis for variceal bleeding, which continues to have high mortality.[4] Further, endoscopy has played a major role in the evaluation of ascites. By detecting esophageal varices or portal hypertensive gastropathy, ascites is attributed to portal hypertension.

There are limited data on the relationship of UGI symptoms and endoscopic findings in this region. Thus, we were prompted to undertake this cross-sectional study at our institution after proper scientific board approval and ethical clearance.

Patients and Methods

Study design

This was an observational cross-sectional study from August 1, 2019, to December 30, 2020, at Yenepoya Medical College, a tertiary care centre in the southern Indian state of Karnataka. The demographic data and indications were entered via an online pro forma and well-informed consent was taken from the study participants. Endoscopies were performed as per the standard protocol with diagnosis based on accepted criteria. The patients underwent either rapid urease test or biopsy to rule out *H. pylori* infection and therapeutic interventions when indicated.

Due to the few number of endoscopes and limited sterilization facilities, we screened all patients for hepatitis B virus (HBV), hepatitis C virus (HCV), and HIV before undergoing endoscopic procedures. Positive serology patients were endoscoped on a single day and endoscopes were sterilized as per the standard protocols in an attempt to prevent transmission of infection.

Data were collected from the medical gastroenterology and from the Medical Records Department of the hospital.

Sampling size

Considering 5% level of significance and study precision at 5%, the estimated sample size, $n = 450$.

Inclusion criteria

Patients with UGI symptoms undergoing UGI endoscopy during the study period were included in the study.

Exclusion criteria

1. Patients not willing to be part of the study were excluded
2. Patients with hypotension, shock, or low oxygen saturation on room air were excluded as they were unfit for the procedure.

Statistical analysis

The data were entered into Microsoft Excel. Simple descriptive statistics with appropriate method of presentation was used to describe the data. Association between the spectrum of findings on GI endoscopy with dyspeptic symptoms was calculated. The data were tested at 5% level of significance and at 80% power of the test. (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp).

Results

Of the 450 patients, there were 322 (71.55%) males. The mean age of the study participants was 49.14 ± 13.9 (range, 19–89 years). Of the 450 patients, 28 procedures were done as emergency procedures to control UGI bleeding and the rest of the procedures were completed electively. As shown in Table 1, majority of the referrals were for the evaluation of dyspeptic symptoms, UGI bleeding, and reflux symptoms, followed by other symptoms.

Comorbidities present in the study cohort: Alcoholic liver disease was the most frequent comorbidity found in 135 (30%), diabetes mellitus in 70 (15.55%), hypertension in 14 (3.11%), and chronic kidney disease (CKD) in 13 (2.88%). Among diabetic patients, the most common referrals were for the evaluation of dyspepsia, followed by reflux symptoms as shown in Table 2.

Viral serology

It was observed that majority of the patients had negative serology 396 (88%). HBV was positive in 25 (5.55%), HCV in 13 (2.88%), and HIV in 6 (1.33%) of the subjects who underwent UGI procedure in this study cohort.

Presenting symptoms

Dyspepsia

176 (39.1%) patients were referred for UGI endoscopy for the evaluation of dyspeptic symptoms. It was observed that majority had antral gastritis as shown in [Figure 1]. *H. pylori*

was found to be positive based on rapid urease test or histology in 114 (31.84%) of the 358 patients who were tested. Nonulcer dyspepsia was the most frequent cause of dyspepsia.

Reflux symptoms

The next common symptom in our study was heartburn as shown in Table 1. Features of esophagitis LA Class A were found in 53 (72.6%), LA Class B in 10 (13.69%), and LA Class C in 5 (6.8%). Normal esophagus was seen in 5 (3.2%) accounting for nonerosive esophagitis.

Upper gastrointestinal bleeding

It presented as haematemesis in 29 (42.02%) and melena in 40 (57.97%). Our data revealed that varices were identified in 20 (28.98%) cases and EVL was done when there was red color sign or varices were more than Grade 2. Portal hypertensive gastropathy was observed in 31 (44.92%) cirrhotic patients.

Duodenal ulcers were seen in 10 (14.49%) patients. Endotherapy was done using injection of adrenaline 1:10,000 around the ulcer and haemostatic clips were used to control UGI bleed in patients with signs of recent haemorrhage (SRH). The patients were given *H. pylori* treatment after discharge.

Table 1: Demographic data of the study cohort

	n (%)
Males	322 (71.5)
Mean age	49.14±13.9
Age range (years)	19-89
Emergency endoscopy procedure to control bleed	28
Clinical indications	
Dyspepsia	176 (39.1)
Reflux symptoms	79 (16.2)
Upper GI bleeding	69 (15.3)
Anaemia	58 (12.9)
Vomiting	24 (5.3)
Dysphagia	23 (5.1)
Weight loss	21 (4.7)
HBV positive	25 (5.55)
HCV positive	13 (2.88)
HIV positive	6 (1.33)
Mean haemoglobin (g/dl)	10.2±2.64
Mean platelet count	90.37±13.04

GI: Gastrointestinal, HBV: Hepatitis B virus, HCV: Hepatitis C virus

Extrahepatic portal hypertension with haematemesis was observed in 4 (5.79%) patients and was managed by injection of cyanoacrylate in their fundal varices.

Anaemia

Fifty-eight patients were referred for the evaluation of anaemia. Carcinoma of the stomach was found in 7 (12%) patients who presented with anaemia and weight loss. There were 16 (27.58%) patients with chronic renal failure and had endoscopic features of uraemic gastritis and duodenal ulcers on UGI endoscopy. Anaemia could be attributed to CKD in those patients. Atrophic gastritis was observed in 6 (10.34%) patients.

Vomiting

Twenty-four (5.33%) patients were referred for the evaluation of vomiting. Features of bile reflux were seen in 7 (29.16%) patients and their vomiting responded well to the treatment. There were antral erosions in 14 (58%) and pyloric channel ulcers in 3 (12%) patients. *H. pylori* eradication therapy was given when the urea breath test was positive.

Dysphagia

Twenty-three patients underwent UGI endoscopy for the evaluation of dysphagia. Carcinoma of the esophagus was found in 4 (17.39%) patients. Esophageal candidiasis was observed in 8 (34.79%) patients without comorbidities and in three patients with HIV. Two young patients with dysphagia proved to have achalasia cardia on barium swallow. No esophageal lesion was seen in six patients, and dysphagia could be attributed to Globus hystericus.

Weight loss as a symptom was found in 21 (4.67%) referrals and carcinoma stomach was found to be in association with anaemia in 7 (33.34%) patients.

Discussion

Majority of the referrals for an UGI endoscopy procedure were for the evaluation of dyspeptic symptoms in this study. While endoscopic findings were suggestive of antral gastritis in the majority of the patients, duodenal ulcers were noted as well. Association between dyspepsia and *H. pylori* is well known,[5] and in this study, patients who were either urease test positive or histology positive for *H. pylori* were given triple therapy for their dyspeptic symptoms. Nevertheless,

Table 2: Comorbidities in patients presenting with the upper gastrointestinal symptoms

Indications	Total (*n*=450)	Diabetes mellitus (*n*=70)	CLD (*n*=112)	CKD (*n*=16)	Hypertension (*n*=20)
Dyspepsia	176	22	55	5	10
Reflux symptoms	79	15	7	4	3
GI bleeding	69	9	39	4	3
Anaemia	58	12	3	0	0
Vomiting	24	6	3	3	1
Dysphagia	23	2	1	0	1
Weight loss	21	4	4	0	2
Total	450	70	112	16	20

GI: Gastrointestinal, CKD: Chronic kidney disease, CLD: Chronic liver disease

nonulcer dyspepsia contributed an important cause of pain abdomen where endoscopy did not reveal any major finding. These results are in cognisance with the findings of other workers.[6,7] Unfortunately, PPIs are self-prescribed and used indiscriminately[8] for a long time without a prescription. Their use should be restricted to prevent many complications including gastric polyposis[9] on prolonged usage.

Evaluation of reflux symptoms was the next common indication of UGI endoscopy in this study. Our study showed that diabetes outnumbered chronic liver disease, CKD, and hypertension as comorbidity associated with reflux in these patients. In a meta-analysis by Sun *et al*.,[10] it was shown that patients with diabetics are more prone to reflux disease than those without diabetes mellitus. There are multiple mechanisms which explain why diabetics are more prone to reflux. The most important reason being a higher body mass index in Type 2 diabetics and subsequent reflux as shown by other workers.[11,12] Furthermore, in advanced diabetes, autonomic neuropathy may be the contributing factor. Studies have shown that esophageal transit time is delayed in 35% of diabetic patients contributing to increased frequency of gastroesophageal reflux disease in this patient population.[13]

Normal esophageal mucosa in patients with heartburn could reflect the presence of nonerosive esophagitis as an important cause of the heartburn. Trimble *et al*.[14] concluded in their study that there is an increased mucosal sensitivity to acid causing heartburn and enhanced sensory perception of physiological reflux. Visceral hyperalgesia could be another contributing factor. Hiatal hernia was seen in 11 (13.92%) patients presenting with reflux, and the size of the hernia has been shown to correlate with the severity of reflux.[15] Our results are in line with the findings of other workers.[16,17]

GI bleeding continues to be an important GI emergency. Duodenal ulcers were less frequent in this study and patients with signs of recent haemorrhage, (Ooze, clot ,visible vessel, sputter) were given endotherapy in combination with PPI therapy. PPI therapy in combination with injection sclerotherapy in UGI bleeding is known to decrease rebleeding, hospital stay, and surgery in patients with nonvariceal bleeds.[18] In this study, variceal bleeds outnumbered nonvariceal bleeds. There is a changing trend in the aetiology of GI bleeds since the advent of PPIs and now nonvariceal bleeds are declining world over as shown by other workers across the globe.[19,20] Portal hypertension as a cause of haematemesis or melena continues to be on the rise due to chronic alcoholism and is expected to continue being on the rise due to the increasing prevalence of nonalcoholic steatohepatitis. There were four patients who presented with well-tolerated haematemesis (with no hepatic encephalopathy) and had features of extrahepatic portal vein obstruction on ultrasound. All four were females and had fundal varices (IGF3). Injection cyanoacrylate was injected and bleeding controlled without any complication. Endoscopic sclerotherapy using glue has been considered to be effective for fundal varices; however, patients need to be kept on surveillance.[21]

In this study, alcoholic liver disease presenting as variceal bleed was more frequent than other causes of chronic liver disease. In a study by Sivapuram *et al*.,[22] it was estimated that in the state of Karnataka, weighted percentage of alcohol abuse was 16.59%, which was higher than other states of India. Other causes of portal hypertension included HBV and HCV, but this study does not reflect the total burden of chronic HBV and HCV in this part of the country as there are multiple centres catering to acute GI bleeding in this region. India is estimated to have 37 million HBV carriers[23] and portal hypertension with its complications is deemed to increase in the future highlighting the need for urgent public health interventions to curb HBV and its complications. Chronic HCV is another important cause of portal hypertension in India. It has been estimated that the prevalence of HCV is 1% and is known to occur through transfusion and the use of unsterile glass syringes.[24]

Fifty-eight (12.9%) cases were endoscoped for the evaluation of anaemia; iron deficiency anaemia needs gut evaluation. We observed carcinoma of the stomach in 7 (1.6%) cases. Five patients were managed as tropical sprue and they improved after treatment. Tropical sprue is known to occur in an endemic and epidemic form in southern India and is a consequence of enterocyte damage followed by malabsorption.[25] Another contributor of anaemia found in this study was *Ancylostoma duodenale*, which was found in three patients in the second part of the duodenum possibly due to migration to the upper gut following fasting for the procedure. Parasite infestations continue to be an important cause of anaemia in the subcontinent with one South Indian study quoting various parasites to be the cause of anaemia to the tune of 20% among school-going children.[26] Various predictors of parasitosis found in another study have identified poor water resources and sanitation conditions to be responsible for intestinal parasitosis.[27] Hookworm infestation affects millions across the globe and causes significant anaemia; poor sanitation in addition to walking bare feet is the contributing factor. Our data do not reflect the actual burden of this disease.

Atrophic gastritis was seen in 6 (10.79%) patients and they were given parenteral B12 therapy and *H. pylori* treatment. The actual prevalence of atrophic gastritis is unknown. It presents with vague symptoms and endoscopy helps in ruling out other causes (malignancy, erosions and haemorrhagic gastritis).Further when positive (Urease test or biopsy) in eradication of *H. pylori*.[28] The drawback of this study is that we did not analyze lower GI causes in the diagnosis of iron-deficiency anaemia.

Intractable vomiting was another indication for UGI endoscopy. Diabetes mellitus was the most common comorbidity associated with this symptom, and endoscopy findings included antral erosions, lesser curvature ulcers, and presence of *H. pylori* as demonstrated by biopsy and urea breath test . Bile reflux causing recurrent vomiting was observed in 6 (25%) patients. Our results are consonance with the findings of other workers.[29,30]

There were 23 (5.12%) referrals for the evaluation of dysphagia and carcinoma esophagus was observed in four patients and all patients had mid-esophageal lesions. Squamous cell carcinoma trends higher in India as demonstrated by Cherian *et al*.[31] It is prudent to have an UGI examination in a patient with dysphagia, and when endoscopy is noncontributory, barium swallow and manometry should be done to diagnose achalasia cardia. We demonstrated achalasia cardia in two young patients with normal endoscopy in this study.

Twenty-one patients had endoscopy for weight loss and it was observed that carcinoma stomach giving rise to weight loss was observed in 7 (33.34%) patients. All of them had an advanced disease. Studies have shown when alarm symptoms (weight loss, melena, and anorexia) are present like those in the index cases the disease is invariably advanced[32] warranting early endoscopic screening in susceptible population.

Conclusion

In the present study, dyspeptic patients had antral gastritis and pangastritis on endoscopic examination. *H. pylori* infection presenting as dyspepsia was frequent; further studies will be required to ascertain the association. Variceal bleeding was more common than nonvariceal bleeding in patients presenting with UGI bleeding, which is in accordance with the global trend.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. **Cooper** GS. Indications and contraindications for upper gastrointestinal endoscopy. Gastrointest Endosc Clin N Am 1994;4:439-54.
2. Huang Y, Li H, Long X, Liang X, Lu H. Lessons learned from upper gastrointestinal endoscopy in asymptomatic Chinese. Helicobacter 2021;26:e12803.
3. Konturek PC, Brzozowski T, Konturek SJ. Stress and the gut: Pathophysiology, clinical consequences, diagnostic approach and treatment options. J Physiol Pharmacol 2011;62:591-9.
4. Spiegel BM, Targownik L, Dulai GS, Karsan HA, Gralnek IM. Endoscopic screening for esophageal varices in cirrhosis: Is it ever cost effective? Hepatology 2003;37:366-77.
5. Huang JQ, Hunt RH. Eradication of *Helicobacter pylori* infection in the management of patients with dyspepsia and non-ulcer dyspepsia. Yale J Biol Med 1998;71:125-33.
6. Tachi K, Nkrumah KN. Appropriateness and diagnostic yield of referrals for oesophagogastroduodenoscopy at the Korle Bu Teaching Hospital. West Afr J Med 2011;30:158-63.
7. Masoodi I. The prevalence and risk factors of non-ulcer dyspepsia in the western region of Saudi Arabia: Short form Leads dyspepsia questionnaire revisited Int J Med Sci Public Health 2018;7:915-21.
8. Masoodi I. Prescription pattern of proton pump inhibitors among adults: A drug utilization study in the western region of Saudi Arabia. Int J Med Dev Ctries 2019;3:699-704.
9. Alqutub AN, Masoodi I. A case of gastric polyposis in antral area of stomach following prolonged proton-pump therapy. Ger Med Sci 2010;8:Doc19.
10. Sun XM, Tan JC, Zhu Y, Lin L. Association between diabetes mellitus and gastroesophageal reflux disease: A meta-analysis. World J Gastroenterol 2015;21:3085-92.
11. Richter JE, Rubenstein JH. Presentation and epidemiology of gastroesophageal reflux disease. Gastroenterology 2018;154:267-76.
12. Voutilainen M, Sipponen P, Mecklin JP, Juhola M, Färkkilä M. Gastroesophageal reflux disease: Prevalence, clinical, endoscopic and histopathological findings in 1,128 consecutive patients referred for endoscopy due to dyspeptic and reflux symptoms. Digestion 2000;61:6-13.
13. Kong MF, Horowitz M, Jones KL, Wishart JM, Harding PE. Natural history of diabetic gastroparesis. Diabetes Care 1999;22:503-7.
14. Trimble KC, Douglas S, Pryde A, Heading RC. Clinical characteristics and natural history of symptomatic but not excess gastroesophageal reflux. Dig Dis Sci 1995;40:1098-104.
15. Jones MP, Sloan SS, Rabine JC, Ebert CC, Huang CF, Kahrilas PJ. Hiatal hernia size is the dominant determinant of esophagitis presence and severity in gastroesophageal reflux disease. Am J Gastroenterol 2001;96:1711-7.
16. Ford AC, Marwaha A, Lim A, Moayyedi P. What is the prevalence of clinically significant endoscopic findings in subjects with dyspepsia? Systematic review and meta-analysis. Clin Gastroenterol Hepatol 2010;8:830-7, 837.e1-2.
17. Ayuo PO, Some FF, Kiplagat J. Upper gastrointestinal endoscopy findings in patients referred with upper gastrointestinal symptoms in Eldoret, Kenya: A retrospective review. East Afr Med J 2014;91:267-73.
18. Javid G, Masoodi I, Zargar SA, Khan BA, Yatoo GN, Shah AH, *et al.* Omeprazole as adjuvant therapy to endoscopic combination injection sclerotherapy for treating bleeding peptic ulcer. Am J Med 2001;111:280-4.
19. Loperfido S, Baldo V, Piovesana E, Bellina L, Rossi K, Groppo M, *et al.* Changing trends in acute upper-GI bleeding: A population-based study. Gastrointest Endosc 2009;70:212-24.
20. Masoodi I, AlQurashi H, Al Sofiyani M. Changing trends in acute upper GI bleeding a single centre study in the western region of Saudi Arabia. Br J Med Pract 2019;12:a019.
21. Chandra S, Holm A, El Abiad RG, Gerke H. Endoscopic cyanoacrylate glue injection in management of gastric variceal bleeding: US tertiary care centre experience. J Clin Exp Hepatol 2018;8:181-7.
22. Sivapuram MS, Nagarathna R, Anand A, Patil S, Singh A, Nagendra HR. Prevalence of alcohol and tobacco use in India and implications for COVID-19 – Niyantrita Madhumeha Bharata study projections. J Med Life 2020;13:499-509.
23. Puri P. Tackling the Hepatitis B disease burden in India. J Clin Exp Hepatol 2014;4:312-9.
24. Acharya SK, Madan K, Dattagupta S, Panda SK. Viral hepatitis in India. Natl Med J India 2006;19:203-17.
25. Mathan VI. Tropical sprue in southern India. Trans R Soc Trop Med Hyg 1988;82:10-4.
26. Gopalakrishnan S, Eashwar VM, Muthulakshmi M, Geetha A. Intestinal parasitic infestations and anaemia among urban female school children in Kancheepuram district, Tamil Nadu. J Family Med Prim Care 2018;7:1395-400.
27. Singh C, Zargar SA, Masoodi I, Shoukat A, Ahmad B. Predictors of intestinal parasitosis in school children of Kashmir: A prospective study. Trop Gastroenterol 2010;31:105-7.
28. Rodriguez-Castro KI, Franceschi M, Noto A, Miraglia C, Nouvenne A, Leandro G, *et al.* Clinical manifestations of chronic atrophic gastritis. Acta Biomed 2018;89:88-92.
29. Gyedu A, Yorke J. Upper gastrointestinal endoscopy in the patient population of Kumasi, Ghana: Indications and findings. Pan Afr Med J 2014;18:327.
30. Agyei-Nkansah A, Duah A, Alfonso M. Indications and findings of upper gastrointestinal endoscopy in patients presenting to a District Hospital, Ghana. Pan Afr Med J 2019;34:82.
31. Cherian JV, Sivaraman R, Muthusamy AK, Jayanthi V. Carcinoma of the esophagus in Tamil Nadu (South India): 16-year trends from a tertiary centre. J Gastrointestin Liver Dis 2007;16:245-9.
32. Maconi G, Manes G, Porro GB. Role of symptoms in diagnosis and outcome of gastric cancer. World J Gastroenterol 2008;14:1149-55.