

RESEARCH ARTICLE

Epidemic Trends of Upper Gastrointestinal Tract Abnormalities: Hospital-based study on Endoscopic Data Evaluation

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Abstract

Purpose: To understand the epidemiology of different upper gastrointestinal (UGI) tract related abnormalities through endoscopic data analysis. **Materials and Methods:** A retrospective study of three years from January 2009 to December 2011 was conducted with data from endoscopic surveillance of upper GI tract problems, collected from the Gastroenterology Unit, Osmania General Hospital, Hyderabad. MS excel and Medcalc software (comparison of proportions) were used for data analysis. **Results:** A total of 10,029 (6,468 in males and 3,561 in females) endoscopies were performed during this three-year period. The male to female ratio was 1.8:1. Overall, ~30% of endoscopies evaluated showed patients with acid peptic disorders, 13.6% with vascular-related abnormalities, 10.6% showed structural abnormalities, followed by 6.3% with malignancies. Burden of malignancies was mostly observed in the older age group (60-69 years). Esophageal cancer cases decreased ($p=0.0001$) whereas stomach cancers increased over this period ($p=0.0345$). We also observed an increased incidence of acid peptic disease (APD) ($p=0.0036$) and gastroesophageal reflux disease (GERD) ($p=0.0002$) cases during this period. **Conclusions:** Endoscopic diagnosis is useful for early detection of UGI anomalies and helpful for physicians to manage and treat varied kinds of UGI disorders. Analysis of data revealed changing trends in the incidence of various pathologies of the UGI tract. Functional dyspepsia and GERD definitely reduce the quality of life of the individual. The role of our diverse dietary habits and lifestyle associated with these problems have not yet been established, though there have been reports on the effect of coffee, spicy food, wheat-based diet. Screening of UGI pathologies along with collection of complete personal and medical history details, can help in correlating the patients' condition with various aspects of lifestyle and diet.

Keywords: Upper gastrointestinal tract - endoscopy - epidemiology - cancer

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Introduction

India is a developing country with one of the most diverse populations and diets in the world. Gastrointestinal (GI) tract related abnormalities in India are rising (increasingly being reported) with increasing migration of rural population to the cities and a change in life style. Upper gastrointestinal tract abnormalities are quite often linked to infection and inflammation. This present study will elucidate the incidence rate of different gastrointestinal abnormalities from a hospital-based study to understand the epidemiology and etiology. The common indications for endoscopy are dysphagia, dyspepsia, persistent heartburn suggesting gastroesophageal reflux disease (GERD), persistent nausea and vomiting, upper GI bleeding/anemia, non-responsiveness of symptoms to H2 antagonists and proton pump inhibitors, atypical chest pain, significant weight loss and screening of known Barrett's esophagus or lesions (John, Mark 1991; Axon et

al., 1995; Khoshbaten et al., 2010).

Dysphagia is a common symptom of esophageal disorders which may be due multitude of underlying causes. Patients may present with difficulty in swallowing of solids, liquids or both; usually disorders causing luminal narrowing and impaired peristalsis cause this condition. Structural lesions of the esophagus like web, ring and strictures produce an intermittent obstruction giving rise to intermittent dysphagia (David et al., 2000; Edgarachkar 2005).

Mucosal injury is defined as damage from intrinsic or extrinsic agents capable of disrupting the integrity of the mucosa leading to acute or chronic inflammation, causing scarring. Most common mucosal injuries are acid reflux disease (GERD), infectious esophagitis, radiation esophagitis, esophagitis due to caustic ingestion or due to excess/inaccurate use of medication (Messner et al., 1996; Andreollo et al., 2003; Tseng et al., 2004). In general, candidal infections are common, especially in patients

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with immunocompromised status. Some patients with UGI disorders showed parasitic infestation like hook worms. Acid peptic diseases (ulcers, erosions) are common these days, both in developed and developing countries (Pahwa et al., 2010). In India, due to rapid urbanization or migration of rural population to cities leading to an inevitable change in lifestyle and food habits (Moore et al., 2003; Ibrahim et al., 2013), in addition, the excess use of medications for common ailments, might be the reason for excessive gastric acid/pepsin secretion, thus producing acid-alkali disturbances. This weakens the mucosal defense in the upper GI tract, leading to damage to the lining of the esophagus, stomach and duodenum, giving rise to ulceration, GERD, erosive esophagitis and erosive gastritis (Kurata et al., 1997; <http://www.medindia.net/patients/patientinfo/acid-peptic-disease/>).

Vascular disorders result from portal hypertension (PHTN) that is due to increased blood pressure within a system of veins called the portal venous system. The vessels in the liver get blocked due to damage (cirrhosis due to alcohol, hepatitis infection, blood clots in the portal vein, parasitic infection schistosomiasis), leading to high pressure in the portal system and the development of large, swollen veins (varices) within the esophagus, stomach, rectum, or umbilical area (belly button). Varices can rupture and bleed, resulting in potentially life-threatening complications. Apart from these benign conditions, esophageal endoscopies also reveal frank UGI malignancies relating to the oral cavity, esophagus and stomach.

The food ingested and passed through the GI tract contains nutrients as well as toxins. Further, the surface of the GI tract has a complex system of nerves and other cells of the immune system. They form part of a complex sensing system called the mucosa-associated lymphatic tissue (MALT). Any kind of physical or physiological damage to the GI tract can affect the ability to sense and discard toxins exposed to the GI tract, thus leading to cell and DNA damage. This must be a feature of all chronic conditions including those which lead to malignancy in the GI tract.

The frequency of these conditions in our population has been evaluated in this study of three consecutive years including cases referred to the GI unit for endoscopic evaluation. The study has been conducted to appreciate the changing scenario in terms of occurrence of these disorders with respect to both the sexes and understand the possible factors that could be related to an increase or decrease of the number of cases reported with these conditions over this three-year period.

Materials and Methods

A retrospective study of three years from January 2009 to December 2011 (2009, 2010, 2011) was conducted. Data was collected from Department of Gastroenterology Unit, Osmania General Hospital, Hyderabad. The subjects in the present study group include cases with various complaints related to the upper GI tract and were referred for endoscopic evaluation from different departments in the same hospital or from different urban

and rural area hospitals of the state. A total of 10,029 subjects who presented with GI disorders were evaluated endoscopically. The upper GI problems are classified based on endoscopic evaluation results (Figure 1). The data was analyzed comparing the information obtained for three years to check the incidence rates of different pathologies in the period studied. The outcome may help in understanding the burden of different upper GI abnormalities and their changing trends in our population and be useful for designing proper screening and management programs for specific UGI abnormalities in our population. Statistical tests using Medcalc, Excel was used (mean, SD, graphs) for data analysis.

Results

The endoscopic findings from the GI tract revealed cases with inflammation of the esophagus (esophagitis) or stomach (gastritis), ulcers, gastroesophageal reflux disease (GERD), enlarged and swollen veins in the esophagus or stomach (varices), hematemesis (vomiting blood), hiatal hernia, narrowing (stricture) of the esophagus, infections, Barrett's esophagus (a condition that increases the risk for developing esophageal cancer), cancers (CA post-cricoid region, CA hypopharynx, Esophageal squamous cell carcinoma, Esophageal adenocarcinoma, gastric, periampullary, duodenal cancer etc.).

Based on upper GI endoscopy, cases are broadly categorized into structural disorders, injury, infections and infestation, acid peptic disorders (APD), vascular disorders (varices, PHTN, PHG) and malignancies. Year-wise endoscopic results are given below:

From 2009 data

A total of 3179 endoscopies were performed, of which 65.3% (2073) were males and 34.7% (1106) were females. The epidemic trend of endoscopic pathologies was found to be as follows - 384 (245 males:139 females) cases showed structural disorders (hiatal hernia, diverticulae and achalasia cardia etc) with mean age of the patients: 43.38 yr (+/- 17.9); 60 cases (42 males:18 females) reported with injuries, mean age of the patients being 30.5 yr (+/-17.17); 45 endoscopic cases (33 males:12 females) were found to be infectious (candidal, helmenthis), mean patient-age was 47.3 yr (+/-12.7); a large size of the population (25%) i.e 808 cases (575 males:233 females) were found to be affected by acid peptic diseases (peptic acid disorders) (erosions, ulcers, GERD and gastritis) with the mean age of 41.9 yr (+/- 16.1); 395 patients (287 males:108 females) were diagnosed with vascular disorders (varices, PHTN, PHG, ectasia) with mean age of 35 yr (+/-17.24); 244 cases (149 males:95 females) cases came with different type of malignancies (esophageal, stomach and duodenum) with mean age of 52.8 yr (+/-13). Of all endoscopies performed, 35% cases i.e 1123 cases (659 males:464 females) showed a normal diagnosis with the mean age of 34.4 yr (+/-15.6) (Table 1, Figure 2).

From 2010 data

A total of 3307 endoscopies were performed, of which 64.7% (2142) were males and 35.2% (1165) were

females. The epidemic trend of endoscopic pathologies was found to be as follows - 338 cases (225 males:113 females) showed structural disorders with mean age of the patient: 43.79 yr (+/- 16.8); 74 cases (47 males:27 females) reported with injuries, mean age of the patient being 31.6 yr (+/-14.3); 42 endoscopic cases (29 males:13 females) were found to be infectious with mean age of the patient as 40.9 yr (+/-16.3); a large size of the population (30%) i.e 999 cases (716 males:283 females) were found to be affected by acid peptic diseases with mean age of 41.1 yr (+/- 15.8); 369 patients (267 males:102 females) were diagnosed with vascular disorders with mean age of 36.4 yr (+/-16.4, 200 cases (130 males:70 females) with malignancies of the esophagus, stomach and duodenum, with mean age of 54.6 yr (+/-13). Of all the endoscopies performed, 35.6% cases i.e 1178 (645 males:533 females) cases showed normal diagnosis with mean age of 35.3 yr (+/-16) (Table 1, Figure 3).

From 2011 data

A total of 3543 endoscopies were performed, of which 63.6% (2253) were males and 36.4% (1290) were females. The epidemic trend of pathologies for this year was - 345 cases (223 males:122 females) with structural disorders and mean age of the patient as 41.1 yr (+/- 17.1; 85 cases (50 males:35 females) with injuries, the mean age of the patient being 34.9 yr (+/-13.2); 56 cases (34 males:22

females) with infectious esophagitis and mean age of the patient as 49 yr (+/-13.8); a large size of the population (30%) i.e 1084 cases (752 males:332 females) with acid peptic diseases with mean age of 40.6 yr (+/- 16.7); 606 patients (436 males:170 females) diagnosed with vascular disorders with mean age of 37.2 yr (+/-16.6); 194 cases (115 males:79 females) with malignancies with mean age of 53.3 yr (+/-14). Of all the endoscopies, 30% cases i.e 1092 (592 males:500 females) cases showed normal diagnosis with mean age of 35 yr (+/-15.8) (Table 1, Figure 4).

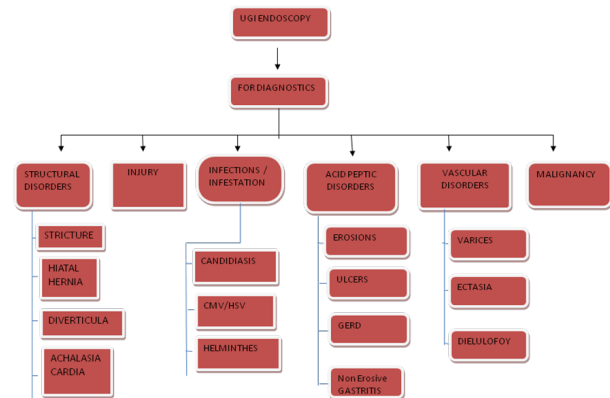


Figure 1. Diagnostic Endoscopic Impressions Categorization for Analysis

Table 1. UGI Cases Categorization

| | DATA 2009 | M (%) | F (%) | DATA 2010 | M (%) | F (%) | DATA 2011 | M (%) | F (%) | TOTAL3YEARS |
|--------------------|--------------|-------|-------|---------------|-------|-------|--------------|-------|-------|---------------|
| STRUCTURAL | 384 (12%) | 63 | 37 | 338 (10.2%) | 66.6 | 33.4 | 345 (9.73%) | 64.6 | 35.4 | 1067 (10.63%) |
| INJURY | 60 (1.8%) | 69 | 31 | 74 (2.2%) | 63.5 | 36.5 | 85 (2.39%) | 58.8 | 41.2 | 219 (2.17%) |
| INFECTION | 45 (1.4%) | 73 | 27 | 42 (1.26%) | 69 | 31 | 56 (1.57%) | 60.7 | 39.3 | 143 (1.42%) |
| APD | 602 (18.9%) | 71 | 29 | 724 (21.9%) | 70.8 | 29.2 | 774 (21.8%) | 69 | 31 | 2100 (20.94%) |
| GERD | 206 (6.4%) | 73 | 27 | 275 (8.3%) | 74.2 | 25.8 | 310 (8.8%) | 70 | 30 | 791 (7.89%) |
| VASCULAR | | | | | | | | | | |
| (Varices+PHTN+PHG) | 395 (12.4%) | 73 | 27 | 369 (11.15%) | 72.4 | 27.6 | 606 (17.09%) | 71.9 | 28.1 | 1370 (13.64%) |
| VARICTES* | 172 (5.4%) | 73.2 | 27 | 134 (4%) | 71.6 | 28.4 | 261 (7.3%) | 70.3 | 29.7 | 567 (5.65%) |
| PHTN* | 223 (7%) | 72 | 28 | 215 (6.5%) | 73 | 27 | 274 (7.7%) | 69.3 | 30.6 | 712 (7.09%) |
| PHG* | 0(0%) | 0 | 0 | 20 (0.6%) | 70 | 30 | 70 (1.97%) | 87.5 | 12.5 | 90 (0.8%) |
| MALIGNANCY | 244 (7.67%) | 61 | 39 | 200 (6.04%) | 65 | 35 | 194 (5.4%) | 59 | 41 | 638 (6.35%) |
| FOREIGN BODY | 4 (0.12%) | 75 | 25 | 0(0%) | 0 | 0 | 5 (0.14%) | 60 | 40 | 9 (0.08%) |
| HEMORRHAGE | 19 (0.5%) | 68.4 | 31.6 | 15 (0.45%) | 80 | 20 | 13 (0.366%) | 46 | 54 | 47 (0.46%) |
| POST GJ STATUS | 21 (0.66%) | 85.7 | 14.3 | 34 (1.02%) | 97 | 3 | 18 (0.5%) | 83.3 | 16.7 | 73 (0.72%) |
| NORMAL | 1123 (35.3%) | 58.8 | 41.2 | 1178 (35.64%) | 54.7 | 45.2 | 1092 (30.8%) | 54.2 | 45.8 | 3393 (33.8%) |
| INCOMPLETE STUDY | 59 (1.85%) | 62.7 | 37.3 | 47 (1.42%) | 63.8 | 36.2 | 37 (1.04%) | 54 | 46 | 143 (1.42%) |
| NOT CO OPERATIVE | 17 (0.5%) | 70.5 | 29.5 | 11 (0.33%) | 73 | 27 | 8 (0.22%) | 87.5 | 12.5 | 36 (0.35%) |
| TOTAL | 3179 | | | 3307 | | | | | | 10,029 |

* mark categories are not included in grand total, as they are in vascular category

Table 2. Malignancies Diagnosed under Endoscopic Evaluation

| Type of Malignancy | Year 2009 | Year 2010 | Year 2011 |
|---------------------------------|------------------|----------------|---------------|
| Ca Pharynx & Ca Post Cricoid | 7+16 = 23 (9.5%) | 4+10=14 (7%) | 7+8=15 (8.4%) |
| Ca Esophagus | 97 (40%) | 82 (41.2%) | 58 (32.4%) |
| Ca Ge Junction | 11 (4.5%) | 10 (5%) | 9 (5%) |
| Ca Stomach | 103(42.5%) | 78 (39.1%) | 84 (46.9%) |
| Ca Deodenum & Ca Peri Ampullary | 7+1=8 (3.3%) | 12+3=15 (7.5%) | 6+7=13 (7.3%) |
| Unknown | 2 | 1 | 14 |
| Total | 244 | 200 | 193 |
| Final Total | 242 | 199 | 179 |

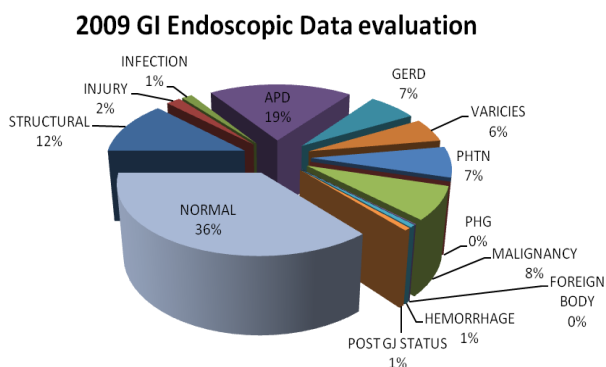


Figure 2. UGI Cases Categorization and Comparison by Pie Chart

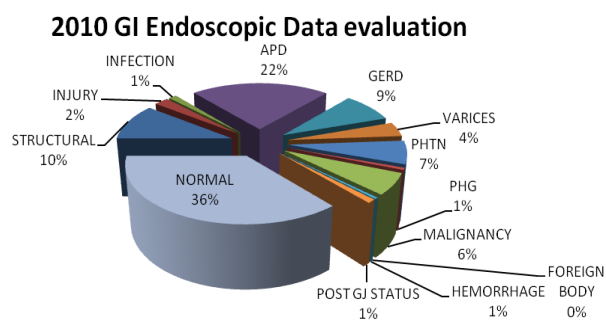


Figure 3. UGI Cases Categorization and Comparison by Pie Chart

A total of 10,029 (6468 males and 3561 females) endoscopies was performed during 2009 to 2011. The male to female ratio was found to be 1.8:1. Table 1 gives the comparative picture of the different UGI disorders reported during the three-year period and the changing trends in the appearance of these pathologies in the population during this period (Table 1, Figure 5).

Discussion

Digestive tract disorders significantly affect millions of people worldwide and have a significant economic impact in terms of health-care and work absenteeism. In the present study, a comparison between the three consecutive-year data was performed to look at the epidemic trends of different UGI endoscopic anomalies prevailing in our population. Our data reveal a greater percentage of males affected with UGI disorders than females in our population indicated by the male to female ratio of the endoscopic evaluations done in the three years (1.8:1). This ratio is similar to the male:female ratios mentioned in reports from other parts of the country or elsewhere in the world (Aduful et al., 2007; Olokoba et al., 2010; Khan et al., 2014).

Our primary interest was to look at different malignancies prevalent in upper GI and their burden in our population, but we found that other than malignancies there were a number of common pathologies in our population, leading to debilitating conditions and poor quality of life in individuals suffering from them. The hospital where the study was conducted is a tertiary-care center and a referral hospital. The endoscopic evaluations

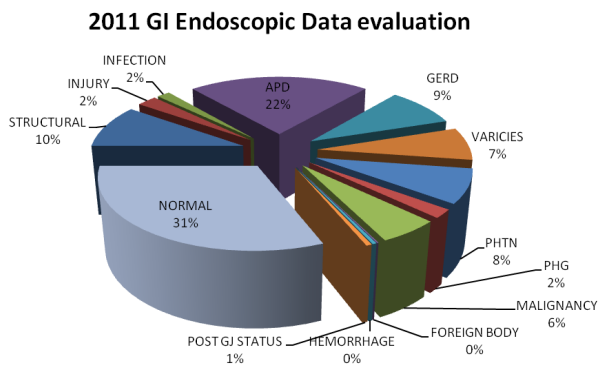


Figure 4. 2011: UGI Cases Categorization and Comparison by Pie Chart

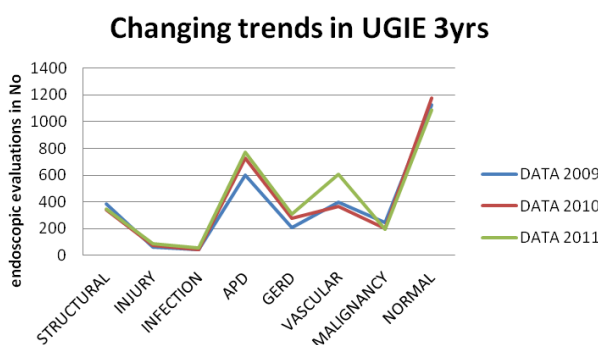


Figure 5. UGI Pathologies Changing Trend: A Graphical Representation

were mostly outpatient cases; some cases were referred from within the hospital from surgery and trauma sections.

In three years, a total of 10,029 endoscopies were performed in the department of Gastroenterology, Osmania General Hospital, by the team of gastroenterologists (four authors of the manuscript and others). The Endoscopic procedures are performed as per the routine endoscopic protocol. An Olympus video endoscope was used for visual examination and diagnosis. Endoscopic evaluation has an advantage over different other diagnostic methods because of its direct visualization of different sites of the UGI tract and sampling from the site of interest. The feasibility in the endoscopic procedure for obtaining the histological materials makes it a superior diagnostic tool for GI related abnormalities (Tytgat, 2002). Endoscopy also has a therapeutic application for polypectomy, gastrostomy, variceal ligation, stenting, stricture dilatation and other ERCP guided therapies (Michael, 2007). Almost all precancerous polyps can be removed painlessly using an endoscope.

Overall, ~30% of endoscopies evaluated were found to be suffering from acid peptic disorders, 13.6% cases with vascular-related abnormalities, 10.6% endoscopic evaluations showed structural abnormalities, followed by malignancies which accounted for 6.3% (including cancer of pharynx, post-cricoid, esophageal squamous cancer (ESCC), cancer at GE junction (adenocarcinoma), stomach cancer, duodenum cancer).

Overall prevalence of UGI malignancies was found to be following a decreasing trend during these three years,

unlike other world data. Very few cases presented with malignancy below the age of 19 years. Highest cancer prevalence was found to be in the age group of 60-69 yrs, followed by 50-59 yr age group in our region; a study from Chattisgarh placed the peaking of prevalence in the fifth decade with mean age at 41 years (Khan et al., 2014). Upon observation of prevalence rates of individual cancers, we see that most of them followed a changing trend: prevalence of cancer of the upper esophagus decreased from 40% to 32.4%, in the three year period studied, possibly due to the awareness programs about the effects of tobacco and alcohol in our population via social media (Kaur et al., 2011; Garg et al., 2013; Anjum et al., 2014) prevalence rate of cancer of the lower oesophagus (GE junction) remained unchanged. The burden of stomach cancer cases increased from 42.5% in year 2009 to 47% in 2011. Likewise cancer in the duodenum also rose from 3.3% to 7.3% during this period. Ca Pharynx and post-cricoid also did not show any change (Table 2).

Burden of malignancies was mostly observed in older age group (60 to 69 years) which was seen to be ~30% of all malignancies diagnosed in the population during three consecutive years. In the age group 50-59 years, mean percent of population affected with malignancies was found to be 25%. Most of our cancers were sporadic and prevalent in the elderly population, that is above 50-year age group. These sporadic cancers could be attributed to genetic abuse during the lifetime of the individuals in the form of unhealthy lifestyle, personal habits like poor exercise, consumption of tobacco, alcohol, poor dietary practices, etc. leading to chronic ill-health, promoting specific genic changes that may trigger carcinogenesis with advancing age; this would be in addition to individual susceptibilities to malignancy.

Endoscopic evaluations were performed based on the symptoms and severity of the condition presented by the patient. The normal endoscopies reported from other studies show higher percentages than ours indicating better selection criteria for endoscopic investigation of our cases referred with UGI tract symptoms (Khan et al., 2014). The decreasing trend from 35.3% to 30.8 % of endoscopically normal cases in the present study over the three years, also suggests the same. Overall, in the three consecutive years, we observed a mean 32% of the endoscopic evaluations showing a normal study. Of these, 45% cases were found to belong to the 30-39 year age group and 28% of cases in the 40-49 year age group. We can assume that patients presenting with symptoms related to GI tract disorders that were referred for investigation mostly belonged to the 30-39 year age group, however they showed absence of a tissue pathology upon endoscopic observation. If these conditions recurred or were allowed to become chronic with age, there probably was gradual accumulation of genomic damage, that could lead to more severe pathologies at a later age in a percent of these cases.

In the present study we observed that the vascular disorders are seen in almost all age groups (20 to 59 years). Reports of vascular disorders endoscopically diagnosed seemed to reduce from 15% in 2009 to 8% in 2011. In older age group, portal hepatic gastropathy (PHG) was frequently seen and could be attributed to hepatic

infections or abnormalities due to alcoholic liver diseases (liver cirrhosis induced by alcohol abuse or Hepatitis B or HCV viral infections or idiopathic). In the younger age group (<10yrs), early appearance of varices / PHTN is due to NCPF (Non-cirrhotic portal fibrosis) and EHPVO (Extra-hepatic portal vein obstruction) which could be attributed to nutritional deficiencies / infections (Thomas et al., 2009; Bemeur et al., 2010).

Human evolution defines us as primarily herbivores; saliva contains alpha-amylase, designed to break-down complex carbohydrates into sugar compounds. Our teeth are designed to cut vegetable matter and grind grains. Advertising and misinformation about healthy diets have over-shadowed human nutritional needs. One of America's pioneering biochemists and nutrition researchers, Dr. Edward Howell (1986), cites numerous animal studies where huge amounts of pancreatic enzymes are squandered in digesting foods devoid of natural enzymes. The result of this wasteful outpouring of pancreatic digestive enzymes is a decrease in the supply of crucial metabolic enzymes and impaired health.

Toxins finding their way into the GI tract include, but are not limited to, food additives, pesticides, and specific foods that induce a reaction from the GI tract. GI tract is a sensory organ that rejects such ingested toxins through vomiting, diarrhea, etc and can protect the body. The immune sensors in the MALT trigger responses such as nausea, vomiting, pain, and swelling when it senses foods with a strong allergic or toxic component. The precise causes for most of the cancers are yet to be understood. Genetic factors that get altered due to our extrinsic and intrinsic environment definitely have a role to play along with genetic susceptibility of individuals due to gene polymorphisms (Jainan et al., 2014). Our earlier studies on esophageal cancer have shown that tobacco and alcohol have an association with risk for esophageal cancer when compared to control subjects (Chava et al., 2011; Mohiuddin et al., 2013). Most people are not aware that smoking cigarettes doesn't just have a bad effect on heart and lungs but also affects increased acid secretion in stomach. Apart from smoking, stress also induces hormonal changes which cause the stomach to produce more acid, more reflux, leading to acid peptic diseases and GERD (gastro esophageal reflux diseases). APD (acid peptic diseases) and GERD are found to be gradually increasing over the three year period probably due to the altered dietary habits and stressful lifestyle. Male to female ratio (7:3) and age distribution was almost constant. Most commonly seen in males belonging to all age groups (20 to 59 years) (mean age 41 years SD +/-16). The increased incidence of APD and GERD in male population is due to alcohol and tobacco abuse though the details of personal habits of patients in our cases have not been statistically evaluated.

Highest incidence of infections was to be found in 40-59 year age group which includes 55% in 2009, 31% in 2010 and 48% in 2011. The patients who were immune-compromized/susceptible to infection showed infections like candidiasis. The over-growth of *Candida* in the UGI tract reduces the acidity of intestine as the organism prefers to grow in alkaline conditions. One of *Candida*'s

byproducts is ammonia that forms when *Candida albicans* ferments sugar in the intestine. Ammonia increases the alkalinity of digestive tract, and has even been found to promote the growth of other yeasts. *Candida* also produces ethanol which can have an intoxicating effect on body. It interferes with the production of thyroid hormones, giving rise to hypothyroidism, and can put a stress on the liver (Calderone et al., 2001; Vazquez et al., 2002).

There have been reports on the persistence of *H. pylori* in the stomach and increased incidence of gastric cancers while the presence of *H. pylori* in the esophagus has been reported to be protective against esophageal adenocarcinomas (Islami et al., 2008; Whiteman et al., 2010; Saha et al., 2013; Cam 2014; Vannarath et al., 2014). When exposed to harsh, acidic environment, *H. pylori* secretes an enzyme called urease, which converts the chemical urea to ammonia. The production of ammonia around *H. pylori* neutralizes the acidity of the stomach, leading to gastric disorders while the same action of the organism could be proving beneficial to the esophageal tract protecting it from the injury due to acid reflux (Smoot et al., 1990; Ha et al., 2001). In this case, eradication of *H. pylori* itself seems disputable, however a hope for better therapeutic and antibacterial drugs may solve the problem. In our present study due to lack of sufficient data about *H. pylori* infection status we are unable to comment on its prevalence in our population or cases.

Sulforaphane is naturally found in broccoli and other cruciferous vegetables such as Brussels sprouts, cauliflower, kale, and cabbage, with broccoli sprouts. The dual actions of sulforaphane in inhibiting *H. pylori* infections and blocking gastric tumor formation thus working synergistically to provide diet-based protection against gastric cancer in humans. UGI abnormalities mostly functional, infections and APDs can be prevented by consumption of fresh fruits and vegetables, avoiding fatty food, controlling obesity, cessation of alcohol, tobacco and avoiding unnecessary use of medications. Increasing fiber in the diet, avoiding or decreasing the use of NSAID, avoiding caffeine, monitoring foods which trigger acidity, minimizing stress or learning different ways to cope with stress, and taking appropriate and timely medication as prescribed by physician would help manage APD and GERD. Adenomatous and hyperplastic polyps may occur in the presence of chronic gastritis and/or *H. pylori* infection. Gastric cancer has been found in 1.3% of patients during follow-up (Seifert et al., 1983). Patients with a family history of GI cancers / polyposis (multiple polyps) should have an endoscopy done beginning at age 40 or 10 years younger than the youngest family member affected with cancer (Fatemi et al., 2014).

A detailed observation of the changing trends in the prevalence of upper GI endoscopy abnormalities in our population will be useful in the setting appropriate guidelines for personal healthcare and patient management. Endoscopic diagnosis is a useful tool for the early detection of upper GI anomalies and helpful for physicians to take decisions on treatment and management of varied kinds of UGI diseases. We observed that the increased incidence of APD and GERD in our population might be due to the change in lifestyle (adoption of western

food habits like fast foods, addiction to alcohol and consumption of tobacco) of our population. An overall decrease in the incidences of upper GI malignancies seen from our hospital-based study is good sign, though an increasing trend was observed for some specific type of cancers (cancer of stomach and duodenum). There is need for planning a large epidemiological survey to design good strategy for screening and early detection programs of these cancers.

Evaluation of patient data stored in hospitals will aid long-term epidemiological studies and help find out different etiological agents (environmental and personal) involved in disease causation. Clinical data and study of risk factors associated with different diseases will be helpful in proper planning of screening programs for our population, in order to reduce the incidence of not only malignancies, but also other common, UGI disorders that may take a toll on the quality of life of an individual.

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