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Incidence of gastrointestinal and upper airway malignancies in a tertiary care hospital: A Hospital Based Study from North Eastern India

Neel Kanth Issar[1], E. Synrem[1], Bhupen Barman[1], Tazo Beyong[1], I. Tiewsoh[1], Preeti Jane Picardo[1], B. Wankhar[2], Yookarin Khonglah[3] and K.G. Lynrah[*1]

[1]*Department of Medicine, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong, India*
[2]*Department of Radiodiagnosis, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, (NEIGRIHMS), Shillong, India*
[3]*Department of Pathology, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong, India*

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***Correspondence Info:**
Dr. K.G. Lynrah
Associate Professor,
Department of Medicine,
North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong, India

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Abstract

Aims and Objectives: To find out the incidence and the spectrum of anatomical distributions of gastrointestinal and upper airway malignancies.

Materials and Methods: This is a Hospital based prospective observational study carried out in a tertiary hospital over a period of one year. All patients detected to have gastrointestinal and upper airway malignancy by endoscopy were taken up for the study.

Results: A total of 116 patients (92 males and 24 females) were studied. There were 113 patients (90 males and 23 females) with upper gastrointestinal/upper airway malignancies and 3 patients (2 males and 1 female) with lower GI malignancy. The age ranges from 28 years to 85 years. The mean age of the patients was 52.21±11.93 years (51.65 years for male and 54.39 years for females). Dysphagia was the most common presenting symptom and 70 of them (61.9%) presented with dysphagia in this study. The common risks factors are tobacco, smoking and chewing of betel nut. In this study 73 cases (64.6%) consumes tobacco, 74 cases (65.4%) smokes, 47 cases (41.5%) consume regular fermented food and smoked meat, 34 cases (30%) takes alcohol. The most common site of upper G.I malignancy is esophagus comprising 68 cases (58.1%) out of 113 cases, followed by Stomach 09 cases (7.6%) and Tongue 03 cases (2.5%). While in the upper airway the sites of involvement were Larynx 22 cases (18.8%), Pharynx 08 cases (6.8%), Pyriform fossa 07 cases (6.1%). Out of a total of 113 cases with upper GI/upper airway malignancy, 4 cases had dual site of involvement. 2 patients had esophagus and pharyngeal carcinoma, 1 patient had esophagus and stomach carcinoma and 1 patient had tongue and laryngeal carcinoma.

Conclusion: Endoscopy is one of the standard modality for diagnosis of different diseases of the GI tract. Various gastro intestinal diseases could be diagnosed with greater precision as direct visualization of the different lesions with an additional advantage of sampling of tissues for biopsy from Upper and Lower GI as well as from upper airway lesions.

Keywords: Malignancy; Upper airway; Esophagus; Gastric; Colon.

1. Introduction

In spite of good advancements for diagnosis and treatment, cancer is still a big problem to our society.[1] This is the second most common disease after cardiovascular disorders accounting for maximum deaths in the world.[2] It accounts for about 23% and 7% deaths in USA and India, respectively.[3] The magnitude of cancer problem in the Indian Sub-continent is increasing due to

poor to moderate living standards and inadequate comprehensive medical facilities.[4] Most frequently observed cancers in Indian population are lungs, breast, colon, rectum, stomach and liver.[5]

North-East region of India has different customs, food habits, life-style, diverse ethnic groups, type and pattern of tobacco use in as compared to the rest of the country. There has been a substantial increase in the incidences of oral sub-mucous fibrosis; especially among youngsters, which further increased the incidence of the oral cancer. [6] presently, oral cancer is the fourth common type of malignancy after lung, stomach and liver in males. It is the fifth common cancer after cervix, breast, stomach and lung cancer in females. [7]

The incidence of esophageal cancer in India is moderately high; it is one of the cancers that are strongly associated with diets and lifestyles. According to a data from cancer registries in India, esophageal cancer is the second most common cancer among males and the fourth most common cancer among females. [8]

Stomach is another organ with a high incidence of cancer and stands at fifth position. [9] South East Asian countries including India were reported to have lower rates of stomach cancers. However, the prevalence of stomach cancer is found to be quite high in Mizoram a state in the North eastern part of India. On the basis of the prevalence of stomach cancer, Mizoram occupied the first position among the Indian states. Moreover, this state stands at fifth position in the number of gastric cancer globally. [10]

Colorectal cancer is a disease that usually affects middle aged individual. There is a sharp increase in the incidence rate of colorectal cancer after the age of 45 years and 90% of cases are found in persons over the age of 50 years. [11]

In 2010 cancer burden was quite alarming at 25 millions globally and 2.5 millions for India.[12] Not only the same trend prevails in the Northeast India but certain types of cancers are relatively very high in the region like in Meghalaya its Esophageal and Hypopharyngeal cancers, Stomach Cancer in Mizoram, Nasopharyngeal and Lung Cancers in Manipur, Esophageal , Hypopharyngeal and Oral Cancers in Assam, Stomach and Nasopharyngeal Cancers in Nagaland, Stomach cancer is also common in Arunachal Pradesh and Sikkim likely because of popular habit of consuming smoked meat, higher alcohol drinking habits and high level of cigarette smoking, fermented, salted fish, betel nut, consumption.

Upper and Lower G.I. endoscopy is one of the standard modality for diagnosis of different diseases of the GI tract. Direct visualization of the different lesions with an additional advantage of sampling of tissues for biopsy from the lesions makes endoscopy the most important choice for the diagnosis of diseases of the gastrointestinal tract and raises Endoscopy to a higher position and ahead of the other diagnostic modalities. In addition Upper GI Endoscopy can detect diseases affecting the upper airway like epiglottis, pyriform fossa, supraglottic and glottic region. Endoscopy helps in early detection of cancer, early detection and treatment of cancers is the most important factor to achieve cure/ better patient's outcome. The spectrum of gastrointestinal malignancies is diverse and varies with respect to geographical locations, demographic characteristics, ethnicity, socioeconomic background as well as various lifestyle and dietary habits.

1.1 Aim and objective:

To find out the incidence and the spectrum of anatomical distributions of gastrointestinal and upper airway malignancies

2. Material and method

This is a Hospital based prospective observational study carried out in a tertiary care hospital over a period of one year. All patients detected to have possible malignant lesions on Endoscopy were included in the study. While undergoing endoscopy, findings are noted, details of the site, extent, and type of the lesion were recorded and multiple biopsies were taken from suspected lesions and were subjected for histopathological examination. In addition all the patients are enquired about their food habits, smoking, alcohol, betel nut and other forms of tobacco used.

3. Results

A total of 116 patients with confirmed malignant lesions were included. During the period 2,658 Upper gastrointestinal endoscopy and 77 Lower gastrointestinal endoscopies was carried out. Out of which, 113 (4.2%) and 3 (3.8%) patients had malignant lesions in Upper and Lower GI endoscopies respectively (Table 1). In Upper GI endoscopy, the majority of the patients were males with 90 cases (79.6%) and females to 23 cases (20.3%) with a male female ratio of 3.9:1. The mean age of patients was 52.21 ± 11.93 years, males 51.65 years and for females 54.39 years respectively and age ranges from 28years to 85 years (Table 2). Patients presented with various symptoms, dysphagia was the most common symptoms followed by cervical metastatic lymphadenopathy, hoarseness/stridor, dyspepsia, anemia etc. (Table 3). The most common site of upper GI/upper airway malignancy in our study is Esophagus 68 cases (58.1%) followed by Larynx 22 cases (18.8%), Stomach 09 cases (7.6%), Pharynx 08 cases (6.8%), pyriform fossa 07 cases (6.1%) and Tongue 03 cases (2.5%). Out of a total of 113 cases with upper GI/upper airway malignancy, 4 cases had dual site of involvement. 2 patients had esophagus and pharyngeal carcinoma, 1 patient had esophagus and stomach carcinoma and 1 patient had tongue and laryngeal carcinoma (Table 4). Males are affected more by the disease irrespected of the site of

involvement (Table 5). The most common malignant GI malignancy in this study is esophagus and the most common site of esophagus is the middle third (63.2 %) (Figure 6).

All endoscopic findings were correlated with biopsy findings. The most common type of carcinoma from the upper GI endoscopic/ upper airway lesions is Squamous cell carcinoma 104 (92%) and adenocarcinoma carcinoma in 9(8%) patients (Table 7). Most of the Squamous cell carcinomas are of moderately differentiated types 53 (47%), followed by Well and Poorly differentiated types, 27 (23.4%) and 23 (22%) cases respectively (Table 8). In patients with adenocarcinoma, most of the cases are of poorly differentiated types 5(55.5%). Among the 9 patents with Adenocarcinoma, 8 patients had stomach cancer while 1 had adenocarcinoma of the esophagus (Table 9).

Among all patients suffering from malignancies, 74 (65.4%) of them smokes cigarette, 73 (64.6%) patients are in the habit of taking tobacco orally, 73 (64.6%) patients takes betel nut, 47 (41.5%) patients takes fermented food, smoked meat regularly, 34(30%) patients takes alcohol regularly and 2 (1.7%) patients had family history of cancer (Table 10).

Table 1: Distribution of GI endoscopies

Upper GI endoscopies	Lower GI endoscopies
Total : 2,658	Total : 77
Malignancy: 113 (4.2%)	Malignancy: 3 (3.8%)

Table 2: Age wise distribution of Upper G.I malignancy

Age (years)	Number of patients (n=113)	Percentage
≤ 30 yrs	5	4.40%
31-40	11	9.70%
41-50 yrs	43	38%
51-60 yrs	22	19.40%
61-70 yrs	25	22%

Table 3: Symptoms of patients with Upper GI/Upper airway malignancy

Indications / Symptoms	Number of Patients (N=113)	Percentage
Dysphagia	70	61.90%
Dyspepsia	7	6.10%
Gastric outlet obstruction	1	0.80%
Hepatic SOL* and Ascites	2	1.70%
Hematemesis	1	0.80%
Hoarseness of voice, Stridor	11	9.70%
Lymph node / Neck swelling	15	13.20%
Throat pain, Foreign body sensation in throat	5	4.40%
Anaemia	2	1.70%

* SOL: Space Occupying Lesion

Table 4: Sites of distribution of Upper GI/Upper airway malignancy

Location of Malignancy	Number of Cases=117 (113 + 4)	Percentage
Tongue	03	2.5%
Pharynx	08	6.8%
Pyriform fossa	07	6.1%
Larynx	22	18.8%
Esophagus	68	58.1%
Stomach	09	7.6%

Figure: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Table5: Sex wise distribution of Upper GI/Upper airway malignancy

Site	Male (90)	Percentage	Female (23)	Percentage
Tongue	03	3.3%	00	00
Pharynx	07	7.7%	01	4.3%
Pyriform fossa	06	6.6%	01	4.3%
Larynx	20	22.2%	02	8.6%
Esophagus	51	56.6%	17	74%
Stomach	07	7.7%	02	8.6%

Table 6: Distribution of Esophageal malignancy

Part of Esophagus (Distance From Incisors)	Number of Cases	Percentage
Upper third (18-24cm)	11	16.10%
Middle third (24-32cm)	43	63.20%
Lower third (32-40cm)	14	20.50%

Table7: Pathological types of carcinoma

Type	Number of Patients (N=113)
Squamous cell carcinoma	104 (92%)
Adenocarcinoma	09 (8%)

Table 8: Distribution of Squamous Cell Carcinoma

Grades	Number of Patients (104)
Highly Dysplastic	01 (0.9%)
Well Differentiated	27 (23.4%)
Moderately Differentiated	53 (47%)
Poorly Differentiated	23 (22%)

Table 9: Distribution of Adenocarcinoma

Grades	Number of Patients (9)
Highly Dysplastic	01 (11%)
Early Gastric Adenocarcinoma	01 (11%)
Well Differentiated	01 (11%)
Moderate Differentiated	01 (11%)
Poorly Differentiated	05 (55.5%)

Table10: Risk Factors for Upper GI/Upper airway malignancy

Risk Factor	Number of Patients (N=113)	Percentage
Tobacco	73	64.6%
Smoking	74	65.4%
Betel nut	73	64.6%
Salted & Fermented food, smoked meat	47	41.5%
Alcohol	34	30%
Family History	2	1.7%

Out of 77 lower G.I endoscopies, 3 patients were found to have malignancy; two of them were males and one female. All three patients had adenocarcinoma of colon (Table 11).

Table 11: Patients with lower GI malignancy

Case No.	Age	Sex	Indication	Site	Diagnosis
1	89 yrs	M	Persistent Diarrhoea	Recto-sigmoid	Infiltrating Adenocarcinoma
2	64 yrs	F	Bleeding PR	Colon	Well differentiated adenocarcinoma
3	65 yrs	M	Constipation and Hepatic SOL*	Colon	Moderately differentiated adenocarcinoma

*SOL: Space occupying lesion

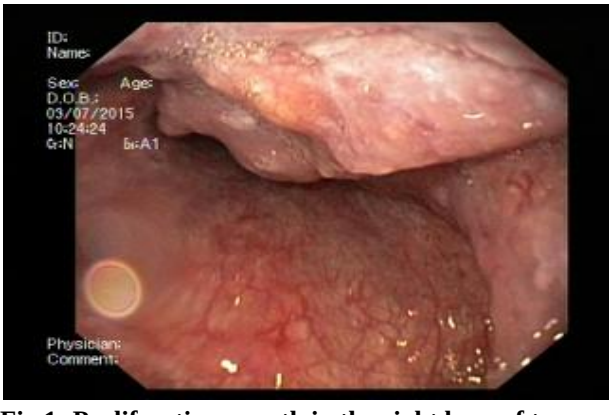

Fig 1: Proliferative growth in the right base of tongue

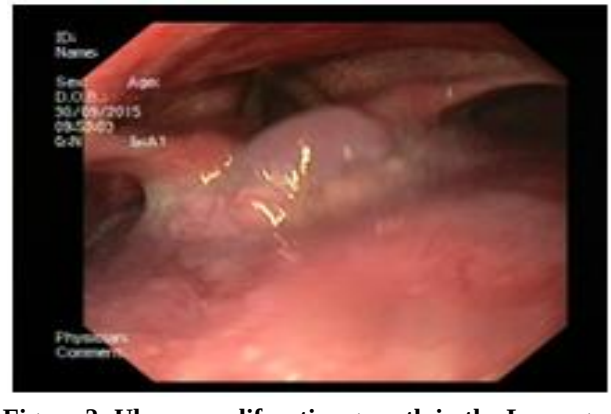

Figure 2: Ulcero-proliferative growth in the Laryngo-Pharynx

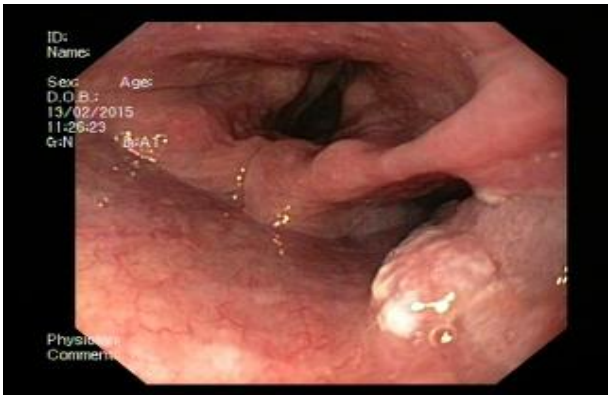

Figure 3: Small proliferative growth in the right Lateral pharyngeal wall

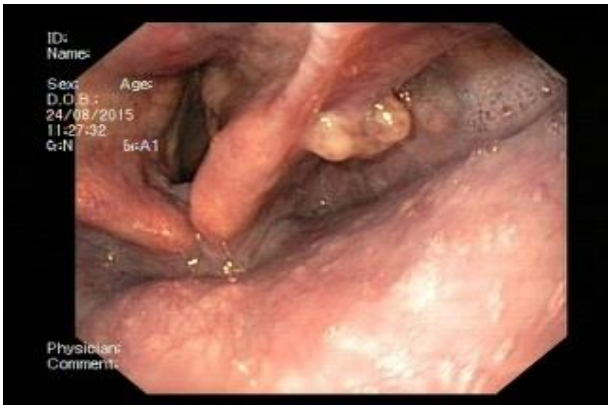

Figure 4: Polypoidal mass in the right epiglottic fold

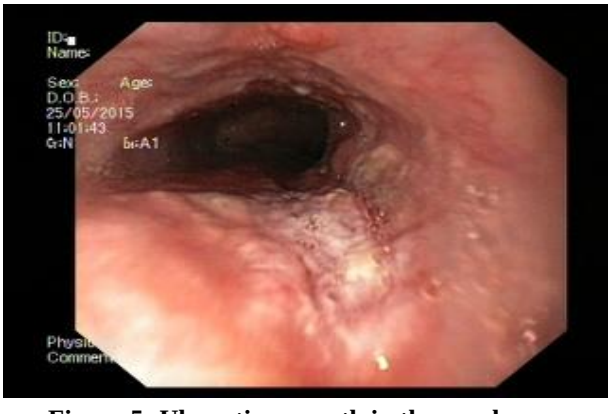

Figure 5: Ulcerative growth in the esophagus

Figure 6: Ulcerative growth espophagus with fistula opening

Figure7: Ulcerative growth involving fundus, body and antrum

Figure 8: Ulcerative growth involving lesser curvature and antrum extending to the pylorus

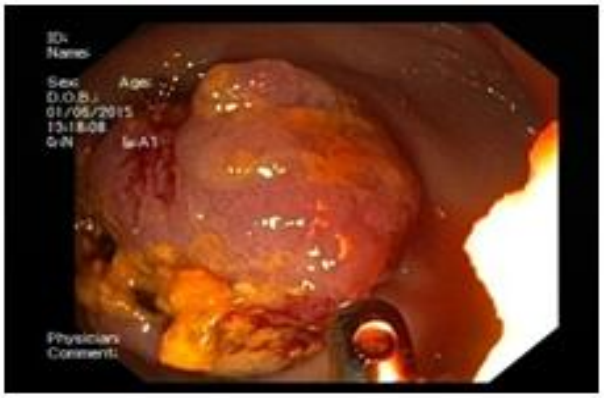

Figure 9: Large polypoidal mass in the rectosigmoid junction

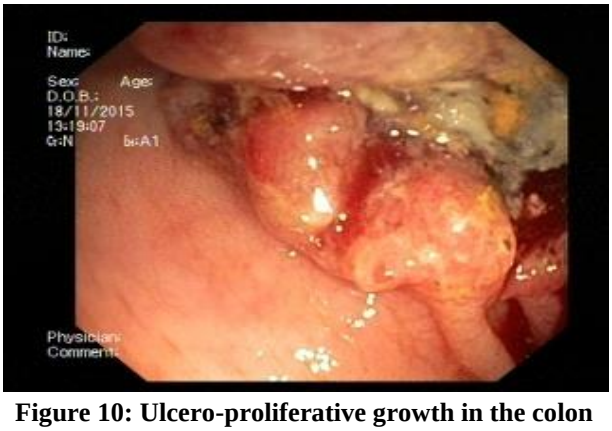

Figure 10: Ulcero-proliferative growth in the colon

4. Discussion

4.1 Cases and sex distribution

In spite of good advancements for diagnosis and treatment, cancer is still a big problem to our society. This is the second most common disease after cardiovascular disorders accounting for maximum deaths in the world.

More than 70% of the cases report to health care providers in the advanced stages of the disease, which lead to a poor outcome and high mortality rate.

Dyspeptic symptoms, which are very common in population, are the most frequent indication for an upper G.I endoscopy. The uncertainty regarding which patients should undergo endoscopy is not clear in developing countries like ours. Performing endoscopy for all patients of dyspepsia is not only advisable but not feasible. However a number of symptoms/signs like dyspepsia in elderly group, dysphagia, odynophagia, persistent vomiting, GI bleeding, weight loss, anemia, bleeding per rectum, diarrhoea and constipation have been suggested as indicators of high risk for a serious disease. [11]

In the present study, 2,735 endoscopies was carried out in one year, of which 2,658 were upper G.I endoscopies and 77 lower G.I endoscopies. And out of 2,658 upper G.I endoscopies, 113 (4.2%) had malignant lesions as compared to Lower G.I endoscopies where only 3 (3.8%) patients out of 77 had evidence of malignancy. In this study majority of the patients were males in both upper G.I endoscopies and Lower G.I endoscopies, In Upper GI Endoscopies there were 90 males (79.6%) and 23 females (20.3%) patients with malignancy with a male: female ratio of 3.9:1 while In Lower GI Endoscopy, there were 2 males and 1 female patients with malignancy with a male: female ratio of 2:1.

In the present study, esophageal carcinoma is the most common organ involved 68 cases (58.1%), out of which 51 cases were males and 17 cases were females.

In a study from southern India by Kumar [12], out of 2724 gastrointestinal specimens, 300 (11%) specimens were malignant and showed an overall male preponderance among malignancies of GI tract.

In a study from Manipur by Barad *et al* [13] patients were diagnosed with primary gastric cancer was more common in males with male to female ratio of 2.16:1.

Paymaster *et al* [14] conducted a study for 25 years (1941-1965) in western part of India and reported 7,331 cases of esophageal cancer with male: female ratio of 2.6:1 and 1,387 cases of stomach cancer with the male to female ratio was 3.4:1.

Sharma *et al* [15], conducted a study in Chandigarh, North India during a period of 1999-2012, and observed 2186 (23%) of overall registered cases (9603) of carcinomas were G.I cancer with male preponderance.

In a previous study from Mizoram by Phukane *et al* [10] in between 1st January 1997 and 31st December

2002, 2159 cases were diagnosed with G.I malignancy with a male: female ratio of 2.3: 1.

A study from United Kingdom by Sundar *et al* [16] during 1998-2002, reported that out of 11,145 endoscopies performed they identified 228 (2%) upper GI cancers with 130 males, 82 females and M: F ratio of 1.58:1.

Sumathi *et al* [17] conducted a study between January 2004 and June 2005 in south India and a total of 3432 endoscopies were performed where 284 patients (8.3%) had a histology-confirmed malignant lesion with an overall male preponderance among malignancies of GI tract.

Presumably, in the present study the male preponderance could be attributed to the high incidence of tobacco and smoking found among males.

4.2 Age distribution

In present study, upper G.I malignancies, is more in the age group of 41-70 years. There were 43 cases (38%) in patients of 41-50 years, 22 cases (19.4%) of 51-60 years and 25 cases (22%) of 61-70 years. The mean age of patients was 52.21 ± 11.93 years. The mean age for male patients was 51.65 years and for females was 54.39 years. The range of age was 28 years to 85 yrs. In lower G.I malignancies, all 3 patients were above the age of 60 years.

In a similar finding with the present study, Kumar [12] reported the mean age of 52.7 years and Sharma *et al* [15] observed 75 % of the cases were aged between 40-70 years.

Paymaster *et al* [14] reported most patients between 35 to 54 years of age with the average age for male were 52.9 years and for female was 50.8 years. Phukane *et al* [10] reported median age of stomach cancer was 58 years for male and 57 years for female.

Sumathi *et al* [17] reported the overall mean age was 41.6 ± 5yrs. 18.3% of 284 patients with malignancy were between 25 and 45 years of age.

4.3 Site of involvement

In the present study, the most common site of upper G.I malignancy and airway is esophagus comprising of 68 cases (58.1%) out of 113 cases, followed by larynx 22 cases (18.8%), stomach 09 cases (7.6%), pharynx 08 cases (6.8%), pyriform fossa 07 cases (6.1%) and tongue 03 cases (2.5%).

Our observation is similar with previous studies like Paymaster *et al* [14] who reported highest incidence of esophageal cancer (42%) followed by stomach (24%) and intestine (34%). Sharma *et al* [15] also reported highest incidence for cancer of the esophagus. Sundar *et al* [16] found 228 upper GI cancers which includes 119 esophageal (52%) and 109 gastric cancers (48%).

But the study from Mizoram by Phukane *et al* [10] reported stomach cancer cases account for 37.7% of the total neoplasm seen at Aizawl Civil Hospital.

In our study, maximum cases of esophageal malignancies involves the middle third part (63.2%), which is also the most common site of involvement according to the literature.

There is high prevalence of stomach cancer in Mizoram which may be because of more consumption of smoked meat as compared to Meghalaya where most people consumes tobacco and betel nut which leads to high prevalence of esophageal cancer in the state.

Kumar [12] who conducted a study in south India reported maximum incidence of cancer in stomach (50.6%) followed by large intestine (30.6%) and esophagus (15%). Thus suggesting more prevalence of stomach and colon malignancy in South India which may be because of low fibre diet, high consumption of rice, chilli and high-temperature food.

4.4 Risk factors

In the present study, 73 cases (64.6%) consumes tobacco, 74 cases (65.4%) are smokers, 73 cases (64.6%) takes betel nut, 41.5% cases consumes salted & fermented food and smoked meat, 30% takes alcohol and 1.7% had family history of cancer.

Similar finding reported with our study, Paymaster *et al* [14] noted the association of smoking, paan/betel nut and alcohol with esophageal cancers.

Barad *et al* [13] reported association of consumption of dried fermented fish and smoked meat with increased risk of gastric cancer. Lanou *et al* [18] observed that vegetarians have a lower risk of cancer.

Malhotra SL [19] reported the association between betel leaf chewing and all types of cancer of the mouth, tongue, and palate. He also supported the evidence of association between lack of fibre diet and gastric cancer.

Barad *et al* [13] showed 7.6% of patients had a positive family history. Our low estimate of family history could have been because of poor reporting or lack of knowledge of past family medical history

4.5 Clinical presentations

In our study of upper G.I malignancies, dysphagia was the most common symptom present among all the patients. 70 cases (61.9%) presented with dysphagia, 15 cases (13.2%) presented with enlarged lymph node and 11cases (9.7%) presented with hoarseness of voice with or without stridor. Other clinical feature includes dyspepsia, gastric outlet obstruction, space occupying lesion in liver and ascites, hematemesis, throat pain and foreign body sensation in throat and anemia. In Lower G.I malignancies, cases presented with bleeding per rectum, diarrhoea and constipation.

Similar finding with the present study, Sundar *et al* [16] and Sumathi *et al* [17] reported dysphagia was the most common symptom present among all the patients. Others were dyspepsia, unexplained weight loss, persistent vomiting, anemia and GI bleeding.

In the previous study by Kumar [12] and Barad *et al* [13] most patients presented with abdominal pain and dyspepsia.

4.6 Macroscopic appearance

In our study, G.I malignancies most commonly appeared as ulcerative growths followed by Ulceroproliferative, polypoidal and infiltrative growth. Matching with our observation, Kumar [12] reported that gastric malignancies most commonly presented as ulcerative growths (67.7%) followed by fungating (18.4%), polypoid (8.5%) and infiltrative (5.2%) growth.

4.7 Histological type

In present study of upper G.I malignancies, most common type of carcinoma is Squamous cell carcinoma comprising 92% of cases and followed by adenocarcinoma comprising 8% of cases. Among Squamous cell carcinoma, we got maximum cases of moderately differentiated grade comprising 53 cases (47%). Among adenocarcinoma, we got maximum cases of poorly differentiated grade comprising 5 cases (55.5%). In Lower G.I endoscopy cases, the most common malignancy we got is adenocarcinoma.

In our study, Squamous cell carcinoma involved esophagus, larynx, pharynx, pyriform fossa and tongue. Squamous cell carcinoma of the esophagus is the predominant histology in the upper and middle thirds of the thoracic esophagus, whereas Adenocarcinoma predominates in the distal esophagus. On the other hand, adenocarcinoma mostly involved stomach.

Similar finding with our study, Kumar [12] reported majority of the gastric malignant tumors are adenocarcinomas (69.07%).

5. Conclusion

Endoscopy is important diagnostic tool available for the diagnosis of patients suffering from various gastro intestinal ailments. Various gastro intestinal diseases could be diagnosed with greater precision as direct visualization of the site of the lesion as well as the ability for collection of biopsy specimen from upper as well as lower gastrointestinal tract could be made.

In addition to diagnosis, various endoscopic therapeutic modalities is available which further add to its growing popularity and importance and a must have procedure in any medical set up.

Dyspepsia is a common GI symptom; endoscopy should be advised in patients with red flag signs like dysphagia, odynophagia, hematemesis, melaena, hematochezia, altered bowel habit and patients with persistent symptoms especially in the middle aged or elderly patients.

Betel nut, smoking, tobacco and alcohol use remains the important risk factors and every effort has to be made to disseminate the information to all section of population about the harmful effects of these products.

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