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Original Research Article

Pattern of esophageal cancer in tertiary care hospital in North India: a clinicopathological study

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ABSTRACT

Background: Esophageal cancer is one of the deadliest and eighth most common cancer worldwide. It is the sixth most common cause of cancer related deaths with developing nations making up more than 80% of total cases and deaths. The purpose of this study was to assess the histopathological pattern of esophageal cancer in our region.
Methods: In our centre, we analyzed 101 cases of endoscopic esophageal biopsy proven cases of esophageal cancer from January 2014 to June 2016. In most of these cases, dysphagia was the commonest indication of esophageal endoscopy.
Results: 65 cases (64.4%) were males and 36 cases (35.6%) were females. Most of the patients were in the age group of 41-60 years. The histopathological analysis revealed squamous cell carcinoma as the most common esophageal cancer (n=61, 60.4%) followed by adenocarcinoma (n=38, 37.6%) and 02 cases of undifferentiated carcinoma (2%).
Conclusions: Esophageal cancer is one of the commonest digestive tract malignancy in India. The males are affected more than the females with male to female ratio of 1.8:1. The maximum number of cases being seen in fifth and sixth decade of life. The squamous cell carcinoma is the most common esophageal cancer seen, with middle esophagus being the commonest site. However, the number of cases of adenocarcinoma are on rise.

Keywords: Biopsy, Endoscopy, Esophageal cancer, Histopathology

INTRODUCTION

Esophageal cancer is one of the deadliest and eighth most common cancer worldwide. It is the sixth most common cause of cancer related deaths with developing nations making up more than 80% of total cases and deaths.[1] Esophageal cancer affects more than 450,000 people worldwide and incidence is increasing rapidly.[2] Esophageal cancer exhibits distinct epidemiological pattern from other cancers. The incidence of esophageal cancer has been increasing over the past few decades, with a shift from squamous cell carcinoma arising in upper/middle third of esophagus to adenocarcinoma arising in distal esophagus.[3] Predisposing factors for squamous cell carcinoma include high alcohol intake and heavy use of tobacco.[4] Esophageal adenocarcinoma arise most frequently in Barrett's epithelium through a series of progressive degrees of dysplasia, from intestinal metaplasia to low grade dysplasia, high grade dysplasia and subsequently to cancer.[5,6] Despite many advances in diagnosis and treatment, the 5 year survival for all patients diagnosed with esophageal cancer ranges from 15-20%.[2]

Esophageal cancer incidence and histological type is highly variable based upon geographical location. Incidence rates for squamous cell carcinoma of esophagus have been reported as high as 100 cases per 100000 annually in an area referred to as the "Asian esophageal cancer belt" and this region extends from

northeast China to the Middle East.[7] Small cell carcinoma represents 1% of esophageal cancers and affects usually males over 50 years of age. Undifferentiated carcinoma of the esophagus is rare but highly malignant tumour.

The present study was undertaken to evaluate the histopathological pattern of esophageal cancers on endoscopic esophageal biopsies in patients presenting to tertiary care hospital in India.

METHODS

Of all the patients who underwent upper G.I. endoscopy from January 2014 to June 2016, 101 patients were proven esophageal cancer. Dysphagia was the commonest symptom in all such patients.

All specimens obtained were processed routinely and stained with haematoxylin-eosin stain. The special stains like reticulin and mucicarmine were used wherever necessary. The pathological features evaluated in each sample were alteration in cellular architecture, atypical cells, abnormal mitosis and inflammatory as well as granulomatous infiltrates.

RESULTS

Of all the patients who underwent upper gastrointestinal endoscopy, 101 cases were histopathologically proven esophageal cancers from January 2014 to June 2016. The most common indication in all cancer cases to undergo esophageal endoscopy and subsequent biopsy was dysphagia. The histopathological analysis of these specimen showed squamous cell cancer (SCC) as the most common esophageal cancer (Figure 1) followed in frequency by adenocarcinoma (Figure 2) and undifferentiated carcinoma.

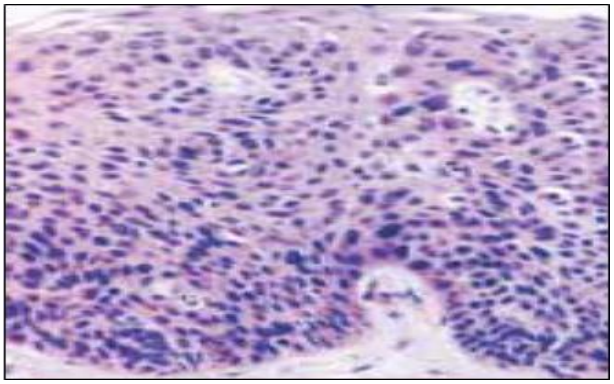

Figure 1: Squamous cell cancer esophagus- well differentiated with lymphoid infiltrates (H and E 40 x 10 X).

Out of 101 cases, 61 cases (60.4%) were Squamous cell carcinomas (SCC), 38 cases (37.6%) were adenocarcinomas and 2 cases (2%) were undifferentiated carcinomas (Table 1). These findings are consistent with study by Pun CB et al.[8]

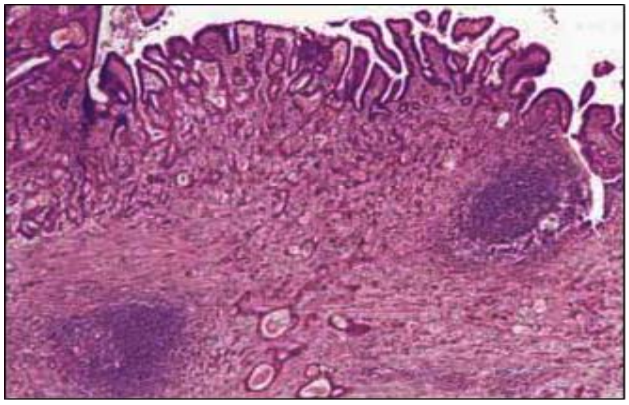

Figure 2: Adenocarcinoma esophagus- poorly differentiated with glandular structures slightly formed. (H and E 40 x 10 X).

Amongst the cases of SCC, well differentiated SCC were 10 cases (16.4%), moderately differentiated SCC were the most common, 45 cases (73.8%) and poorly differentiated were 6 cases (9.8%). Out of 61 cases of SCC, 34 cases (55.7%) were males and 27 cases (44.3%) were females. Among males, 6 cases (17.6%) were well differentiated, 26 cases (76.5%) were moderately differentiated and 02 cases (5.9%) were poorly differentiated. Among females 04 cases (14.8%) were well differentiated, 19 cases (70.4%) were moderately differentiated and 04 cases (14.8%) were poorly differentiated (Table 2).

Table 1: Age and sex distribution of esophageal cancer.

Age in years	Males	Females	Total
≤20	0	0	0
21-40	06 (46.2%)	07 (53.8%)	13 (12.9%)
41-60	32 (68.1%)	15 (31.9%)	47 (46.5%)
61-80	22 (64.7%)	12 (35.3%)	34 (33.2%)
81-100	05 (71.4%)	02 (28.6%)	07 (6.9%)

Table 2: Distribution of histological pattern of esophageal cancer.

Histological pattern	Number of cases	Percentage (%)
Squamous cell carcinoma	61	60.40
Adenocarcinoma	38	37.62
Undifferentiated carcinoma	02	1.98

Out of 38 cases of adenocarcinoma, 29 cases (76.3%) were males and 09 cases (23.7%) were females. The NOS (not otherwise specified) group of adenocarcinomas comprised most of cases, 16 cases (42.1%). In this group, 12 cases (75%) were males and 04 cases (25%) were females. Mucin secreting adenocarcinoma (Figure 3) was seen in 11 cases (28.9%). In this group, 08 cases (72.7%)

were males and 03 cases (27.3%) were females. Intestinal type adenocarcinoma was seen in 05 cases (13.2%) and all cases were males. Papillary adenocarcinoma was seen in 04 cases (10.5%) and all among males. Only 02 cases (5.3%) of signet ring cell carcinoma were seen among females (Table 3).

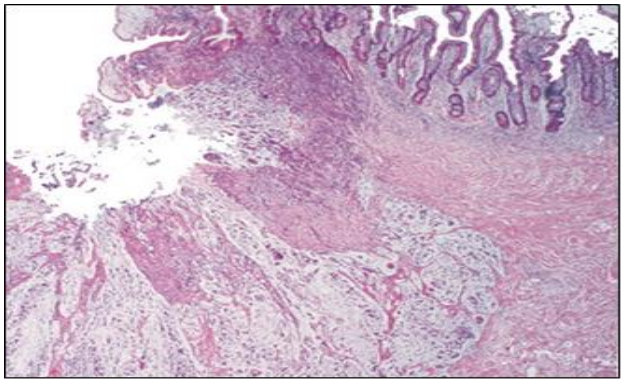

Figure 3: Mucinous adenocarcinoma- large mucinous lakes seen extended throughout the wall (H and E 40 x 10 X).

Table 3: Distribution of squamous cell carcinoma (SCC) among males and females.

	Males	Females	Total
Well differentiated SCC	06 (17.6%)	04 (14.8%)	10 (60.4%)
Moderately differentiated SCC	26 (76.5%)	19 (70.4%)	45 (73.8%)
Poorly differentiated SCC	02 (5.9%)	04 (14.8%)	06 (9.8%)

Age distribution analysis of the cases showed most of them 47 cases (46.5%) in 41-60 years' age group, 34 cases (33.7%) in 61-80 years' age group, 13 cases (12.9%) and 07 cases (6.9%) were in 21-40 years and 81-100 years age group respectively.

Table 4: Distribution of esophageal adenocarcinoma among males and females.

	Males	Females	Total
NOS adenocarcinoma	12 (75%)	04 (25%)	16 (42.1%)
Mucin secreting adenocarcinoma	08 (72.7%)	03 (27.3%)	11 (28.9%)
Papillary adenocarcinoma	04	-	04 (10.4%)
Intestinal type adenocarcinoma	05	-	05 (13.2%)
Signet ring adenocarcinoma	-	02	02 (5.3%)

Out of 47 cases in age group of 41-60 years, 32 cases (68.1%) were males and 15 cases (31.9%) were females. In 61-80 years' age group 22 cases (64.7%) were males and 12 cases (35.3%) were females. A total of 13 cases 06 males (46.2%) and 07 females (53.8%) and 07 cases with 05 males (71.4%) and 02 females (28.6%) were seen in age group of 21-40 years and 81-100 years. No case was seen among 20 years or less. Amongst 101 cases of cancer esophagus 65 cases (64.4%) were males and 36 cases (35.6%) were females. Male to Female ratio was 1.8:1 (Table 4).

DISCUSSION

Esophageal cancer is a serious malignancy with regards to mortality and prognosis. Squamous cell carcinoma is the most prevalent esophageal cancer worldwide, while in certain developed countries like Australia, France, Finland, United States and United Kingdom adenocarcinoma predominates.[9] A drop of 30% in incidence of squamous cell carcinoma is observed in USA between 1973 and 2002, while there is 4-fold increase in adenocarcinoma over the same period.[3] Thus the incidence of esophageal adenocarcinoma is increasing in trends. In India, the extremely high incidence rates of esophageal cancer have been reported from the state of Jammu and Kashmir which seems to fall in the Asian esophageal-cancer belt particularly from Kashmir.[10] The unique personal and dietary habits and environmental factors in Kashmir have been related to this high risk. The high prevalence of esophageal cancer among males have been reported worldwide including India. All the major registries of the world have reported the prevalence of more than 2:1 among males and females. In present study, we found male to female ratio to be 1.8:1 which is at par with the national average reported in previous studies. The high rate of prevalence among Indian females relative to worldwide may possibly be because of betel quid chewing among Indian women.

Preservation of food using nitrosamines has been directly linked with increased incidence of esophageal cancer in the belt from eastern Turkey through north-eastern Iran, northern Afghanistan and southern Russia to northern China.[11] Poor socio-economic status resulting in fewer intake of fruits and vegetables and fish and heavy hookah smoking are suspected to be the major risk factors for the development of esophageal cancer.[12] Drinking hot beverage over a period of time causing thermal injury leading to chronic esophagitis was strongly associated with a higher risk of esophageal cancer.[13] Various studies published previously on very high incidence of cancer esophagus in Kashmir have revealed wide spread contamination by N-nitroso compounds in raw food, salted tea prepared by adding sodium bicarbonate has shown high methanation activity and can cause endogenous formation of nitrosamines.[14] Smoking together with betel quid chewing and alcohol consumption has been shown as a multiplicative risk factor.

In present study, dysphagia was the commonest clinical presentation seen in most of cases followed by persistent

mild retrosternal chest pain and reflux being the next commonest indication for patients to undergo endoscopy. The overall incidence of esophageal carcinoma increases with age, reaching a peak in the seventh decade for squamous cell subtype. Squamous cell carcinoma occurs most commonly in middle esophagus followed by distal and proximal esophagus. The pathogenesis is linked to inflammation of squamous epithelium to dysplasia and in situ malignant change.[15] Adenocarcinoma of the esophagus occurs in the distal esophagus approximately three-fourth of the time with Barrett's esophagus being the most frequent predisposing risk factor.[16] The chronic reflux of gastric acid and bile at gastroesophageal junction and subsequent damage to esophagus has been implicated in the pathogenesis of Barrett's metaplasia (Figure 4).[17]

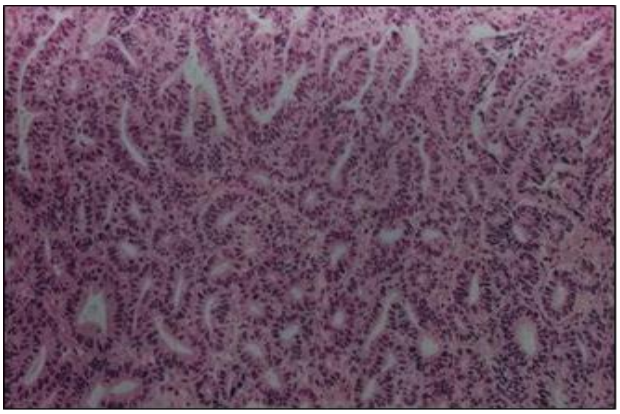

Figure 4: Barret's esophagus- showing complex glandular proliferation (H and E 40 x 10 X).

In present study, out of 101 cases, 47 cases of esophageal cancer comprising 46.5% were seen in fifth and sixth decade of life. Histopathological analysis showed squamous cell carcinoma as the commonest tumour seen in 61 cases (60.4%) with moderately differentiated SCC being the commonest subtype seen in 73.8% of all squamous cell cancers. Adenocarcinoma was the second commonest esophageal cancer seen in 38 cases with not otherwise specified (NOS) adenocarcinoma being the commonest subtype followed in frequency by mucin secreting adenocarcinoma, papillary adenocarcinoma, intestinal type adenocarcinoma and signet ring adenocarcinoma. Only 02 cases of undifferentiated carcinoma were seen.

CONCLUSION

Esophageal cancer is a serious malignancy with incidence of esophageal cancer showing a steady increase over the past few decades. It is one of the commonest digestive tract malignancies particularly in Northern India. The high incidence of esophageal cancer in the state of Jammu and Kashmir has been attributed to distinct dietary habits and environmental factors. The males are affected more than the females. The maximum number of cases being seen in fifth and sixth decade of life in contrast to previous studies where most of cases were seen in seventh and eighth decade. Overall squamous cell carcinoma remains the most common esophageal cancer seen, with middle esophagus being the commonest site however the number of cases of adenocarcinoma is on rise.

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