

Cancer of the esophagus: histopathological sub-types in northern Uganda.

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Abstract

Background: Esophageal cancer is the eighth most common cause of cancer death worldwide with squamous cell carcinoma and adenocarcinoma carcinoma as the main histopathological subtypes. Esophageal cancer is known for its marked variation by geographic region, ethnicity, and gender. Hitherto, the histopathological subtype of this cancer in Northern Uganda were not known. Therefore the aim of the study was to describe the characteristics of esophageal cancer with respect to the histopathologic subtypes, different sites of occurrence, age and gender in this region since its distribution varies with location.

Methods: The study was carried out at Lacor Hospital, in northern part of Uganda. The record of 71 patients who had endoscopic and histopathological diagnosis of cancer of esophagus over a period of 3 years between January 2009 and December 2011 were retrospectively analyzed.

Results: A total of 140 patients had endoscopic diagnosis of cancer of the esophagus and of these, 71 patients had both endoscopic and histopathological diagnosis of cancer of esophagus during the three-year period covered in the study between January 2009 to December 2011. The female to male ratio was 1:3 with mean age of 55.5 years \pm SD 11.8. The common histopathological pattern of cancer of esophagus was squamous cell carcinoma of esophageal consisting of 66 patients (93.0%). The ratio of squamous cell carcinoma to adenocarcinoma was 13:1. The majority of the esophageal cancers were found in the middle third with 38 patients (53.52%), followed by lower third with 27 patients (38.0%) and the upper third which was only 6 patients (8.5%).

Conclusions: Squamous cell carcinoma is the most common histopathological subtype in this geographical location with overall cancer of the esophagus mainly affecting the lower 2/3 of the esophagus with the majority in the middle third.

Key words: cancer of esophagus, histopathological subtypes, Uganda.

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Introduction

Esophageal cancer is the eighth most common cause of cancer death worldwide. There are two main histopathological subtypes; squamous cell carcinoma (SCC) and adenocarcinoma (ADC). Worldwide, SCC is the predominant histological subtype. Adenocarcinoma is mainly a disease of developed countries¹. Squamous cell carcinoma of the esophagus arises from squamous epithelium that undergoes inflammatory, hyperplastic and dysplastic changes whereas adenocarcinoma arises through metaplastic intestinal type changes that replace the squamous epithelium. The incidence of squamous cell carcinoma in black males in the United States (US) is five times higher than that of white male: 18.6 per 100,000 and 3.0 per hundred thousand respectively².

Esophageal cancer is the leading cancer amongst males

in Kenya (90% are squamous cell carcinomas and 10% are adenocarcinomas)³ and is ranked 2nd in Uganda⁴

A unique epidemiological feature of esophageal cancer is its very uneven geographic distribution, with high incidence found within sharply demarcated geographic confines with variation in ethnicity and gender⁵. These geographic 'hot spots' include areas in Northern Iran, Kazakhstan, South Africa, and Northern China⁶, where annual incidence rates can exceed 200 per 100,000⁷. Also both histopathologic subtypes have very different biological and epidemiologic profiles; consequently, esophageal squamous cell carcinoma and esophageal adenocarcinoma should be viewed as separate disease entities. Squamous cell carcinoma primarily occurs in the middle third of the esophagus, while adenocarcinoma predominately occurs in the lower third of the esophagus⁸. Squamous cell carcinoma remains the most common histologic subtype of esophageal cancer worldwide⁹.

The number of patients presenting with esophageal cancer for endoscopy at Lacor Hospital which is the only general Hospital with endoscopy unit in northern Uganda is high. In most of these patients the disease is

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found to be advanced. Also many patients are unable to tolerate the endoscopy because of some discomfort during the procedure since the patients are not sedated but only given lignocaine guggle and hence delays early initiation of treatment. The histopathological subtypes of this cancer in Northern Uganda is not known. These prompted a histopathological review for the different histopathological subtypes (squamous cell carcinoma and adenocarcinoma) with respect to the different sites of occurrence, age and gender which can help in clinical decision and instituting management in case a histopathological diagnosis for the patients is not possible because of inability to tolerate endoscopy. It also helps to determine the different histopathological subtypes of the cancer of esophagus in this geographical region since its distribution varies with location.

Methods

This retrospective analysis included all patients referred to endoscopy unit from both the Hospital's own units and surrounding Hospitals with endoscopic diagnosis of cancer of esophagus between January 2009 and December 2011. The endoscopy was performed in the endoscopic room under lignocaine guggle by surgeons experienced in endoscopy. Hemodynamic stability and resuscitation was performed for sick patients before endoscopy. The sites of tumor was estimated endoscopically with reference point from incisor teeth to gastroesophageal junction and divided into upper third (15-24cm), middle third (25-33cm) and lower third (34-42cm) of the esophagus. Review of the barium swallow images for sites of the tumors was done by the one radiologist to avert the error and bias in recording of endoscopic sites. Biopsies were taken from these tumors

for histopathology and examined by one senior histopathologist and the results were collected to ascertain the different histopathological subtypes (squamous cell carcinoma or adenocarcinoma). Excluded all patients whose histopathology results were not obtained and patients who had tumors involving the gastroesophageal junction with extension to esophagus on either endoscopy or barium swallow or both.

Data obtained from these patients were then recorded according to age, gender, endoscopic diagnosis of esophageal carcinoma and histopathological diagnosis of either squamous cell carcinoma or adenocarcinoma of esophagus. Data was collected using questionnaires and entered on Epi info 7. Statistical data analysis was performed with chi-square. Statistical significance was determined at $p < 0.05$ were necessary.

The study was approved by the department of surgery and the Ethical Research Committee of Lacor Hospital.

Results

A total of 1871 patients underwent upper gastrointestinal endoscopy during the three-year period covered in the study between January 2009 to December 2011. Out of the total number, 140 (7.5%) of the patients had endoscopic diagnosis of cancer of the esophagus and 71 (50.5%) of them had their histopathological results obtained and analyzed. The rest of the patients had their records missing and the patients could not be traced. Of the 71 results analyzed, the female to male ratio was 1:3 with mean age of 55.45 years \pm SD 11.83. (Table 1).

Table 1: Distribution of cancer of esophagus according to age and gender

Gender	Age in years						TOTAL, N(%)
	30 - 39	40 - 49	50 - 59	60 - 69	70 - 79	80 - 89	
Male	3	17	15	10	7	1	53(74.65)
Female	2	3	6	3	4	0	18 (25.35)
TOTAL, N(%)	5(7.04)	20(28.17)	21(29.58)	13(18.31)	11(15.49)	1(1.41)	71(100.00)

Mean age =55.45 \pm SD11.83, Median age = 53, Ratio of Male: Female =2.94:1.00

The common histopathological subtype of cancer of esophagus was squamous cell carcinoma of esophageal consisting of 66 patients (92.96%). The ratio of squamous cell carcinoma to adenocarcinoma was 13:1.

The majority of the esophageal cancers were found in the middle third with 38 patients (53.52%), followed by lower third with 27 patients (38.03%) and the upper third which was only 6 patients (8.45%).(Table2).

Table 2: Distribution of histopathological subtypes of cancer of esophagus by site

Histopathological subtypes	Upper third	Middle third	Lower third	TOTAL, N(%)
Squamous cell carcinoma (SCC)	6	37	23	66(92.96)
Adenocarcinoma (ADC)	0	1	4	5(7.04)
TOTAL, N(%)	6(8.45)	38(53.52)	27(38.03)	71(100.00)

Ratio of SCC: ADC = 13.1:1.0

Discussion

We found that the common age affected by cancer of the esophagus is between 40 to 59 years with mean age of $55.5 \pm SD 11.8$ and a male to female ratio of 3:1. This is similar results of other studies reported in Africa (Malawi, Mozambique, Uganda and Kenya)^{10,11,12,13}, although the male to female ratio in the Kenyan study was 1.5:1. This is attributed to geographical variation in cancer of the esophagus and the incidence. However in the western world the common age group is between 60 to 90 years¹¹. This variation can be explained by the generally old population in the Western world as compared to the Africa.

Squamous cell carcinoma was found to be the most common histopathological subtype in this study with 66 patients (93%) as compared to adenocarcinoma which was only 5 patients (7.1%) with male to female ratio of 13:1. This finding is similar to studies in Kenya³ and others around the world especially among Africans, Hispanics and Native Americans^{14,15,16,17}. This may be explained by the fact that many studies have found out that alcohol consumption and smoking which are also common among the general population in the study group are the main etiological factors of esophageal squamous cell carcinoma both in Western population^{18,19,20,21} and Africa^{3,5,11,12,13}. On the other hand, the very low level of adenocarcinoma in this study may be attributed to the etiology of esophageal adenocarcinoma which is strongly linked to gastro-esophageal reflux disease, Barrett's esophagus and obesity which are not common in the study population as compared to the Western population^{22,23,24,25}. In addition to variations in

the incidence of cancer of the esophagus throughout Africa, the percentage of men may show considerable variation from place to place, though in this study it is similar to the above studies.

Most of the cancers of the esophagus in this study are found in the middle third of the esophagus consisting of 66 patients (53.52%), followed by lower third with 27 patients (38.03%) and the upper third with 6 patients (8.45%). This is not a unique finding to studies from Western world⁸ and one multicentre study in central Africa¹⁰ (Malawi, Mozambique and Rhodesia), in which esophagoscopy was carried out in 337 patients, of whom 17 (5 %) had tumor in the upper third, 190 (56 %) in the middle third and 130 (39 %) in the lower third. However one study in Kenya¹¹ found that, the lower third of the esophagus was the most common location for the tumors, followed closely by the middle third. This variation can be explained by uneven geographic distribution, with high incidence found within sharply demarcated geographic confines with variation in ethnicity and gender of the cancer of the esophagus⁵

The main limitations of the study are the small population size since nearly half the patients had the histopathological results missing. However the results obtained from this study may be adequate to generate evidence based protocols for management of patients with cancer of esophagus since most of the findings are similar with other documented studies around Africa and the Western world. The determination of the site

of the cancer may not be too accurate since the length of the esophagus varies with the height of the individuals. Also the different surgeons though experienced in endoscopy may to some extent have an observer variation.

Conclusion

Squamous cell carcinoma is the commonest histopathological subtype in this geographical location, affecting more males than females. Overall cancer of the esophagus mainly affects the lower 2/3 of the esophagus with the majority in the middle third in this region.

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