

Prevalence of Esophageal Adenocarcinoma

Daniel Ojuka, Keith Dindi, Mark Awori

School of Medicine, University of Nairobi

Correspondence to: Dr. Daniel Ojuka, P.O. Box 19762 – 00202, Nairobi, Kenya. Email: danielojuka@gmail.com

Abstract

Background: There has been a marked increase of the prevalence of adenocarcinoma of the esophagus across the globe, with the risk factors including gastroesophageal reflux disease (GERD) and Barrett's esophagus. It is not known whether the trend is similar locally. **Objective:** To describe the prevalence and clinicopathological characteristics of adenocarcinoma of the esophagus at Kenyatta National Hospital (KNH). **Methods:** This was a cross sectional descriptive study of patients presenting with dysphagia at the surgical outpatient unit and the Endoscopy Unit by consecutive sampling. The patients' demographic and clinical data were obtained using a structured questionnaire. The findings at endoscopy including site of tumour and histopathological findings were recorded. The data was analyzed using SPSS version 22.0. The histological subtypes were presented as a proportion.

Results: A total of 74 patients were recruited. The mean age at diagnosis of esophageal cancer was 57.7 years. The mean duration of symptomatology was 4.5 months, with 66.2% of the patients presenting with wasting at diagnosis. The prevalence of adenocarcinoma amongst esophageal tumours was 18.9%. **Conclusion:** There is increasing occurrence of adenocarcinoma, demonstrating a higher rate than a decade earlier. Further studies are needed to elucidate the risk factors locally.

Key words: Prevalence, clinicopathological features, adenocarcinoma, Oesophagus

Ann Afr Surg. 2017;14(2):***

DOI:<http://dx.doi.org/10.4314/aas.v14i2>.*

© 2017 Author. This work is licensed under the Creative Commons Attribution 4.0 International License.

Introduction

Esophageal cancer is one of the common malignancies worldwide, with clearly defined endemic regions (1). These regions include China, Iran and some parts of France, Southern and eastern Africa (2). Kenya is one of the countries with high prevalence rates, with this cancer being the leading single site of malignancies in men and the third in women (3-5). It is a deadly cancer with very poor overall 5-year survival rates of 18% (1). survival rates of 18% (1).

There are two main histological subtypes of carcinoma of the esophagus; squamous cell carcinoma (SCC) and adenocarcinoma. For many years, squamous cell carcinoma has been the commonest subtype across the world. However, in the last four decades there has been a dramatic rise in the incidence of adenocarcinoma of the esophagus, especially in the western countries (6-9). This has been attributed to certain risk factors including obesity, gastroesophageal reflux disease (GERD) and

diet (7-9). It is not known whether there have been similar changes in the incidence in Kenyan populations, especially given that there has been a steady adoption of western lifestyles with accumulation of similar risk factors. Previous studies done since the sixties have mainly been retrospective in nature. This study sought to evaluate the prevalence and clinicopathologic features of adenocarcinoma of the esophagus among patients presenting with esophageal cancer at the Kenyatta National Hospital.

Methods

This was a cross-sectional descriptive study carried out at Kenyatta National Hospital (KNH) Endoscopy Unit and Surgical outpatient clinics from March 2014 to December 2014. The study population constituted patients who are over 18 years with dysphagia sent for upper gastrointestinal endoscopy at the surgical outpatient clinics and Endoscopy unit in KNH who had

who had a biopsy results. We excluded patients with prior surgery for cancer of the esophagus. Patients were recruited via consecutive sampling. Informed consent was then obtained, following which the second author reviewed the patient’s history and sought for any significant physical finding. Endoscopic findings were then recorded. Endoscopy and biopsy were performed by the physician endoscopist of KNH and University of Nairobi. Data was obtained using a pre-designed data extraction sheet. Data collected included age, sex, presenting symptoms, smoking or alcohol use, duration of symptomatology, body mass index (BMI) and treatment with antacids. Wasting was defined as BMI less than 20. Endoscopy findings recorded included level of tumor and any evidence of Barrett’s esophagus. Any tumor below 40cm from the incisors were excluded from the study.

Histopathological data recorded included histological type of tumor and the tumor grade and any special features including any signet ring or adenosquamous types. The histopathology was performed by the KNH and University of Nairobi (UON) pathologist (10 in number) who all have experienced of more than 5 years in the routine manner. Routinely the histopathological slides are read by at least two pathologists before results are released. At the end of data entry, analysis was performed using SPSS version 22. The study population was described by summarizing categorical data including sex, type of tumour and histological grade into proportions while continuous data such as age and duration of symptoms have been summarized into means and medians. The study was approved by the institutional review board of Kenyatta National Hospital and University of Nairobi.

Results

A total of 74 patients were recruited in the study. The majority (78.4%) were male with male female ration of 3.6:1. The youngest patient was 34 years old and the oldest patient was 88 years old. The mean age was 57.72 (SD +/- 11.76) years. There were 14 (18.9%) adenocarcinoma and 60 (81.1%) squamous cell carcinoma. Half of the patients had a positive history of epigastric pain. However, the adenocarcinoma subset had a higher percentage (78.6%) of patients presenting with epigastric pain compared to the squamous cell carcinoma group (43.3%) (Table 1).

Table 1: Histopathological type and epigastric pain

	Tumor histopathological type		Total	
	Squamous cell carcinoma	Adenocarcinoma		
History of epigastric pain	Yes	26	11	37
	NO	34	3	37
Total	60	14	74	

The p value was 0.02 on Fisher’s Exact test. Majority (58.1%) of the patient had no history of antacid use, with 83.9% of the patients with history of epigastric pain having a positive history of antacid use. There was a positive association between antacid use and adenocarcinoma as the tumor subtype (p value 0.05 on Chi-square test). Forty-three respondents had a history of smoking, majority (40) being males. Seventy-three percent of the patients had a history of alcohol use; 82.8%% of the males and 37.5% of the females. Only 2.7% of the subjects had a family history of esophageal cancer. Most of the tumors occurred in the middle and lower thirds of the esophagus. With regard to the tumor levels, all of the adenocarcinomas were demonstrated more distally (below 35cm from the incisors with only one occurring at 30cm). The mean duration of symptoms before diagnosis was 4.53(SD=2.45) months, with a range of 1month to 12months for all the esophageal cancers. There was no significant difference between the means in either gender. Majority (66.2%) presented with (BMI) of less than 20 at diagnosis, with similar distribution in both histological subtypes. Majority of the patients presented with grade III dysphagia (Figure 2)

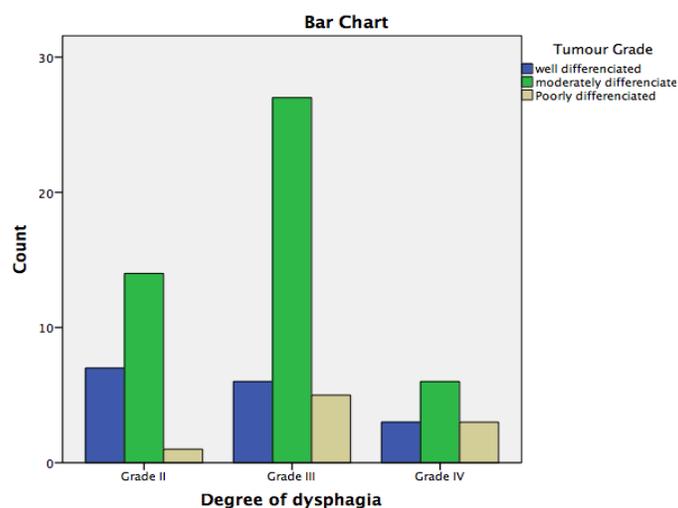


Figure 2: Degree of dysphagia
Moderately differentiated carcinoma was the most common tumor grade, representing 63.5% of all the

tumors, while well differentiated was 22.2% and poorly differentiated were 12.5%. Adenocarcinomas had a higher percentage of well differentiated tumors (42.9%) and no poorly differentiated adenocarcinomas were recorded.

Discussion

The male to female ratio of 3.6:1 in this study is similar to a study done in Ghana, which had a ratio of 4:1(10). However, a study done at the Moi Teaching and Referral Hospital (MTRH) found a male to female ratio of 1.4:1. These wide variations in the ratio have been well documented for tumors of the esophagus in different geographical regions (11). The higher incidence in males could partly be explained by the fact that more males are exposed to the known risk factors like smoking and use of alcohol than the females. In this study, 72.4% of the male patients had a history of smoking, compared to only 6.3% of females and alcohol was seen in 82.8% for males and 32.5% for females. The mean age at diagnosis was 57 years, which correlates closely with mean age found at MTRH of 56 years (12). The study in Ghana had a mean age of 57.8, while a study done in Tanzania got a mean age of 47(10,13). In the western populations, the age at diagnosis is higher, with statistics from the United Kingdom indicating that more than 42% of the patients are 75 years or older at diagnosis. This could be related to life expectancy that is higher in the western world as compared to the Africa. The mean duration of symptomatology was 4.5 months which could explain the more severe degrees of dysphagia noted in the study. Mabula et al. in their Tanzanian study found a mean duration of symptomatology of 4 months, which is similar to this study (13). Majority (69%) of the patients had grade III or IV dysphagia, which correlates with advanced disease. This delay in seeking medical help could also explain why 66.2% of patients were wasted at diagnosis. The delay could be as a result of low socioeconomic status and the cost of investigation and care of esophageal cancer. The prevalence of adenocarcinoma of the esophagus amongst all the esophageal tumors was 18.9%. This rate is significantly higher when compared to previous studies done in Kenya. A retrospective study done in 1978 found the adenocarcinomas to represent 1.1%(14), while in MTRH a prevalence of 7.5% was noted(12). A study

done in Tenwek, Bomet district found a rate of 5%(3). There has been a steady rise in the prevalence of adenocarcinoma of the esophagus worldwide, with the western populations recording up to 400% rise in incidence in some countries (6). This has been attributed to Barrett's esophagus and obesity among other factors (6). These factors were not elucidated in this study. However, the change in lifestyle resulting in obesity and other risk factors for Barrett's esophagus could partly explain this trend. Further studies powered to detect risk factors are needed to fully explain this phenomenon. The patients with adenocarcinoma of the esophagus had a significantly higher history of both epigastric pain and use of anti-acid medications. Majority (78.6%) of the patients with adenocarcinoma of the esophagus had history of epigastric pain compared to the SCC group which had 43.3%. This difference was statistically significant at p value 0.018. This could be due to gastroesophageal reflux disease which causes epigastric pain and is a recognized risk factor to Barrett's esophagus and adenocarcinoma of the esophagus. In keeping with the proposed pathophysiology of adenocarcinoma of the esophagus, majority of the adenocarcinoma were in the lower esophagus, which involves metaplasia of the distal esophagus due to chronic irritation caused by GERD (15). The prevalence of GERD in Kenya is not known, thus it is difficult to explain its impact on adenocarcinoma of the esophagus locally. As indicated earlier, Barrett's esophagus is associated with metaplasia to adenocarcinoma and that could explain this rise but this study did not elucidate presence or absence of Barrett's esophagus (6,12,14). There was a statistical difference in grade between adenocarcinomas and SCC with greater number of well differentiated being adenocarcinoma (p value 0.032). There was no association of the tumor grade and the level of tumor. This is in contrast to an observation made by Gatei et al, who noted that poorly differentiated carcinomas tended to be more in the lower third of the esophagus (14). One limitations of this study was that the endoscopies were done by different individuals, thus there may be some inconsistencies in reporting of certain parameters that are observer dependent, e.g level of tumor.

Conclusion

The study demonstrated a prevalence of adenocarcinomas of the esophagus at 18.9% amongst all esophageal tumors. This rate is higher than that demonstrated in studies done in previous decades, which is in keeping with trends observed in other regions of the world. Most of the patients present late with severe degrees of dysphagia, with wasting seen in 66.2% of them. Majority of the adenocarcinomas were moderately differentiated. In view of the above findings; further studies are needed to elucidate the risk factors to adenocarcinomas of the esophagus locally. Clinicians are encouraged to have a higher index of suspicion and send patients presenting with epigastric pain or early dysphagia for endoscopy. A similar study to be done in other regions of the country to assess if the same pattern is observed, thus determining if this is a countrywide phenomenon.

References

1. Siegel RL, Miller KD, Jemal A. Cancer Statistics, 2016. *CA Cancer J Clin.* 2016 Jan 1;66(1):7–30.
2. Ahmed N, Cook P. The Incidence of Cancer of the Oesophagus in West Kenya. *Br J Cancer.* 1969;23:302–12.
3. White RE, Abnet CC, Mungatana C K. et al. Esophageal Cancer. A Common Malignancy in Young People of Bomet District, Kenya. *Lancet* 2002;360: 462-63
4. Robert KP, Sanford MD, Christian CA. Frequent Occurrence of Esophageal Cancer in Young People in Western Kenya. *Dis Oesophagus.* 2010; 23(2): 128–35.
5. Mao W-M, Zheng W-H, Ling Z-Q. Epidemiologic Risk Factors for Esophageal Cancer Development. *Asian Pac J Cancer Prev.* 2011;12(10):2461–6.
6. Brown LM, Devesa SS, Chow WH. Incidence of Adenocarcinoma of the Esophagus among White Americans by Sex, Stage, and Age. *J Natl Cancer Inst.*2008;100:1184–87
7. Vizcaino AP, Moreno V, Lambert R et al. TimeTrends Incidence of Both Major Histologic Types of Esophageal Carcinomas in Selected Countries, 1973–1995 *Int J Cancer* 2002;99:860–8
8. Cook MB, Chow WH, Devesa SS. Esophageal Cancer Incidence in the United States by Race, Sex, and Histologic Type, 1977–2005. *Br. J. Cancer* 2009;101:855–9
9. Hongo M. Review article: Barrett's Esophagus and Carcinoma in Japan. *Aliment. Pharmacol. Ther.*2004;20:50–4.
10. Mark T, Frank E, Ernest A, et al. The Changing Epidemiology of Esophageal Cancer in Sub-Saharan Africa – The Case of Ghana. *The Pan African Medical Journal.* 2012;13:6
11. Zhang Y. Epidemiology of Esophageal Cancer. *World J of Gastroenterol* 2013;14;19(34):5598-606.
12. Patel K, Wakhisi J, Mining S, et al. Esophageal Cancer, the Topmost Cancer at MTRH in the Rift Valley, Kenya, and its Potential Risk Factors. *ISRN Oncology*, vol. 2013, Article ID 503249, 9 pages, 2013. doi:10.1155/2013/503249
13. Mabula D, Rambau F, Phillip L. Endoscopic and Clinicopathological Patterns of Esophageal Cancer in Tanzania: Experiences from Two Tertiary Health Institutions. *World J SurgOncol.* 2013; 11:257
14. Gatei DG, Odhiambo PA, Orinda DA, et al. Retrospective Study of Carcinoma of the Esophagus in Kenya *Cancer Res.* 1978;38:303-7
15. Lagergren J, Bergstroöm R, Lindgren A, et al. Symptomatic Gastroesophageal Reflux is a Strong Risk Factor for Esophageal Adenocarcinoma. *N Engl J Med* 1999;340:825–31.