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Gender differences in esophageal cancer in Sudan: A retrospective study.

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ABSTRACT— Carcinoma of the esophagus is a common disease with high morbidity and mortality. There rate is increasing in sub-Saharan and East Africa, literature is scarce in Sudan. This study aimed to assess gender differences in esophageal carcinoma in Sudan. This retrospective study was conducted at the endoscopy unit in Omdurman Teaching Hospital, Sudan during the period from September 2021 to April 2022. The patients' records from January 2017 to December 2019 were approached. A checklist was used to collect the demographic factors, the presenting symptoms, social and dietary habits; the associated factors including anemia, achalasia, and esophageal refluxing in addition to histopathology findings. Out of ninety-three patients with esophageal cancer, (57% were women who were younger than men, 95% CI, 0.74-12.5), mean age, 63.82±14.43 years, and Western Sudan reported the highest prevalence (34.4%). Homemakers and farmers were the commonest, 53.8% and 31.2% respectively. The commonest presenting symptom was dysphagia (96.8%), 74.2% were anemic, smoking was observed in 9.7%, 32.3% used to consume hot food and 16.1% consume spicy food, and 40.9%) had reflux esophagitis and achalasia was found in 24.7%. Smoking was commoner among males (95% CI, P-value, 0.027), with no differences between gender regarding spicy food, hot food, reflux esophagitis, achalasia, and histopathological type, P-values > 0.05. The commonest presenting symptoms were dysphagia and loss of weight, homemakers were most likely affected, spicy food, reflux esophagitis were the most common risk factors, and adenocarcinoma is more common. Smoking was common among males; no differences were evident regarding other factors.

KEYWORDS: Gender differences, esophageal cancer, Sudan

1. INTRODUCTION

Esophageal cancer increased dramatically in the developed world in the past few decades, the disease is one of the fatal illnesses with a high rate of mortality (10% five-year survival). The high mortality rate might be because the disease is salient and usually advanced at the diagnosis [1]. Esophageal cancer is ranked the number eight cause of cancer and the sixth cause of cancer-related mortality, the distribution varied widely worldwide (high in China and Japan). Screening is useful in an area with a high incidence of squamous cell carcinoma. However, the role of early detection of adenocarcinoma in Barrett's esophagus is controversial [2]. The annual cancer risk among patients with non-dysplastic Barrett's esophagus is very low, in addition, depending on the degree of dysplasia the incidence varies from 1% to 5% [3]. However, the majority of adenocarcinoma are detected among patients without Barrett's esophagus [4]. People with chronic gastroesophageal reflux and additional risk factors might be candidates for screening, but two out of five patients with adenocarcinoma are free from gastroesophageal reflux [5]. Improved imaging techniques and therapeutic advances substantially improved the prognosis in selected patients. The areas with the highest

prevalence are the Asian Belt (Iran, Kazakhstan, Turkey, and China) and Southeastern Africa, squamous cell carcinoma is predominant in these areas in contrast to the observation in the United States, Western Europe, and the United Kingdom in which adenocarcinoma was common [6], [7]. Smoking, ethanol consumption, nitrosamines, low socioeconomic class, and hot beverages are the major risk factor for squamous cell carcinoma, while smoking, obesity, and vitamin and folate deficiencies increased the risk of adenocarcinoma [8]. In Sudan, the situation is more alarming, esophageal carcinoma is the fifth in women and forth-in men, and genetic and environmental factors are to blame [9]. Teeth loss, sociodemographic factors, and smoking are the major risk factors. The disease is usually presented late due to the poverty of screening and diagnostic tests in particular in outreach areas with poor healthcare facilities [10]. Esophageal cancer is the commonest gastrointestinal cancer and causes a lot of morbidity and mortality in Sudan [11]. This study aimed to assess gender differences in the clinical presentation, risk factors, and histological type of esophageal cancer in Sudan.

2. Subjects and methods

This retrospective study was conducted at an endoscopy center in Omdurman; all the patients' records from 2017 to December 2019 were approached. A checklist was used to collect the demographic factors including age, gender, occupation, and residence. The presenting symptoms including dysphagia, cough, hoarsens, and chest pain were recorded in addition to social and dietary habits, the associated factors including anemia, post cricoid web, achalasia, obesity, and esophageal reflux were reported when present in addition to the endoscopy and histopathology findings.

Ethical issues:

The data were approached confidentially and privacy was insured according to the Helsinki Declaration.

Ethical clearance was obtained from the endoscopy unit of Omdurman Teaching Hospital to conduct this research.

Statistical analysis:

The data were entered into a master sheet, and the Statistical Package for Social Sciences (SPSS), version 20, New York was used for data analysis. The Chi-square was used to compare age, smoking, hot and spicy food, reflux esophagitis, achalasia, and histopathology of esophageal cancer across gender, while the one-way Sample T-test was used for age comparison. A P-value of < 0.05 was considered significant.

3. Results

In the present study, 57% of patients with esophageal cancer were women, the mean age of the patients was 63.82±14.43, and Western Sudan reported the highest esophageal cancer rate (34.4%), followed by Khartoum State (22.6%) and Central Sudan (2.4%). Homemakers and farmers were the commonest, 53.8% and 31.2%. Table 1.

The most common presenting symptoms were dysphagia, loss of weight, and chest pain in 96.8%, 89.2%, and 54.8%, these results imply that the patients presented later to the hospital. In the present study, more than two-thirds were anemic (74.2%), smoking was observed in 9.7%, 32.3% used to consume hot food and 16.1% consume spicy food. Nearly half of the patients (40.9%) had reflux esophagitis and achalasia was found in 24.7%. Table 2.

In the present study, smoking was commoner among males (95% CI, 0.04-0.94, P-value, 0.027), with no differences between gender, spicy food (95% CI, 0.27-2.54, P-value, 0.755), hot food (95% CI, 0.34-1.92,

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P-value, 0.623), reflux esophagitis, (95% CI, 0.55-2.96, P-value, 0.567), achalasia, (95% CI, 0.37-2.52, P-value, 0.958), and histopathological type, (95% CI, 0.31-1.94, P-value, 0.581). Table 3.

It is interesting to note that, women with esophageal cancer were younger (60.98±13.62 versus. 67.6±14.77), 95% CI, 0.74-12.5, P-value, 0.028. Table 4.

Table 1. Basic characteristics of Sudanese patients with esophageal cancer

Age	63.82±14.43
Female	53 (57%)
Residence	
Western Sudan	32 (34.4%)
Khartoum	21 (22.6%)
Northern Sudan	16 (17.2%)
Central Sudan	19 (20.4%)
Eastern Sudan	05 (5.4%)
Occupation	
Housewives	50 (53.8%)
Farmer	29 (31.2%)
Employee	04 (4.3%)
Other	10 (10.8%)

Table 2. Symptoms and risk factors among patients with esophageal cancer in Sudan.

Character	No %
Dysphagia	90 (96.8%)
Loss of weight	83 (89.2%)
Chest pain	51 (54.8%)
Cough	50 (53.8%)
Hoarse voice	17 (18.3%)
Anemia	69 (74.2%)
Smoking	09 (9.7%)
Spicy food	15 (16.1%)
Hot food	30 (32.3%)
Reflux esophagitis	38 (40.9%)
Achalasia	23 (24.7%)
Histology	67 (72%)

*__Table 3.__ The association of sex with smoking, spicy and hot food, reflux esophagitis, and achalasia among patients with esophageal cancer in Sudan.

Character	Males	Females	95% *CI*	P-value
Smoking	07 (17.5%)	2 (3.8%)	0.04-0.94	0.027
Spicy food	07 (17.5%)	08 (15.1%)	0.27-2.54	0.755
Hot food	14 (35%)	16 (30.1%)	0.34-1.92	0.623
Reflux esophagitis	15 (37.5%)	23 (43.4%)	0.55-2.96	0.567
Achalasia	10 (25%)	13 (24.5%)	0.37-2.52	0.958
Histology	30 (75%)	37 (69.8%)	0.31-1.94	0.581

*Chi-square test

*Table 4. The age among males and females with esophageal cancer in Sudan

Character	Males	Females	95% *CI*	P-value
Age	67.6±14.77	60.98±13.62	0.74-12.5	0.028

*One-way Sample T-test

4. Discussion

The incidence of esophageal cancer jumped from 1.4% in the seventies of the last century to 9.6% in all cases referred for endoscopy in Central Sudan [11]. The north of Sudan bears the most burden of esophageal cancer in Sudan with elderly males being most commonly affected [12]. In the present study, females were slightly more than males in contradiction to studies conducted in Africa in which males were more affected than females [13]. However, our findings of the predominance of women supported [14] from central Sudan who found a male/female ratio of 1:1.8. Other African countries including Ethiopia and Mozambique showed similar findings, the differences in sample size might explain the contradiction, gender inequality, and referral bias is another plausible explanation [15]. In the current data, the absence of male abundance in our sample cannot be explained by the traditional risk factors including smoking, spicy and hot food, reflux esophagitis, and achalasia that showed no significant differences across gender. Environmental chemical exposures are higher for women who stay cooking indoors for a long time without ventilation [16]. In the present study, the majority of patients with esophageal cancer were homemakers and farmers supporting previous observations in Africa in which low socioeconomic status was associated with esophageal malignancy [17], [18]. The first published studies in Sudan by [19], [20] showed no differences in gender incidence while Mohammed and colleagues showed an abundance of women, these results imply that there are female-specific factors that increase esophageal cancer or there is referral bias. Females are more likely to seek medical advice than males. In the present study, the majority of the patient presented with dysphagia and had anemia indicating an advanced disease and high mortality. The current findings are in line with [14]. Gasmelseed and colleagues reported a higher smoking habit among males in agreement with our findings. Anemia might predispose to esophageal cancer or a result from dysphagia, in this study, 74.2% had anemia. The present data showed that females are younger than males with a significant statistical difference, similarly, [21] observed that females were younger. Hot and spicy food is associated with esophageal cancer [22- 24], in this study, hot and spicy food was found in 30.1% and 15.1% respectively. Achalasia and reflux esophagitis is associated with inflammation and adenocarcinoma; in addition, achalasia is also linked to squamous cell carcinoma [25], [26]. The high rate of adenocarcinoma in the present study might be related to the high prevalence of reflux esophagitis and achalasia with no differences between men and women [27]. The high rate of adenocarcinoma in this study is in line with trends toward increasing incidence in the developed world [28].

The retrospective nature, the small sample size, and the fact that the study was conducted at a single tertiary center are major limitations.

5. Conclusion

The commonest presenting symptoms were dysphagia and loss of weight, homemakers were most likely affected, spicy food, reflux esophagitis were the most common risk factors, and adenocarcinoma is more common. Smoking was common among males; no differences were evident regarding other factors.

Conflicts of interest: The authors declare that there are no conflicts of interest.

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