ORIGINAL ARTICLE

Epidemiological, clinical, histological and post-surgical characterization of patients diagnosed with esophageal cancer

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ABSTRACT

Introduction: esophageal cancer is originated in the esophageal mucosa and is expanded towards the muscular layer and the adventitia as it is growing. Depending on the type of cell in which it originates, there is epidermoid carcinoma or squamous cell carcinoma and adenocarcinoma.
Objective: to describe the epidemiological, clinical, histological and post-surgical characteristics of patients diagnosed with esophageal cancer operated at the "Arnaldo Milián Castro" Hospital.
Methods: a descriptive, prospective longitudinal study was carried out from January 2010 to December 2021. The study population consisted of 71 patients.
Results: 58 patients (81.6%) were male and the most frequent ages ranged from 60 to 69 years. Smoking and alcohol consumption were the most frequent risk factors. Two patients had no known risk factors. Infectious (49.3) and surgical (36.6%) complications predominated. Fifty-one patients (71.8%) were discharged alive.
Conclusions: male sex and age group 60-69 years predominated, smoking was the most prevalent risk factor and dysphagia was the cardinal symptom. The most affected esophageal segment was the middle third, with histological diagnosis of squamous cell carcinoma. Infectious complications predominated, with a mean hospital stay of 10 to 19 days. Most patients were discharged alive.
Keywords: esophageal neoplasms; epidemiology; signs and symptoms; risk factors; postoperative period

RESUMEN

Introducción: el cáncer esofágico se origina en la mucosa del esófago y se expande hacia la capa muscular y la adventicia en la medida que se produce su crecimiento. En dependencia del tipo de célula en la que se origine tiene lugar el carcinoma epidermoide o carcinoma de células escamosas y el adenocarcinoma.
Objetivo: describir las características epidemiológicas, clínicas, histológicas y postquirúrgicas de pacientes con diagnóstico de cáncer de esófago operados en el Hospital "Arnaldo Milián Castro".

Métodos: se realizó un estudio descriptivo, longitudinal prospectivo, en el período de enero de 2010 a diciembre de 2021. La población de estudio estuvo conformada por 71 pacientes.
Resultados: 58 pacientes (81,6%) fueron del sexo masculino y las edades más frecuentes oscilaron entre los 60 y los 69 años. El hábito de fumar y el consumo de alcohol fueron los factores de riesgo más frecuentes. Dos pacientes no tenían factores de riesgo conocidos. Las complicaciones infecciosas (49,3) y las quirúrgicas (36,6%) predominaron. Egresaron vivos 51 pacientes (71,8%).
Conclusiones: predominó el sexo masculino y el grupo etario de 60 a 69 años, el hábito de fumar fue el factor de riesgo que más prevaleció y la disfagia el síntoma cardinal. El segmento esofágico más afectado fue el tercio medio, con el diagnóstico histológico de carcinoma epidermoide. Predominaron las complicaciones infecciosas, con una estadía hospitalaria media de 10 a 19 días. La mayoría de los pacientes egresaron vivos.
Palabras clave: neoplasias esofágicas; epidemiología; signos y síntomas; factores de riesgo; periodo posoperatorio

INTRODUCTION

Esophageal cancer is one of the most aggressive rare malignancies affecting the upper digestive tract. It originates in the esophageal mucosa and spreads towards the muscular and adventitial layer as it increases in size. Depending on the type of cell in which it originates there is epidermoid carcinoma or squamous cell carcinoma, which is formed in the squamous cells lining the organ and is located in the middle and upper part; adenocarcinoma begins in the glandular cells and is located in the lower part or at the esophageal-gastric junction.[1,2]
It constitutes one of the neoplasms with the worst prognosis due to its late diagnosis because the distensibility of the wall of this organ leads to the clinical manifestations not appearing until the disease is locally advanced and affects 60% or more of its circumference.[3]
On a worldwide scale, among the main risk factors related to its appearance are age over 50 years, male sex, inadequate diets, alcohol consumption and smoking; due to the importance of these factors, it has been suggested that both alcohol and cigarette smoking are the major etiological factors of esophageal carcinoma and that, when they are combined, they tend to increase the risk from 25 to 100 times more.[3]
Other risk factors predisposing to the development of this neoplasm are obesity, tylosis or palmoplantar keratoderma, Plummer-Vinson syndrome, caustic esophagitis, esophageal achalasia, human papillomavirus infection, celiac disease, head and neck tumors, and Barrett's esophagus, the latter poses a 30 to 125 fold risk of progression to adenocarcinoma and results from long-standing gastroesophageal reflux disease leading to reflux esophagitis and then replacement of the squamous epithelium of the distal esophagus with a columnar-type (Barrett's) epithelium.[3,4]
Esophageal cancer is currently one of the most serious public health problems in the world. It is an aggressive tumor that is usually diagnosed in advanced stages and represents the eighth most frequently diagnosed malignant neoplasm worldwide, with 456 thousand new cases per year.[5]
The prognosis is related to tumor stage, the existence of distant metastases, lymph node involvement and parietal invasion.[1]

Its incidence varies widely geographically, with Asia and Central and South Africa being considered high frequency areas (more than 100 cases per 100,000 inhabitants/year). In Europe, the highest incidence rates are found in Russia, France, the United Kingdom and Ireland. Spain is, with respect to the rest of Europe, at an average incidence rate (approximately 8/100,000 men and 1/100,000 women). According to the 2019 report of the Spanish Society of Medical Oncology, the incidence of esophageal cancer in Spain is 2 353 cases (82.3% in males) and accounts for 0.85% of all cancers and the thirteenth of solid tumors in order of frequency in males and the seventeenth in females. Mortality is 1,850 cases per year which corresponds to 1.63% of cancer deaths and ninth in order of frequency of solid tumors in males and eighteenth in females.[6]

Its frequency is higher in men than in women and surgical treatment does not follow a uniform criterion in all hospitals. The most frequent techniques are adjuvant treatment, subtotal esophagectomy with esophageal substitution, anastomosis and lymph node dissection, all depending on the stage of the cancer and the area of involvement. Among the most frequent complications after surgical treatment are cervical anastomosis fistula, pneumonia and wound infection.[7]

Its two forms of presentation are very aggressive, which makes esophageal neoplasia one of the lowest survival rates, with 1% in five years, and it has been described that the life span, if diagnosed at an advanced stage, is between five and seven months.[2,8]

The two most frequent histological types are adenocarcinoma and squamous cell carcinoma or squamous cell carcinoma. Both histological types are presented as two independent diseases, with differences in their epidemiology, pathogenesis, tumor biology, and evolution.[9]

Taking into account that it is one of the most aggressive neoplasms of the digestive system, with an overall survival at five years of less than 10% and that its poor prognosis is due to late diagnosis, this study was carried out with the aim of describing the epidemiological, clinical, histological and surgical characteristics of patients diagnosed with esophageal cancer operated on at the "Arnaldo Milián Castro" Hospital.

METHODS

Design and population

A descriptive, prospective longitudinal study was carried out at the University Clinical Surgical Hospital "Arnaldo Milián Castro" of Santa Clara City, Villa Clara Province, from January 2010 to December 2021.

It was studied the entire population (71) of patients who underwent surgery at the institution with the diagnosis of esophageal cancer and who underwent esophagectomy during the period from January 2010 to December 2021.

Study variables

The variables taken into account were: age groups, sex, risk factors, clinical symptoms, tumor location, histologic diagnosis, complications, hospital stay and patient status at discharge.

Procedure, data collection and management

Throughout the research, an exhaustive bibliographic review was carried out on the research topic; data collection was performed through the review of individual clinical histories (based on the Data Collection Guide prepared by the author) and hospital statistical records (databases of the Intensive Care Unit and the Department of Pathology, as well as the Hospitalization Register of the Department of Statistics). An Access database was created that included the variables to be studied.

Statistical analysis

The SPSS program version 20.0 for Windows was used for the statistical analysis. Absolute value and percent were used as summary measures of the variables. To explore the relationship between two categorical variables, the nonparametric Chi-square test of independence with Fisher's correction and the strength of association with Cramer's V were used. A confidence level of 95 percent was set for which if the statistical significance was less than 0.05 the null hypothesis was rejected and a significant relationship was inferred. The results were presented in text, tables and statistical figures.

Ethical considerations

Prior to the research, authorization was requested from the Teaching Department of the "Arnaldo Milián Castro" Hospital to carry out scientific research. It was explained that this research is very important and necessary to learn about the problems and establish health actions aimed at improving the quality of life of patients, and a commitment was made that the data obtained would be handled with discretion and professionalism, under the rules set forth in the Declaration of Helsinki, respecting the bioethical principles of Autonomy, Beneficence, Non-maleficence and Justice.

RESULTS

The investigation included a total of 71 patients, with predominance in the age group 60-69 years (40.8%), followed by 50-59 years (39.4%), and male sex (58, 81.7%) -Table 1.

Table 1. Distribution of patients by age and sex

Age groups	Gender				Total	
	Masculine		Feminine			
	No.	%	No.	%	No.	%
30 - 39	1	1.4	1	1.4	2	2.8
40 - 49	9	12.7	2	2.8	11	15.5
50 - 59	21	29.6	7	9.9	28	39.4
60 - 69	26	36.6	3	4.2	29	40.8
70 - 79	1	1.4	0	0.0	1	1.4
Total	58	81.7	13	18.3	71	100

Calculated percentage in relation to total
Source: clinical records

Several risk factors are described in the literature for the development of esophageal neoplasia. In the study, smoking (56.3%), alcohol consumption

(54.9%), coffee (43.7%) and inadequate diet (32.4%) were the most frequent. In the male sex, alcohol consumption (65.5%), smoking (60.3%) and coffee consumption (48.3%) predominated, while in the female sex smoking (38.5%) was the least frequent. There was no significant relationship between symptoms and sex in the surgical patient (Table 2).

Table 2. Distribution of patients by sex and risk factors

Risk Factors		Sexo				Total	
		Masculine N=58		Feminine N=13			
		No.	%*	No.	%*	No.	%**
Smoking habit	X^2=2.0674 $pX^{2fisher}$=0.1298	35	60.3	5	38.5	40	56.3
Alcohol consumption	X^2=0.0002 $pX^{2fisher}$=14.32	38	65.5	1	7.7	39	54.9
Coffee consumption	X^2=0.087 $pX^{2fisher}$=2.7404	28	48.3	3	23.1	31	43.7
Improper diet	X^2=0.3286 $pX^{2fisher}$=0.6308	20	34.5	3	23.1	23	32.4
Esophagitis	X^2=1.6918 $pX^{2fisher}$=0.1934	3	5.2	2	15.4	5	7.0
GORD	X^2=1.3818 $pX^{2fisher}$=0.398	1	1.7	1	7.7	2	2.8
Acalasia	X^2=1.3818 $pX^{2fisher}$=0.398	1	1.7	1	7.7	2	2.8
Hernia hiatal	X^2=1.3818 $pX^{2fisher}$=0.398	1	1.7	1	7.7	2	2.8

GORD: Gastro-oesophageal reflux disease
*Percentage calculated with respect to sex; **Percentage calculated with respect to total number of patients
Source: clinical records

Table 3. Clinical symptoms refered by patients

Clinical symptoms		Gender				Total	
		Masculine		Feminine			
		No.	%*	No.	%*	No.	%**
Dysphagia	X^2=0.5467 $pX^{2fisher}$=0.3783	53	91.4	11	84.6	64	90.1
Weight loss	X^2=0.0233 $pX^{2fisher}$=0.5583	37	63.8	8	61.5	45	63.4
Asthenia	X^2=0.0013 $pX^{2fisher}$=0.6039	36	62.1	8	61.5	44	62.0
Anorexia	X^2=0.0992 $pX^{2fisher}$=0.4941	34	58.6	7	53.8	41	57.7
Epigastric pain or retrosternal (or both)	X^2=0.2675 $pX^{2fisher}$=0.4158	18	31.0	5	38.5	23	32.4
Odinofagia	X^2=1.7121 $pX^{2fisher}$=0.1639	16	27.6	6	46.1	22	31.0

*Calculated percentage with respect to the total number of patients with the symptom (per row).
** Calculated percentage of total number of patients (per column)
Source: clinical records

The prevalent symptoms in both sexes were dysphagia (90.1%), weight loss, asthenia and anorexia (which were present in more than 50%), epigastric pain (32.4%) and odynophagia (31%). There was no significant relationship between symptoms and sex in the surgical patient (Table 3).

Figure 1 is an illustration In 56.3% of the total the lesion was located in the middle third, 22.5% in the lower third and 21.1% in the esophago-gastric junction. In the middle third the prevalent histological type was squamous cell carcinoma (40 of 44, 90.9%), while adenocarcinoma was observed in the esophago-gastric junction (55.6%) and in the lower third (44.4%). No patient with esophageal cancer was found in the upper third location. There was an excellent significant relationship between tumor location and histology ($pX^{2fisher}$=0.000; V^{Cramer}=0.9).

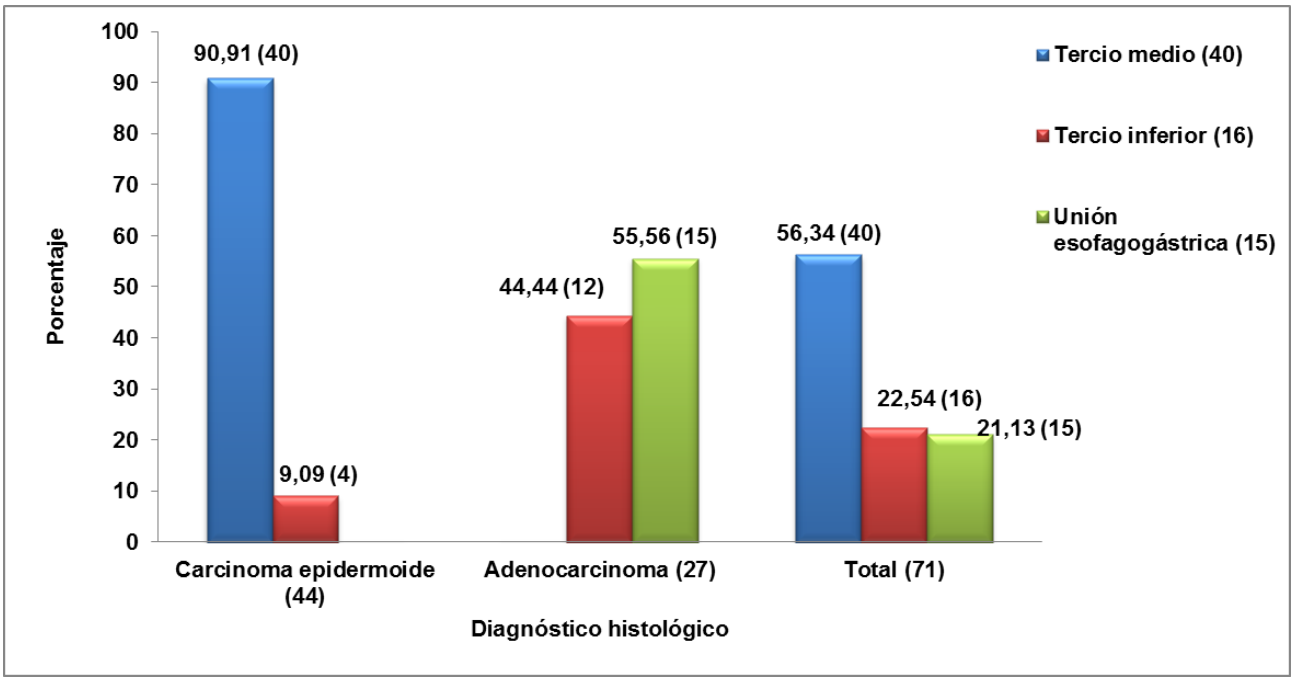

Figure 1. Tumor localization and histological diagnosis
Calculated percentage in relation to histological diagnosis
X^2=58.2702; $pX^{2fisher}$=0.000; V^{Cramer}=0.9
Source: clinical records

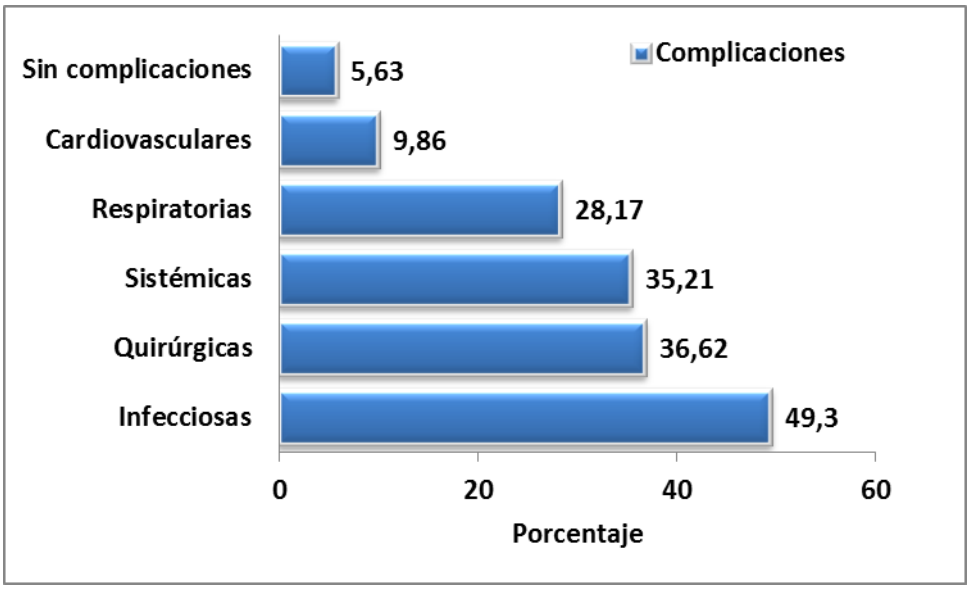

Figure 2. Surgical complications in patients. Source: clinical records

As can be shown in Figure 2, 94.4% of the patients had some complication: 49.3% were infectious, 36.6% surgical, 35.2% systemic, 28.2% respiratory and 9.9% cardiovascular.

From the total number of individuals, 20 died (20.8%). Hospital stay of 10 to 19 days prevailed (37, 52.1%). In the group of those who died, 70% were hospitalized from 10 to 19 days, while in the living group it ranged from 10 to 29 days. Eight patients were hospitalized for more than 30 days, of whom two died. There was no significant relationship between hospital stay and the patient's final condition ($pX^{2fisher}$=0.1624) -Figure 3-.

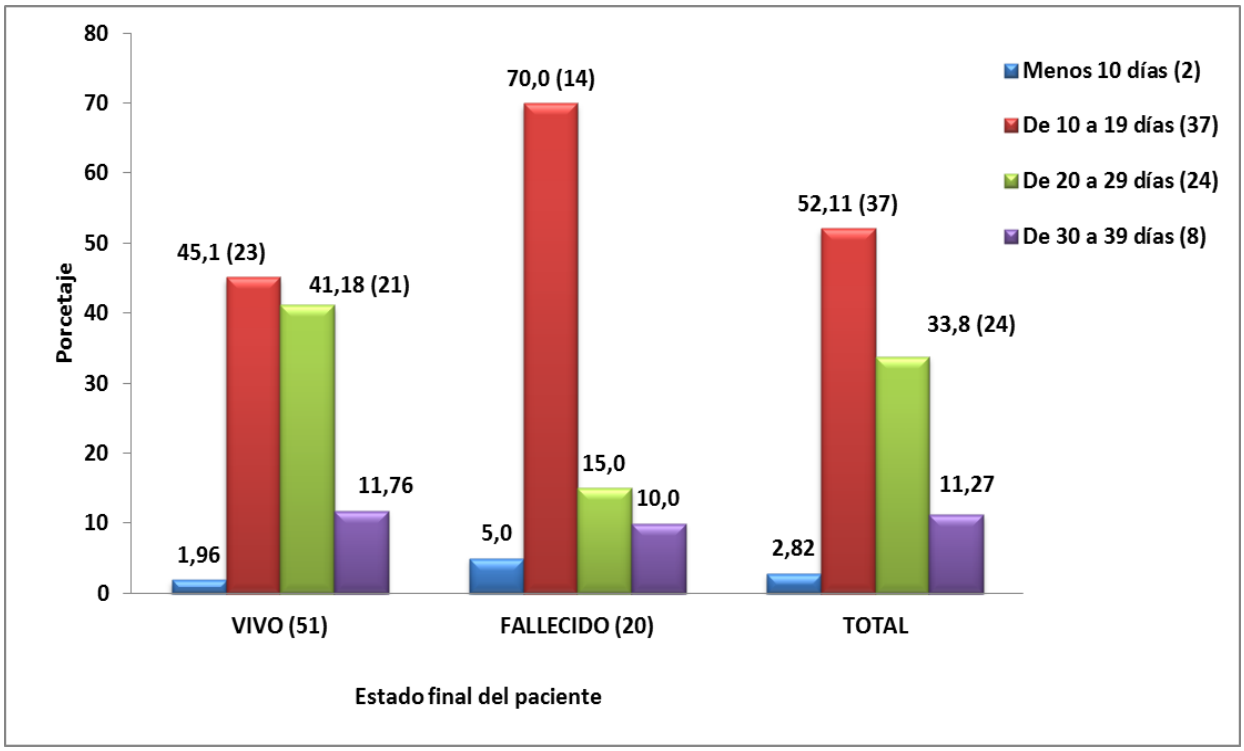

Figure 3. Hospital stay and discharge status
X^2=5.1324; $pX^{2fisher}$=0.1624; V^{Cramer}=0.2
Source: clinical records

DISCUSSION

Analyzing the results of the current research and comparing them with those obtained in other studies, it can be observed that in one conducted in Paraguay, in the period from January 2016 to December 2018, a predominance of male sex was obtained (32, 86.48%), a result similar to that found in the present research, in which male sex also predominated (58, 81.69%); however, in terms of age, it refers an average of 72 years, with a predominant age range that was between 71 and 80 years, for 56.75% of the sample.[3] In Cuba, it is considered that the strength of Primary Health Care and the accessibility to secondary and tertiary centers allow detection of esophageal cancer at earlier ages.

Another study was described that there were no significant differences between both sexes, unlike the present research, in which there was a predominance of the male sex, which is considered to be related to the demographic distribution of the provinces of Villa Clara and Santiago de Cuba or to the idiosyncrasy and cultural factors that influence esophageal cancer risk factors.[10]

In some researches carried out in two hospitals in Santiago de Cuba during 10 years, an age range and a predominance of male sex are reported, which coincide with those of the present research. The Spanish Society of Medical Oncology, in its web page, published: "Esophageal cancer is more frequent in men than in women, the ratio may oscillate between three and 10 men for every woman, depending on the geographic area. The usual age of presentation is between 55 and 70 years of age, and cases are rare in people under 40 years of age."[6,11]

Regarding risk factors, inadequate diet is reported as the most significant, although smoking and alcohol consumption are present in more than 60% of patients,[10] results that differ from those of the present investigation.

The American Society of Clinical Oncology, in a publication on its website in 2019, cites age between 45 and 70 years, male sex and toxic habits, tobacco and alcohol above all, as the main risk factors for the development of the histological type squamous cell carcinoma.[12]

When analyzing other variables such as the cardinal symptom presented in patients, the predominant reason for consultation was dysphagia (33, 89.18%);[3] similar to the result found in this research (64, 90.14%). In other studies, dysphagia also predominated as a symptom,[10,11] results that coincide with those found in the present investigation.

According to the location, there was a predominance of esophageal cancer in the middle third (40, 56.34%), a result that coincides with that of another study.[13] Other studies differ in their results with that found in this research, in which esophageal cancer in the lower third predominated for the histological type of adenocarcinoma.[6,10,11,13]

Epidermoid carcinoma was the predominant histological type found (44, 61.97%), a result that is similar to that found in other studies;[3,11] however, the Sociedad Española de Oncología médica reports that in Spain an increase has been seen and the histological variety of adenocarcinoma predominates.[6]

The results of this research differ in the study of post-surgical complications due to the operationalization of the variable, which is very diverse in the different sources consulted; nevertheless, there is coincidence in that infectious complications are the most frequent and, within them, pneumonia.

Another study shows that 40 patients (44.1%) presented this complication. In a study developed at the Catholic University of Chile, 27% of respiratory complications were reported and 20% of them were pneumonia.[11,14]

In general, the rate of complications is reported to be between 63 and 78%. The authors consider that their occurrence depends on several aspects ranging from the general condition of the patient to the surgical technique used, and the transoperative and postoperative periods cannot be ruled out (in the latter, mechanical artificial ventilation and care in an Intensive Care Unit are key aspects, as well as the expertise of specialists in Anesthesiology, Surgery and Intensive Care and Emergency Medicine in the management of the patient).

Regarding hospital stay, the authors presented the difficulty that it is practically not addressed in the bibliographies consulted, an aspect of utmost importance due to its importance in hospital costs. In the present study, a significant statistical association was found between hospital stay and the condition at discharge as alive or dead. The shorter the hospital stay, the more patients died.

Similar results were found in the study of the Pontifical Catholic University of Chile because 30-day mortality was 7.4%; in the present study it was 11.27%, a slightly higher value.[14]

CONCLUSIONS

There was predominance of male sex and the age group from 60 to 69 years, smoking was the most prevalent risk factor and dysphagia was the cardinal symptom. The most affected esophageal segment was the middle third, with histological diagnosis of squamous cell carcinoma. Infectious complications predominated, with a mean hospital stay of 10 to 19 days. Most patients were discharged alive.

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CONFLICT OF INTEREST

Authors declare that there is no conflict of interest.

CONTRIBUTION OF THE AUTHORS

AVB: conceptualization, data curation, research, methodology, project management, writing the original draft, writing (proofreading and editing).
MRFR: visualization, writing (proofreading and editing).
ETGP: formal analysis.
YGA: supervision.