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Oesophageal Mycosis: Epidemiological and Clinical Aspects and Risk Factors for Occurrence in the Digestive Endoscopy Unit of the Donka National Hospital, Conakry CHU

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Abstract

Introduction: Oesophageal mycosis (OM) is one of the most common opportunistic infections in patients infected with HIV (Human Immunodeficiency Virus). However, this condition is increasingly observed in immunocompetent subjects. The aim of this study was to determine the endoscopic prevalence, clinical characteristics and risk factors for the occurrence of oesophageal mycosis in our department. **Patients and Method:** This was a prospective cross-sectional study of all patients who underwent oeso-gastroduodenal fibroscopy during the period from 1st January to 31st December 2022, *i.e.* one year, at the digestive endoscopy unit of the hepato-gastroenterology department of the Donka CHU national hospital in Conakry. All patients found to have oesophageal mycosis by FOGD were included. The endoscopy was performed using appropriate equipment: A Fujinon 4400 video endoscopy column; Three Fujinon EG 590 video gastroscopes; A hoover; Data were collected using a pre-established survey form and analysed using Epi info software version 6.0.4; Pearson's Chi^2 test as a test of independence and the exact 5% threshold ficher test. **Results:** Out of 1343 upper gastrointestinal endoscopies performed, 107 cases of oesophageal mycosis were found, representing a prevalence of 7.96%. The mean age was 40 years, with a male predominance of 55.42%. The sex ratio M/F was 1.24. The 45 and over age group was the most affected, with a prevalence of 40.43%, followed by the [35 - 45] age

group, with a prevalence of 22.43%. Clinical symptoms were dominated by epigastralgia in 74.76% of cases, followed by odynophagia in 37.38% of cases, nausea and vomiting in 28.03% of cases, and pyrosis in 26.16% of cases. Oesophageal mycosis without oesophagitis was the most common endoscopic finding in 70% of cases. The main associated endoscopic lesions were erythemato-erosive and congestive gastropathy in 28.03% of cases, peptic oesophagitis (9.34%) and gastric ulcer (5.60%). The main risk factors found were positive HIV serology in 39.25% of cases, and diabetes in 24.30% of cases, with a statistically significant relationship of 0.02 and 0.01 respectively. **Conclusion:** Oesophageal mycosis is the most common opportunistic infection in patients with impaired cellular immunity. The prevalence of oesophageal mycosis in our series was 7.96%. This study enabled us to identify the main risk factors for the occurrence of oesophageal mycosis. Our country needs to step up its programme to combat and prevent immunodeficiency diseases, particularly HIV and diabetes.

Keywords

Endoscopy, CHU Conakry, Risk Factors, Immunosuppression, Oesophageal Mycosis

1. Introduction

Oesophageal mycosis (OM) is one of the most common opportunistic infections in patients with impaired cellular immunity, such as acquired immunodeficiency virus infection [1]. However, this condition is increasingly seen in immunocompetent subjects. When oesophageal mycosis has been found in immunocompetent patients, pre-disposing medical conditions have often been identified. Broad-spectrum antibiotics can eliminate certain bacteria in the intestinal flora that inhibit fungal growth, thereby increasing fungal proliferation [2]. Proton pump inhibitors (PPIs) are widely used and some studies link their use to the development of oesophageal mycosis [3].

Other studies have shown that corticosteroids and cytotoxic drugs are also possible risk factors for oesophageal mycosis [4].

The digestive system, and in particular the digestive tract, is a prime target for opportunistic infections (OIs) in HIV. Digestive manifestations during HIV infection are frequent and polymorphic [5]. The most frequent OIs in HIV infection are fungal infections, although the incidence has fallen significantly since the introduction of highly active antiretroviral treatments. These opportunistic infections are most often observed in patients who have not yet been initiated on antiretroviral treatment, who are initially on antiretroviral treatment, who have failed therapy or who are non-compliant with their treatment, and they represent a good marker of the severity of the immune deficiency [6].

Localized or generalized fungal infections of the digestive tract caused by the

Candida genus are grouped together under the term digestive candidiasis. Yeasts of the Candida genus are responsible for 90% of mycoses of the digestive tract. Digestive candidiasis presents very few complications in immunocompetent subjects, but the situation is different in immunocompromised subjects. In the latter, the digestive focus may be the starting point for systemic dissemination, with a mortality rate close to that of septic shock (30% - 60%). Oropharyngeal candidiasis occurs at all stages of HIV infection as soon as the CD4 count falls below 200/mm^3 and is symptomatic in advanced HIV disease when the CD4 count is below 100/mm^3 [7] [8].

The prevalence of oesophageal mycosis is not known in our department. The polymorphism of clinical manifestations, the need to determine risk factors and the absence of previous studies prompted us to carry out this study, the aim of which was to determine the endoscopic prevalence, clinical characteristics and risk factors for the occurrence of oesophageal mycosis in our department.

2. Patients and Method

This was a prospective cross-sectional study conducted in the digestive endoscopy unit of the hepato-gastroenterology department of the Donka CHU national hospital in Conakry, from 1st January to 31st December 2022.

Target population: patients who underwent oes-ogastroduodenal fibroscopy during the study period constituted our target population.

Inclusion criteria: all patients in whom FOGD demonstrated oesophageal mycosis were included.

The endoscopy was performed using appropriate equipment:

- A Fujinon 4400 video endoscopy column
- Three Fujinon EG 590 video gastroscopes
- A hoover

FOGD was performed under local oro-pharyngeal anaesthesia with xylocaine 2% gel, or under sedation with valium according to the patient's choice. The patient's consent was obtained orally before the oeso-gastroduodenal fibroscopy was performed. Patients presented in the morning on an empty stomach. Disinfection of the equipment was carried out manually in accordance with the recommendations of the Société Francaise d'Endoscopie Digestive (SFED) by placing the endoscope and accessories in Hexanios solution and brushing the endoscope with swabs. Sterilisation was carried out in a solution of Stérainos.

The parameters studied were:

Socio-demographic parameters: age, gender.

Clinical parameters: Personal history, clinical signs, epigastralgia, odynophagia, dysphagia, nausea, vomiting, pyrosis, regurgitation, hiccups, asymptomatic.

Biology: retroviral serology using the rapid test for HIV 1 and 2, blood sugar levels.

Risk factors: the following were considered to be risk factors in this study: diabetes, cirrhosis, cancer, chronic renal failure, positive HIV serology, long-term

use of antibiotics, use of proton pump inhibitors for more than 60 days, and use of corticosteroids.

Endoscopic parameters: FOGD to look for mycotic oesophageal lesions and other associated lesions.

The diagnosis of oesophageal mycosis was based on the endoscopic findings of adherent whitish coatings or lumps on the oesophageal mucosa that did not detach after washing, with or without oesophagitis.

Data were collected using a pre-established survey form and analysed using Epi info software version 6.0.4.

Pearson's Chi^2 test as a test of independence and the exact 5% threshold ficher test.

Ethical considerations: We have complied with the following ethical considerations:

- The moral and physical integrity of the individual.
- The person's free and voluntary consent.
- The confidentiality of the results and the anonymity of the people involved.
- Whether the person concerned wishes to withdraw without prejudice.

3. Results

Out of 1343 FOGDs performed, 107 cases of oesophageal mycosis were found, representing a prevalence of 7.96%. The mean age of our patients was 40 years, with extremes of 18 - 70 years. The over-45 age group was the most affected, with a frequency of 40.43%, followed by the [35 - 45] age group, with a frequency of 22.43%. Males predominated at 55.42%. The sex ratio M/F was 1.24. Clinical symptoms were dominated by epigastralgia in 74.76% of cases, followed by odynophagia in 37.38% of cases, nausea and vomiting in 28.03% of cases, pyrosis in 26.16% of cases, hiccups (24.29%), dysphagia (15.88%) and asymptomatic symptoms in 13.08% of cases (Table 1).

Oesophageal mycosis without oesophagitis was the most common endoscopic finding in 70% of cases (Table 2).

The main personal histories of our patients were: cirrhosis (38.31%), diabetes (28.03%), obesity (18.69%), chronic renal failure (CKD) in 16.82% of cases, pulmonary and/or peritoneal tuberculosis (10.28%), and alcohol consumption in 6.54% of cases.

The main risk factors found are presented in the table below (Table 3).

HIV serology was positive in 39.25% of cases and negative in 60.75%.

The associated endoscopic lesions were: erythematous and congestive gastropathy in 28.03% of cases, peptic oesophagitis (9.34%), gastric ulcer (5.60%), duodenal ulcer (10.28%), oesophageal varices in 3.8% of cases and no gastric lesion in 37.38% of cases.

Previous or current treatments were as follows: proton pump inhibitor (PPI) in 39.25% of cases, corticosteroid therapy (9.34%), antibiotics (35.51%), traditherapy (46.72%).

Table 1. Breakdown of patients by socio-demographic and clinical characteristics.

Variables	Workforce	Percentage (%)
Age range		
≤25 years old	18	16.63
26 - 35 years	22	20.5
36 - 45 years	24	22.43
≥45 years old	43	40.43
Gender		
Male	58	55.48
Female	48	44.58
Clinical signs		
Epigastralgia	80	74.76
Odynophagia	40	37.38
Nausea/vomiting	30	28.03
Pyrosis/Regurgitation	23	21.16
Hoquet	26	24.29
Dysphagia	17	15.88
Asymptomatic	14	13.08
Regurgitation	8	8.56

Table 2. Breakdown of patients by FOGD result.

FOGD result	Workforce	Percentage (%)
Mycosis without oesophagitis	75	70
Mycosis with oesophagitis	32	30

Table 3. Distribution of patients according to risk factors.

Risk factors	Workforce	Percentage	P value
HIV positive	42	39.25	0.02
Diabetes	26	24.30	0.01
Antibiotic	20	18.69	0.02
Taking PPI	18	17.02	
Corticosteroid therapy	13	12.15	0.001
Cirrhosis	11	10.06	
Neoplasia	9	8.9	0.006
IRC	7	7.01	

4. Discussion

Limitations: our sample size was small, 107 cases of oesophageal mycoses. This small sample could be explained by the short duration of the study, 1st January to

31st December 2022, *i.e.* one year, and by the very high cost of digestive endoscopy compared with the low purchasing power of Guineans.

During our study period, 107 cases of oesophageal mycosis out of a total of 1343 oeso-gastroduodenal fibroscopies were performed, giving an endoscopic prevalence of oesophageal mycosis of 7.96%.

This prevalence is slightly higher than those found by Faouzi *et al.* [9] in Dakar and Ibara *et al.* [10] in the Congo who reported prevalences of 5.05% and 4.44% respectively.

Our result is significantly lower than that found by Kondé A *et al.* in Mali [11] who reported a prevalence of mycotic oesophagitis in 23.5% of patients in their series. This difference could be explained by the size of the study population.

Our patients ranged in age from 18 to 70. The mean age was 40 years. This average was identical to that reported by Allah-Kouadio *et al.* [12] who noted an average age of 40 years with extremes of 22 - 65 years.

The age group most represented in our series was the fourth decade and above, with a frequency of 40.43%. The prevalence of oesophageal candidiasis increases with age [13]. However, age over 65 is not an independent risk factor, it is actually the increase in the number of risk factors in these patients that is the cause. The same risk factors are found in patients aged over 65 as in the general population [4] [14]. There is a male predominance (55.42%) in our series with a sex ratio of 1.24 in favour of men. This male predominance has been found in all series [11] [12]. This difference between the two sexes could be explained by the fact that men have easier access to care, as they are the ones who have the financial power in Africa in general and in Guinea in particular.

In our series, clinical symptoms were dominated by epigastralgia (74.76%), odynophagia (37.38%), nausea and vomiting (28.03%), dysphagia (15.88%) and 14 asymptomatic patients (13.08%).

This result is identical to those reported by Allah-Kouadio *et al.* in Côte d'Ivoire [12] who found a predominance of epigastralgia (38.48%), vomiting (19.23%) and odynophagia (11.53%).

Amri M *et al.* [15] found that the main clinical signs were pyrosis and regurgitation in 25% of cases, epigastralgia (20%), dyspepsia (17%), odynophagia and dysphagia with frequencies of 9% and 5% respectively.

In Mali, the main clinical signs were epigastralgia (29.8%), dyspepsia (5.3%) and vomiting (6.4%).

In our study, 14 patients (13.08%) were completely asymptomatic. Our result was close to that of Amri *et al.* [15] who found 17% of patients to be asymptomatic.

The diagnosis of this condition is usually suggested at upper digestive endoscopy in the presence of white patches on erythematous oesophageal mucosa Confirmatory biopsies after gram staining indicate the presence of mycelial filaments and pseudo hyphae with invasion of mucosal cells. In addition, culture makes it possible to identify the type of mycosis, which is most often Candida albicans [16] [17]. These examinations were not carried out in our patients.

However, according to several authors, upper gastrointestinal endoscopy is a reliable method for confirming the diagnosis of *Candida albicans* oesophagitis [18] [19].

In our series, oesophageal mycosis without oesophagitis was predominant in 70% of cases, compared with 30% of cases of oesophageal mycosis with oesophagitis. This result is similar to that of Allah-Kouadio *et al.* [12] in Côte d'Ivoire, who reported a predominance of oesophageal mycosis without oesophagitis.

Maiga MY *et al.* [20] in Mali and Ouattara A *et al.* [21] in Côte d'Ivoire found respectively lower frequencies of mycotic oesophagitis of 11.43% and 4.05% in their studies. The variability of the results could be explained by the difference in patient recruitment.

MO was associated with other endoscopic lesions; in our study, the main lesions were: erythemato-erosive and congestive gastropathy in 28.03% of cases, peptic oesophagitis (9.34%), gastric ulcer (5.60%), duodenal ulcer (10.28%) and oesophageal varices in 3.8% of cases.

In the study by Weerasuriya *et al.* in the United Kingdom [14], the predominant associated endoscopic lesions were cardiac hernia, gastritis, duodenitis and gastric ulcer.

The personal histories of our patients were diabetes (24.30%), cirrhosis (38.31%), chronic renal failure (16.82%), pulmonary and peritoneal tuberculosis (10.28%), and digestive and haematological neoplasia (7.47%). These results are identical to those reported by Amri *et al.* [15] who noted a personal history of diabetes (9.5%), cancer (8.4%) and chronic renal failure (5%).

The HIV-AIDS pandemic has led to the spread of this condition, as was the case in our series where the main risk factor found was HIV infection in 39.25%, followed by diabetes in 28.03%. Our findings were similar to those of Maiga, who found that 63.15% of patients in his series were infected with HIV [20].

As for Allah-Kouadio, almost half of their patients (46.15%) had positive serology, making HIV one of the main causes of oesophageal mycosis in immunocompromised subjects, or one of the symptoms of AIDS [12]. Although opportunistic infections have decreased significantly since the introduction of HAART (highly active antiretroviral therapy), HIV infection remains the main factor predisposing to the development of oesophageal candidiasis. The only large prospective European study, involving almost 10,000 HIV patients without oesophageal candidiasis at the time of inclusion, showed a 95% reduction in the incidence of oesophageal candidiasis between 1994 and 2004. A total of 15.8% of patients developed oesophageal candidiasis during follow-up. The onset of mycosis appears to correlate with the depth of immunosuppression, usually when the CD4 lymphocyte count is below 200/mm^3 [22] [23].

Other causes of immunodepression, in particular diabetes, cancer, long-term corticosteroid therapy, immunosuppressive and/or antibiotic treatments, have been incriminated in the occurrence of oesophageal mycosis. These risk factors were found in our study, as they were in other authors' studies [4].

In univariate analysis, we found a statistically significant association between OM and the risk factors studied: HIV positive (p = 0.02), diabetes (p = 0.01), long-term antibiotic use (p = 0.02), corticosteroid therapy (p = 0.001) and neoplasia (p = 0.006).

These results are comparable to those reported by Amri *et al.* [15] who noted a relationship between oesophageal mycosis and antibiotic therapy (p = 0.05), and corticosteroid therapy (p = 0.06). Similarly, Choi *et al.* [24], found a relationship between oesophageal mycosis and alcohol (p = 0.001), antibiotics (p = 0.015) and traditional therapy (p = 0.006) and Yakoob *et al.* [25], in Pakistan, found a relationship between OM and cancer (p = 0.001), diabetes (p = 0.001), corticosteroid therapy (p = 0.001) and antibiotics (p = 0.02).

In our series, there was no statistical association between the occurrence of OM and the use of PPIs, chronic renal failure or cirrhosis.

5. Conclusions

This study showed that oesophageal mycosis is the most common opportunistic infection in patients with impaired cellular immunity.

In the presence of oesophageal mycosis, HIV serology should be performed; this is an opportunistic infection in AIDS patients. The prevalence of oesophageal mycosis in our series was 7.96%, the symptomatology was polymorphous and there was a significant link between oesophageal mycosis and the main risk factors studied. In our country, it is necessary to strengthen the programme for the control and prevention of immunodeficiency diseases, particularly HIV and diabetes.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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