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Pak J Med Res
Vol. 63, No. 3, 2024

Original Article

Endoscopic Findings in HIV Positive Patients with Dysphagia Presenting at Lady Reading Hospital Peshawar

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Abstract

Background: The Human immunodeficiency virus (HIV) infection has a profound impact worldwide, with approximately 75.7 million individuals suffering and around 32.7 million individuals dead attributed to AIDS-related causes. HIV/AIDS impacts the gastrointestinal system with various symptoms influenced by infections, and the introduction of modern Highly Active Antiretroviral Therapy (HAART) has significantly changed the prevalence of these GI disorders.
Objective: This study aimed to determine the frequency of endoscopic findings in HIV patients with dysphagia.
Study type, settings & duration: This cross-sectional study was conducted at the Department of General Medicine, Lady Reading Hospital (LRH), Medical Teaching Institute (MTI), Peshawar from July to December 2020.
Methodology: The study included 136 HIV-infected patients with dysphagia who underwent upper GI endoscopy. All patients underwent upper GI endoscopy following informed consent. The baseline Information, including demographic data, including age, gender, and duration of HIV infection, was collected for each patient. Data analysis was performed using (SPSS) version 23.
Results: According to the findings, gastric erythema (18.4%), Candida esophagitis (30.1%), peptic ulcer (9.6%), hiatal hernia (21.3%), erosions (5.1%), and Candida antral gastritis (16.9%) were the most frequent endoscopic findings. The mean age of the patients was 43.316±6.92 years, the mean duration of HIV infection was 12.632±5.26 months, and the mean weight was 80.345±6.56 Kg.
Conclusion: According to the study's findings, most HIV patients who experienced gastrointestinal symptoms also had opportunistic infections and altered upper GI mucosa. Early endoscopic and histological evaluation is recommended for these individuals in order to support fast detection and treatment of upper GI issues, which will enhance patient outcomes and quality of life.
Key words: HIV patients, dysphagia, endoscopic findings.

Introduction

The Human immunodeficiency virus (HIV) infection has a profound impact worldwide, with an approximately 75.7 million individuals suffered and around 32.7 million individuals dead attributed to AIDS-related causes. While annual new infections and AIDS-related deaths have declined from their peaks, the pandemic remains a significant global health concern.[1] In recent years, the prevalence of HIV/AIDS has risen, attributed in part to advancements in treatment that enable patients to lead longer lives with the virus. Efforts focused on education, prevention, and research related to acquired immunodeficiency syndrome (AIDS) have been intensified to decrease transmission and enhance virus treatment. Notably, there has been a decline in the annual number of new infections since the 1990s.[2] While developed nations have achieved significant reductions in mortality, improved quality of life, and lowered transmission rates, sub-Saharan

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Email: drmba@yahoo.com
Received: 30 November 2023, **Accepted:** 06 September 2024
Published: 08 October 2024

Authors Contribution

RS & MB conceptualized the project. RS, NI & MSK did the data collection. MB, YK & MF performed the statistical analysis. RS & NI also did the literature search. Drafting, revision & writing of manuscript were done by RS, MSK, YK & MF.

Africa remains a hotspot, with an around 25 million individuals alive with positive HIV.[3] Dysphagia, or difficulty swallowing, can result from various malfunctions within the swallowing mechanism. It can significantly impact quality of life, hinder proper nutrition, and lead to aspiration, a condition where food or secretions enter the airway, potentially compromising breathing.[4] Approximately 1 million new cases are diagnosed each year in the US. While only a minority of affected individuals seek medical attention, a total of 20% prevalence were reported, with a higher incidence among women and older adults.[5]

Pakistan, a large country in South Asia, currently has 24,331 individuals registered with the National AIDS Control Program (NACP) as living with HIV as of June 2019. However, it is believed that the actual number of persons living with the virus is over 165,000. The HIV epidemic in Pakistan primarily affects specific vulnerable populations. The concentration of the epidemic is as follows: 38.4% in people who inject drugs (PWID), 7.5% in transgender sex workers (TGSW), 7.1% in transgender people (TG), 5.6% in male sex workers (MSW), 5.4% in men who have sex with men (MSM), and 2.2% in female sex workers (FSW). The largest concentration of People Living with HIV (PLHIV) is found in Punjab, with 75,000 individuals, followed by Sindh with 60,000 individuals.[6]

As advancements continue, new challenges arise, such as addressing the prevalent gastrointestinal issues in HIV/AIDS patients. Despite the significant contribution of antiretroviral therapy (ART) to extending the life expectancy of individuals with HIV/AIDS, both short and long-term adverse effects pose a risk to treatment adherence and overall quality of life.[7] Alterations in the intestinal mucosa and gut immune system during HIV disease are extensively documented. These changes encompass CD4+ T cell depletion, enterocyte death, tight junction loss, reduced immunoglobulin A levels, and dysbiosis.[8] Endoscopy holds a crucial role in managing patients with these disorders, as many of them exhibit distinct appearances during endoscopic examination. As immunodeficiency advances, endoscopy emerges as a highly valuable diagnostic tool for identifying predisposing opportunistic disorders and other inflammatory conditions.[8,9] Parvin R et al. demonstrated in their study that the occurrence rates were 45% for Gastric erythema, 14% for Hiatal hernia, 10% for Peptic ulcer, and 6% for erosions. Additionally, another study by Parashar R et al. revealed frequencies of 22.6% for Candida esophagitis and 26.4% for Antral gastritis.[8,10] When it comes to the early diagnosis of opportunistic infections, nonspecific inflammatory illnesses, and other GI-related symptoms, endoscopy is a very useful tool. The frequency and prevalence of several GI disorders in HIV-positive individuals have changed dramatically since the introduction of highly active antiretroviral therapy (HAART), particularly with the introduction of more recent HIV regimens. In Peshawar, HAART is still not generally accessible. In these circumstances, it is critical to document the clinical experience since an accurate representation of the illness observed may guide appropriate patient treatment and referral to alternative settings.[11] The study objective was to ascertain the percentage of endoscopic findings in HIV patients presenting with dysphagia.

Methodology

This retrospective cross-sectional study was carried out in the General Medicine department of Lady Reading Hospital, Medical Teaching Institute (MTI), Peshawar from July to December 2020. A non-probability consecutive sampling technique was utilized to recruit the participants. The sample size was calculated using WHO software (Raosoft Calculator), resulting in a total of 136 sample size, with 95% confidence interval, absolute precision of 4%, and anticipated proportion of erosion on endoscopy at 6%.[11] The study included 136 HIV-positive patients with dysphagia, recruited from the Department of General Medicine, LRH, MTI, Peshawar. The baseline Information including demographic data (age, gender) and duration of HIV infection, was collected for each patient. The consent form from patients was obtained, ensuring confidentiality and explaining the potential risks associated with endoscopy. All patients underwent upper GI endoscopy following informed consent. The intravenous injection of midazolam (02 mg) and Oral Xylocaine was administered as pre-medication, while for visualization the Pentax EG 2940 Video endoscope was used. Before the procedure, the endoscopic equipment was disinfected with 2% glutaraldehyde. Infection control practices for HIV included meticulous pre-procedure sterilization, strict adherence to protective barriers during the procedure, and thorough disinfection and disposal of materials post-procedure to prevent risk of transmission. The endoscopic procedure of duodenal mucosa, gastric, and esophagous was performed carefully for the identification of Gastric erythema, Hiatal hernia, Peptic ulcer, Erosions, Candida esophagitis, Antral gastritis. The Endoscopies were performed and reported by a consultant gastroenterologist and findings were

documented on a specially designed proforma according to established operational definitions.

All collected data was entered in the Microsoft Excel Sheet 2020 and then arranged for statistical analysis by Statistical Package for Social Science (SPSS) Software. The percentages, along with frequencies, were calculated for different categorical parameters, including all endoscopic findings with gender data. The mean and standard deviation (±SD) were also observed for quantitative parameters including duration of HIV infection, age, and weight (measured on a weighing scale). The data was categorized as per duration of HIV infection, gender, age, and weight, to assess the impact of these variables on endoscopic findings. Post-categorization, the p-values were also found after performing the Chi-square testing for the significant of data, considering p-value less than 0.05 significant.

The ethical approval was obtained from the Ethical Review Board of Lady Reading Hospital, Medical Teaching Institution, Peshawar vide letter no. 36/LRH/MTI.

Results

The demographic data of the study show that the total number of samples in the study are 136, in which male participants are 126 with percentage of 92.6, and female are 10 in number with 7.4% Figure-1. The age of participants ranged from 18-60 years with mean age of 43.3±6.9, mean duration of HIV 12.632±5.26 months and mean weight was 80.345±6.56 Kg as shown in Table-1.

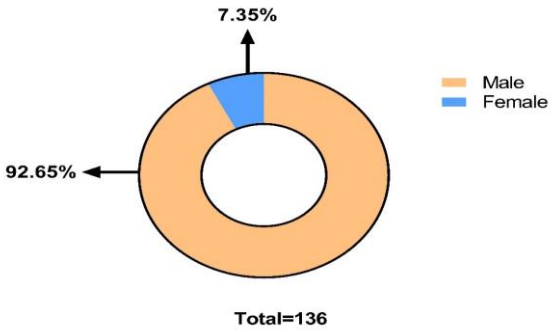

Figure 1: Frequency and %age of patients according to gender.

The frequency and percentage of patients having Gastric Erythema is25 and 18.4%, Hital Hernia 29 and 21.3 &, Peptic Ulcer 13 and 9.6%, Erosions 7 and 5.1%, Candida Esophagitis 41 and 30.1% and Candida Antral Gastritis is 23 and 16.9%. The frequency and percentage of patients having no Gastric Erythema is111 and 81.6%, similarly, Hital Hernia 107 and 78.7%, Peptic Ulcer 123 and 90.4%, Erosions 129 and 94.9%, Candida Esophagitis 95 and 69.9% and Candida Antral Gastritis is 113 and 83.1% as shown in Figure-2.

Table 1: Mean±SD of patients according to age, duration of HIV and weight. (n=136)

Demographics	*Mean ± SD*
Age (years)	43.316±6.92
Duration of HIV (months)	12.632±5.26
Weight (Kg)	80.345±6.56

Stratification of age with Gastric Erythema, Hital Hernia, Peptic Ulcer, Erosions, and Candida Esophagitis are shown in Table-2. Stratification of gender with Gastric Erythema, Hital Hernia, Peptic Ulcer, Erosions, and Candida Esophagitis are shown in Table-3. Stratification of duration of HIV infection in months with Gastric Erythema, Hital Hernia, Peptic Ulcer, Erosions, and Candida Esophagitis are show in Table-4. Stratification of weight with Gastric Erythema, Hital Hernia, Peptic Ulcer, Erosions, and Candida Esophagitis are shown in Table-5.

Discussion

HIV/AIDS is a complex condition affecting nearly every organ system, including the gastrointestinal (GI) system, leading to a diverse array of GI symptoms. HIV-related symptoms are significantly influenced by infections (non-opportunistic and the opportunistic), given that virus is an immune illness. The introduction of Highly Active Antiretroviral Therapy (HAART), especially with more recent regimens, has significantly altered the frequency and prevalence of several gastrointestinal illnesses in HIV-positive people. Our study revealed that Gastric Erythema occurred in 18.4% of patients, Hiatal Hernia in 21.3%, Peptic Ulcer in 9.6%, Erosions in 5.1%, Candida Esophagitis in 30.1%, and Candida Antral Gastritis in 16.9%. Notably, Candida esophagitis emerges as the most prevalent esophageal condition among HIV patients, occurring in 43-53% of cases prior to HAART introduction and 17–24% of cases after it.[12] Several studies have consistently revealed that the positive HIV individuals with CD4+ counts having less than 200 cells/µL have a more frequency of Candida infections than those with counts >200 cells/µL. Furthermore, people with elevated HIV viral loads had a higher prevalence of Candida infections.[12,13]

CMV (cytomegalovirus), herpes simplex virus (HSV), and Kaposi's sarcoma are significant

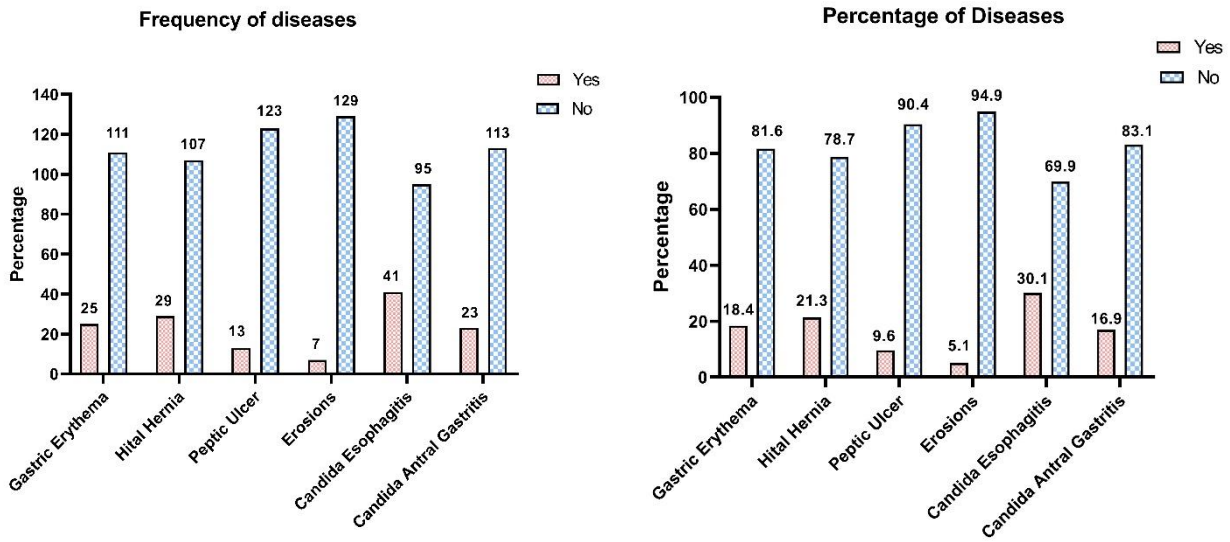

Figure 2: Percentage and frequency of different disease.

Age (years)	*Gastric Erythema*		*p-value*
	Yes	*No*	
18-40	11 (22.9%)	37 (77.1%)	
41-60	14 (15.9%)	74 (84.1%)	0.313
Total	25 (18.4%)	111 (81.6%)	
	Hital Hernia		
18-40	6 (12.5%)	42 (87.5%)	
41-60	23 (26.1%)	65 (73.9%)	0.064
Total	29 (21.3%)	107 (78.7%)	
	Peptic Ulcer		
18-40	6 (12.5%)	42 (87.5%)	
41-60	7 (8%)	81 (92%)	0.389
Total	13 (9.6%)	123 (90.4%)	
	Erosions		
18-40	4 (8.3%)	44 (91.7%)	
41-60	3 (3.4%)	85 (96.6%)	0.214
Total	7 (5.1%)	129 (94.9%)	
	Candida Esophagitis		
18-40	16 (33.3%)	32 (66.7%)	
41-60	25 (28.4%)	63 (71.6%)	0.550
Total	41 (30.1%)	65 (69.9%)	

causes of esophagitis in individuals with HIV. CMV esophagitis manifests with symptoms such as odynophagia (painful swallowing) and dysphagia (difficulty swallowing), along with endoscopic findings of multiple well-defined shallow ulcers. These ulcers usually occur in the middle to lower portion of the esophagus.[11] Among the rarest infectious pathogens that cause esophagitis in HIV-positive people is HSV. Although they are more widely distributed throughout the esophagus, the shallow erosive ulcers brought on by HSV are comparable to those observed in erosive reflux esophagitis. When Kaposi's sarcoma occurs in the esophagus, it usually manifests as dysphagia instead of odynophagia.[14]

It appears in the gastrointestinal mucosa as submucosal ulcerations or linitis plastic,[8] lesions of Kaposi's sarcoma in the distal upper gastrointestinal tract typically do not manifest symptoms, there have been reports of instances where it caused acute hemorrhage.[14,15] There were no cases of lymphoma, Kaposi's sarcoma, or CMV/HSV infection reported in our investigation. The smaller sample size and a greater average CD4+ level compared to patients commonly diagnosed with these disorders are probably the reasons for the absence of these conditions.

Table 2: Stratification of diseases with respect to gender and their respective percentages.

Gender	*Gastric Erythema*		*p-value*
	Yes	*No*	
Male	24 (19%)	102 (81%)	
Female	1 (10%)	9 (90%)	0.477
Total	25 (18.4%)	111 (81.6%)	
	Hital Hernia		
Male	27 (21.4%)	99 (78.6%)	
Female	2 (20%)	8 (80%)	0.915
Total	29 (21.3%)	107 (78.7%)	
	Peptic Ulcer		
Male	12 (9.5%)	114 (90.5%)	
Female	1 (10%)	9 (90%)	0.961
Total	13 (9.6%)	123 (90.4%)	
	Erosions		
Male	7 (5.6%)	119 (94.4%)	
Female	0 (0%)	10 (100%)	0.444
Total	7 (5.1%)	129 (94.9%)	
	Candida Esophagitis		
Male	37 (29.4%)	89 (70.6%)	
Female	4 (40%)	6 (60%)	0.481
Total	41 (30.1%)	95 (69.9%)	

Table 3: Stratification of the duration of HIV and their percentages in different diseases.

Duration of HIV (months)	*Gastric Erythema*		*p-value*
	Yes	*No*	
6-12	13 (16.9%)	64 (83.1%)	
>12	12 (20.3%)	47 (79.7%)	0.606
Total	25 (18.4%)	111 (81.6%)	
	Hital Hernia		
6-12	19 (24.7%)	58 (75.3%)	
>12	10 (16.9%)	49 (83.1%)	0.276
Total	29 (21.3%)	107 (78.7%)	
	Peptic Ulcer		
6-12	8 (10.4%)	69 (89.6%)	
>12	5 (8.5%)	54 (91.5%)	0.707
Total	13 (9.6%)	123 (90.4%)	
	Erosions		
6-12	2 (2.6%)	75 (97.4%)	
>12	5 (8.5%)	54 (91.5%)	0.124
Total	7 (5.1%)	129 (94.9%)	
	Candida Esophagitis		
6-12	22 (28.6%)	55 (71.4%)	
>12	19 (32.2%)	40 (67.8%)	0.647
Total	41 (30.1%)	95 (69.9%)	

Our research showed that, fewer HIV-positive people had gastroduodenitis of any kind and a reduced prevalence of Helicobacter pylori (H. pylori) infection. Comparing the affected individuals with CD4+ counts less than 200 cells/µL to those with the higher level, this difference was more noticeable.[16-19] These results could be explained by the frequent administration of antibiotics for therapeutic or prophylactic reasons in HIV-positive patients. Medications like erythromycin, amoxicillin, or broad-spectrum antibiotics are commonly prescribed to manage both routine and opportunistic infections.[17] The increasing atrophic involution of the stomach mucosa, which causes secondary hypochlorhydria and unfavorably alters the environment for bacterial survival, could perhaps be the cause of the weaker H. pylori colonization.[16-18] Another possible reason for the reduced H. pylori colonization in positive HIV cases might be the impaired mucosal cellular immunity and blunted inflammatory response associated with CD4+ T cell deficiency. H. pylori persistence in the gastric environment is known to rely on an intact mucosal immune reaction that triggers gastritis. This specific response has been observed to be diminished in individuals with a deficiency in CD4+ T cells.[20]

Table 4: Stratification of the weight and their percentages in different diseases.

Weight	*Gastric Erythema*		*p-value*
	Yes	*No*	
≤80	12(21.4%)	44(78.6%)	
>80	13(16.7%)	67(83.8%)	0.443
Total	25(18.4%)	111(81.6%)	
	Hital Hernia		
≤80	8(14.3%)	48(85.7%)	
>80	21(26.2%)	59(73.8%)	0.094
Total	29(21.3%)	107(78.7%)	
	Peptic Ulcer		
≤80	8(14.3%)	48(85.7%)	
>80	5(6.2%)	75(93.8%)	0.117
Total	13(9.6%)	123(90.4%)	
	Erosions		
≤80	2(3.6%)	54(96.4%)	
>80	5(6.2%)	75(93.8%)	0.487
Total	7(5.1%)	129(94.9%)	
	Candida Esophagitis		
≤80	20(35.7%)	36(64.3%)	
>80	21(26.2%)	59(73.8%)	0.237
Total	41(30.1%)	95(69.9%)	

In the context of the complications among HIV-positive patients, the findings from our study align and diverge in interesting ways when compared to the results reported by Zakir et al. and Nustas et al. Our research identified Candida esophagitis as the most prevalent condition, affecting 30.1% of participants, followed by hiatal hernia and gastric erythema. Similarly, Nustas et al., reported a significant association between dysphagia and Candida esophagitis, with 26.8% of patients presenting with this condition, which is consistent with our findings and emphasizes the high prevalence of fungal infections in the esophagus among this population.[21] In contrast, Zakir et al. found esophageal growths (29.84%) and esophageal strictures (17.46%) to be the most common findings, with gastroesophageal reflux disease (GERD) being less prevalent at 7.94%.[22] This variation suggests that while Candida esophagitis is a common finding across studies, the prevalence of other gastrointestinal conditions such as structural abnormalities and GERD may vary depending on the study population and regional factors. Mnyombolo et al. reported that diffuse gastritis was the most frequent upper endoscopy finding, affecting 35.3% of their study population. This contrasts with our study, where Candida esophagitis was the most common condition, observed in 30.1% of participants.[23]

In comparing our study's findings with those reported by Hassan et al., some key differences and similarities can be observed. Hassan et al. found that the most common abnormality on upper gastrointestinal endoscopy was esophageal varices, affecting 26.2% of their study population, followed by non-specific gastropathy (4.4%) and hiatal hernia (3.3%). In contrast, our study identified Candida esophagitis (30.1%), followed by hiatal hernia (21.3%) and gastric erythema. Additionally, Hassan et al. reported no significant differences in the prevalence of gastrointestinal abnormalities between males and females, which aligns with our findings where gender stratification showed no significant gender-related differences across various conditions. However, Hassan et al. observed that patients over the age of 50 were significantly more likely to have abnormal upper gastrointestinal findings ($p < 0.001$). In our study, while we stratified the conditions by age, significant age-related differences were not as pronounced.[24]

The study demonstrates that opportunistic infections and altered upper gastrointestinal mucosa are common among HIV-positive individuals experiencing gastrointestinal symptoms. In order to improve patient outcomes and quality of life by facilitating prompt diagnosis and treatment of upper GI problems, early endoscopic and histological examination is advised for these patients.

Conflict of interest: None declared.

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