ORIGINAL RESEARCH

Exploring Dysphagia: A Comprehensive Clinicopathological Study and Management Insights in a Tertiary Health Centre

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ABSTRACT
An observational study was conducted on 200 patients who presented complaints of dysphagia, both in the surgical outpatient department (OPD) and those admitted for further management in the ward. A comprehensive assessment, including detailed history, clinical examination, and endoscopy, was carried out. Given the assumption that dysphagia could be indicative of malignancy unless proven otherwise, each patient underwent evaluation. Diagnoses were established through a combination of clinical assessment, endoscopic findings, and histopathological results, guiding subsequent management decisions, which included conservative, palliative, endoscopic, and various surgical approaches such as open, laparoscopic, and minimally invasive techniques.The study revealed several key findings. Among the 200 patients, 70% were smokers, 26% were alcoholics, and 17% were tobacco chewers. The incidences of upper, middle, and lower esophageal malignancies were 7%, 7%, and 1%, respectively. Ca esophagus was present in 14% of the cases, while 43% had inflammatory pathologies like esophagitis, duodenitis, and gastritis. Barrett's esophagus was observed in 4% of patients, and 12% experienced dysphagia without any pathological findings. Endoscopy yielded no findings in 4% of cases, while 11% had conditions such as hiatus hernia, lipoma, diverticulum, and esophageal varices. Additionally, 12% suffered from extraluminal compression from external sources.Treatment varied based on the diagnosis, with 65% undergoing conservative measures, 7% requiring exploratory laparotomy and abdominal surgery, 14% undergoing esophageal surgery (including Ivor Lewis and transhiatal esophagectomy), and 7% receiving endoscopic and palliative interventions for malignancies.The study's results strongly suggest a correlation between dysphagia and habits like tobacco chewing, alcohol consumption, and smoking. Early diagnosis of the disease, identification of premalignant lesions, and appropriate management interventions can play a crucial role in preventing esophageal cancer.

Keywords:carcinoma esophagus, Dysphagia, Oesophagectomy, Endoscopy.

INTRODUCTION

Dysphagia, defined as the subjective perception of hindrance in the normal passage of ingested material, underscores the intricate interplay of neuromuscular coordination in the oral cavity, pharynx, and esophagus. This intricate orchestration takes place within a brief pause in respiration, highlighting the complexity of the swallowing process.[1]The emergence of flexible fiber-optic endoscopy has ushered in a new era in the screening and evaluation of individuals grappling with dysphagia. This advanced diagnostic tool offers a multitude of advantages, rendering the screening process safe, rapid, highly accurate in its findings, and notably comfortable for the patient.The flexibility of fiber-optic endoscopy enables clinicians to navigate and visualize the internal structures involved in swallowing with unprecedented precision. This not only facilitates the identification of potential abnormalities or obstructions but also allows for a comprehensive assessment of the dynamic coordination among the oral, pharyngeal, and esophageal components during the act of swallowing.Moreover, the safety profile of flexible fiber-optic endoscopy ensures that patients can undergo thorough examinations with minimal discomfort or risk.[2,3] The real-time imaging capabilities provide immediate insights, aiding in prompt and accurate diagnoses.In essence, the integration of flexible fiber-optic endoscopy into the diagnostic approach for dysphagia represents a significant leap forward, enhancing the efficiency and effectiveness of the evaluation process while

prioritizing the comfort and well-being of the individuals undergoing examination. The gastrointestinal (GI) tract orchestrates a multifaceted symphony of vital functions, encompassing digestion, absorption, excretion, and the intricate synthesis of an array of hormones, growth factors, and cytokines. Its significance is further emphasized by the presence of a complex enteric nervous system, finely tuned to control GI functions and communicate seamlessly with both the central and peripheral nervous systems. Additionally, the GI tract serves as a primary repository of foreign antigens, necessitating the deployment of well-developed arms of both the innate and acquired immune systems for defense.[4] Consequently, any malfunction or infection affecting this intricate organ system manifests in a broad spectrum of pathological conditions.Despite its pivotal role in health and disease, the gastrointestinal tract poses a challenge due to its limited accessibility to traditional examination methods. However, one of the most transformative developments in the realm of gastroenterology has been the evolution of diagnostic and therapeutic endoscopy. While radiological techniques have witnessed remarkable progress, particularly with the advent of multislice spiral computed tomography (CT) and magnetic resonance imaging (MRI), endoscopy stands out for its unique strength—the ability to conduct targeted mucosal biopsies.Advancements in endoscopic technology, such as capsule endoscopy and single/double-balloon enteroscopy, have overcome historical limitations, providing diagnostic and therapeutic access throughout the entire gastrointestinal tract. These innovations have opened up avenues for exploring previously inaccessible regions, including the jejunum and ileum. Techniques like chromoendoscopy, magnification endoscopy, and narrow-band imaging have significantly elevated the resolution at the mucosal level, contributing to enhanced diagnostic precision.Endoscopic ultrasound has emerged as a powerful tool capable of scrutinizing all layers of the intestinal wall and extraintestinal structures, offering a comprehensive understanding of pathology.[5,6] Experimental approaches, like confocal laser endomicroscopy, provide resolutions at a microscopic level, akin to standard histology. These strides in endoscopic diagnostic accuracy not only make it an invaluable tool for disease surveillance in specific patient groups but also position it as a cornerstone in population screening for gastrointestinal malignancies.Simultaneously, the therapeutic landscape of endoscopy has expanded rapidly, with luminal and extraintestinal surgeries now being routinely performed through endoscopic access. This dual capability of diagnosis and treatment positions endoscopy at the forefront of gastroenterological practice, revolutionizing the approach to gastrointestinal conditions and reaffirming its pivotal role in modern healthcare.

Dysphagia, the condition marked by difficulty in swallowing, manifests in distinct ways depending on the phase of the swallowing process affected.[7] When challenges arise in the voluntary phases, encompassing the oral or pharyngeal stages, individuals typically describe an inability to swallow properly. Interestingly, they don't commonly report the sensation of 'food sticking.' Instead, during a conscious attempt to initiate swallowing, there may be a failure of food to progress into the esophagus. This can result in retention in the mouth or unintentional entry into the airway, leading to coughing or spluttering. Importantly, this type of dysphagia is often associated with chronic neurological or muscular disorders, highlighting the intricate coordination required for these voluntary phases.Conversely, esophageal dysphagia is linked to difficulties in the involuntary phase and is characterized by a distinct sensation of food sticking during its passage through the esophagus.[8] This form of dysphagia can provide valuable insights into the underlying diagnosis, as the nature of the obstruction often correlates with specific conditions affecting the esophagus. Dysphagia can manifest acutely or chronically, affecting the ingestion of solids and/or fluids. It may present as an intermittent or progressive condition, adding to the complexity of its clinical presentation. Despite attempts by some patients to identify a specific site of impaction, such indicators can be unreliable, underscoring the need for comprehensive diagnostic evaluation.Esophageal cancer, as a malignancy of the esophagus, encompasses various subtypes, with squamous cell carcinoma and adenocarcinoma being the predominant forms. Squamous cell carcinoma tends to affect the upper two-thirds of the esophagus, while adenocarcinoma typically targets the lower third. The aetiological factors contributing to these subtypes include tobacco and alcohol for squamous cell carcinoma and gastroesophageal reflux disease (GORD) for adenocarcinoma.[9,10] The rising incidence of adenocarcinoma and the significant negative prognostic impact of lymph node involvement emphasize the importance of early detection.Dysphagia emerges as the most common presenting symptom in esophageal cancer, often surfacing as a late feature in the disease progression. Accurate pretreatment staging is essential for patients considered fit for 'curative' treatments, ensuring a tailored and effective therapeutic approach. The intricate interplay of symptoms, diagnostic insights, and therapeutic considerations underscores the complexity of dysphagia and its association with esophageal pathologies.

MATERIALS AND METHODS

This study, conducted over the course of one year, sought to delve comprehensively into the intricacies of dysphagia. Inclusivity was a key consideration, encompassing individuals across all age groups and

both genders who presented with the common complaint of dysphagia. A crucial prerequisite for participation was a baseline level of informed understanding, ensuring that participants were actively engaged and well-versed in the study's objectives and procedures. This criterion aimed to foster a collaborative research environment where participants were not only subjects but also informed contributors to the study.Furthermore, the inclusion criteria extended to individuals who demonstrated a willingness to comply with the stipulated study protocol. This commitment was vital for maintaining consistency and reliability in data collection, as well as ensuring that participants actively adhered to the outlined procedures and attended scheduled assessments. It underscored the importance of participant involvement and cooperation in the success of the study.Conversely, exclusion criteria were carefully defined to maintain the integrity of the study. Participants with a history of prior antineoplastic treatment were excluded, aiming to establish a cohort with a treatment-naive context. This exclusion criterion was crucial for isolating the impact of dysphagia without the confounding variables introduced by prior cancer-specific interventions.Additionally, individuals who exhibited an inability or unwillingness to adhere to the prescribed follow-up schedule were excluded. This criterion was implemented to guarantee the feasibility of consistent data collection throughout the study duration. It emphasized the importance of participant commitment to the follow-up process, contributing to the reliability of longitudinal data.In essence, the study's inclusion and exclusion criteria were thoughtfully crafted to enhance internal validity, minimize potential confounding factors, and allow for a focused exploration of dysphagia within the specified parameters. The goal was to create a research framework that not only facilitated rigorous scientific inquiry but also respected the collaborative nature of the participant-researcher relationship.

A meticulous approach to patient evaluation was undertaken, commencing with a comprehensive history-taking process. Patients were queried about their past medical history, with a specific focus on incidents related to corrosive substance ingestion, any pre-existing chronic illnesses, and a history of jaundice. The inquiry extended to personal history, with a particular emphasis on dietary habits and potential addictive behaviors such as tobacco chewing, smoking, and alcohol consumption. This thorough exploration aimed to gather pertinent information that could offer insights into the patient's overall health and potential contributing factors to their presenting condition.Following the detailed history, a systematic examination of the patients ensued. Past illnesses, especially those relevant to corrosive exposures, were scrutinized to establish a comprehensive medical context. This investigative approach considered potential correlations between the patient's medical history and the current complaint of dysphagia.A general physical examination was conducted to identify any signs of anemia, and vital parameters such as pulse rate, blood pressure, respiration, and body temperature were systematically recorded. This step ensured a baseline understanding of the patient's physiological status, helping to identify potential systemic factors contributing to dysphagia.

Localized assessments included an examination of the abdomen to detect any abnormalities, and an examination of the ears, nose, and throat (ENT) region was performed to rule out specific local causes of dysphagia. Furthermore, a holistic examination of other body systems was carried out to identify potential pulmonary complications and detect any associated systemic diseases that might be contributing to or exacerbating the dysphagic symptoms.This thorough and methodical approach to patient assessment aimed to not only diagnose and understand the primary complaint of dysphagia but also to uncover any underlying factors that could influence the management and treatment strategy. It underscored the importance of a comprehensive evaluation in providing a holistic view of the patient's health and guiding effective medical interventions.

RESULTS

Our research was conducted as a prospective study, involving a comprehensive endoscopic examination of patients experiencing symptoms of dysphagia. This investigation took place at C.R.G.H. and U.C.T.H., encompassing a cohort of 200 individuals presenting with dysphagia-related symptoms. The primary objective of the study was to diagnose and categorize various esophageal diseases, with a specific emphasis on identifying potential cases of esophageal carcinoma.The study aimed to explore the incidence of different esophageal diseases in relation to various demographic factors such as age, sex, and personal history. By conducting endoscopic examinations on all participants, we sought to obtain a detailed understanding of the prevalence of esophageal pathologies and their distribution within the studied population.Particular attention was given to investigating the occurrence of dysphagia with a primary focus on malignancies. The goal was to elucidate patterns and associations between dysphagia and the development of esophageal cancers. This comprehensive approach to understanding the epidemiology of dysphagia allowed us to assess the impact of age, gender, and personal history on the prevalence and nature of esophageal diseases within our study cohort.Furthermore, the study aimed to contribute valuable insights into the management of dysphagia, particularly when malignancies were identified. By delineating the characteristics of esophageal diseases and their correlation with dysphagia, we sought to provide a foundation for informed decision-making in the clinical management

of patients with these conditions. The research, thus, not only contributed to the understanding of esophageal diseases but also aimed to guide effective strategies for diagnosis and subsequent interventions, with a specific focus on cases associated with dysphagia.

In our study, a cohort of 200 patients was carefully examined, revealing distinctive demographic patterns among the participants. Notably, a significant majority, comprising 40% of the total patient population, fell within the 40-60 years age group. This age bracket emerged as the most prevalent among the study participants, indicating a notable concentration of cases in this particular demographic range.Furthermore, within this overarching 40-60 years age group, a more refined analysis highlighted that a substantial 28% of the patients specifically belonged to the 40-50 years age subset. This finding underscored a noteworthy concentration of cases within the earlier half of the 40-60 years age range.These demographic insights provide a valuable snapshot of the age distribution within our study cohort. The concentration of cases in the 40-60 years age group, and particularly within the 40-50 years subgroup, prompts further exploration into potential age-related factors influencing the prevalence of dysphagia and associated esophageal diseases. Such nuances in demographic distribution contribute to a more nuanced understanding of the population under study, informing future research directions and clinical considerations related to dysphagia in different age cohorts.

In our comprehensive study involving 200 participants, a notable gender distribution pattern emerged, revealing a majority of 60% male participants and 40% female participants. This gender breakdown underscores a discernible male preponderance within the study cohort.

Table1: Gender distribution of patients

Gender	N(%)
Male	60
Female	40

Figure 1: Gender distribution of patients

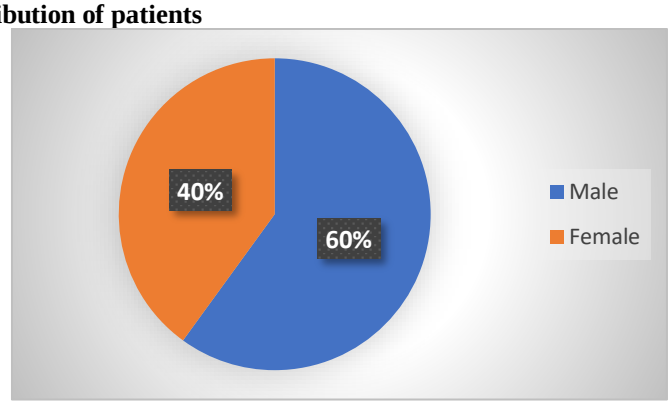


Figure2: Distribution of patients According to history of Smoking

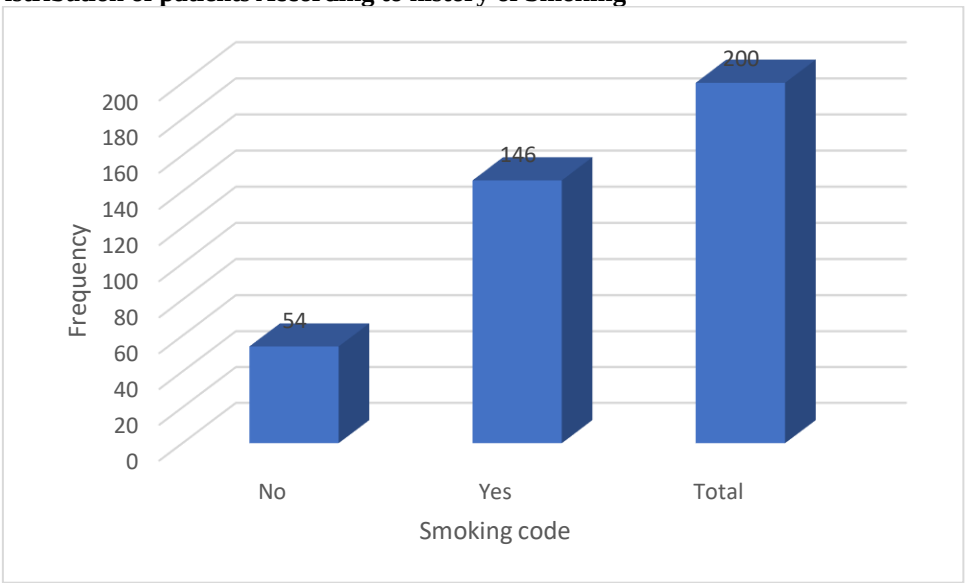


Table2: Alcohol intake distribution of patients

Alcohol	Frequency
No	172
Yes	28
Total	200

Figure3: Anatomical site wise distribution of patients a) Upper 1/3 distribution of the Patients

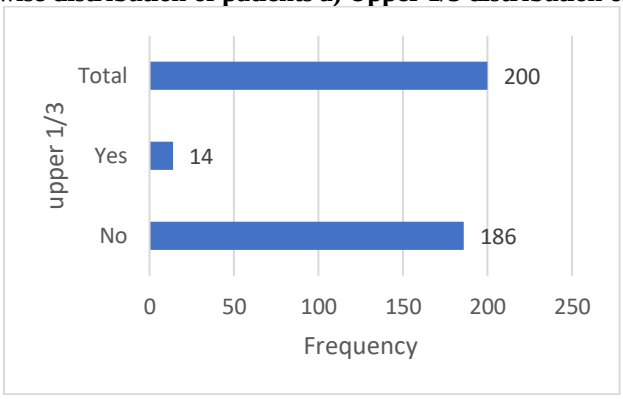


Table 3: Middle 1/3 distribution of the Patients

Middle 1/3	Frequency
No	186
Yes	14
Total	200

Figure 4: Lower 1/3 distribution of the Patients

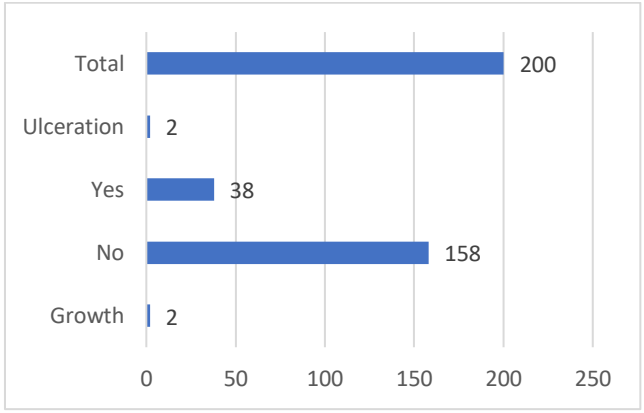
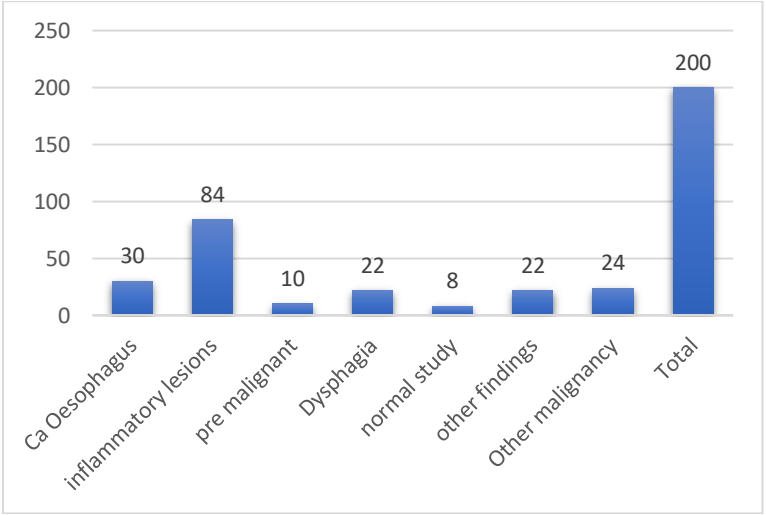


Figure 5: Diagnosis wise distribution of the Patients



DISCUSSION

Our study spanned a duration of one year, during which a thorough examination was conducted on a cohort of 200 participants who presented with complaints of dysphagia.[11] These individuals underwent endoscopic examinations, which were carried out both for inpatients and on an outpatient basis, ensuring a comprehensive and diverse representation of cases.The gender distribution within our study cohort revealed that 60% of the participants were male, while 40% were female. This resulted in a male-to-female ratio of 1.77, indicating a higher prevalence of males presenting with dysphagia in the studied population.The gender-specific breakdown holds significance as it provides valuable insights into the epidemiology of dysphagia within the context of our study. The observed male predominance prompts further exploration into potential gender-related factors influencing the manifestation and presentation of dysphagia. Such gender-specific nuances are essential considerations for healthcare practitioners in devising tailored diagnostic and therapeutic strategies.The inclusion of both inpatients and those on an outpatient basis enhances the study's generalizability, capturing a diverse range of dysphagia cases.[12,13] This approach allows for a more holistic understanding of the prevalence and characteristics of dysphagia in the broader population, contributing to the collective knowledge in the field.Certainly. The diverse findings from studies conducted by Dabadghao and Kakrani, Nanda and Kochhar, and Desai et al. shed light on the intricate demographic landscape associated with dysphagia and esophageal diseases. Each study provides a unique perspective, revealing variations in mean age and gender ratios within their respective study populations.Dabadghao and Kakrani's study, with a mean age of 41.33 ± 18.3 years and a balanced male-to-female ratio of 0.58:1, suggests a relatively even distribution across genders. This finding implies that dysphagia affects both males and females, with no substantial gender predilection. The broader age range observed underscores the potential occurrence of dysphagia across various life stages.In contrast, Nanda and Kochhar's study, characterized by a lower mean age of 35 years, showcases a sex ratio of 1.6:1, indicating a higher proportion of males. This suggests a potential trend of dysphagia manifestation at a younger age, and the male predominance hints at distinct demographic patterns in their study population.

Desai et al.'s study, with a higher mean age of 55 years and a male-to-female ratio of 2.2:1, unveils a notable preponderance of males.[14] The advanced mean age in this study suggests that dysphagia might become more prevalent or clinically apparent in older age groups. The substantial male predominance could indicate gender-specific susceptibilities or healthcare-seeking behaviors within their cohort.Expanding on these findings collectively, the variations in mean age and gender ratios emphasize the multifaceted nature of dysphagia. Factors such as regional differences, lifestyle, healthcare infrastructure, and even genetic predispositions could contribute to the observed disparities. A holistic understanding of these demographic nuances is crucial for tailoring effective diagnostic and therapeutic strategies for dysphagia, ensuring that they address the diverse characteristics of affected populations. These insights also underscore the importance of continued research and collaboration to unravel the complex interplay of factors influencing the epidemiology of dysphagia across different demographic contexts.

The consistent observation of a higher incidence of esophageal carcinoma among men compared to women, as evidenced across various studies, reflects a complex interplay of lifestyle factors that influence disease prevalence. In our study, a parallel trend was observed, where men outnumbered women in cases of esophageal carcinoma.[15] This gender disparity can be largely attributed to the prevailing habits associated with an increased risk of esophageal malignancy, notably smoking, alcohol consumption, and exposure to stressful lifestyles, which were notably prevalent among male participants in our study cohort.Furthermore, our study revealed additional insights into the gender-specific risk factors contributing to esophageal carcinoma. The higher ratio of esophageal carcinoma in males was not solely attributed to smoking and alcohol intake but also correlated with the habits of chewing tobacco and inadequate meal habits. These findings emphasize the need for a comprehensive understanding of gender-specific risk factors, allowing for targeted preventive strategies and health interventions.It is intriguing to note that, in contrast to our findings, studies conducted in Western populations have reported a higher incidence of esophageal carcinoma in women. The suggested explanation for this discrepancy lies in the distinct prevalence of smoking, alcoholism, and stressful lifestyles among Western women compared to their Indian counterparts. This underscores the profound impact of cultural and lifestyle variations on disease epidemiology and underscores the importance of tailoring healthcare strategies based on regional and cultural nuances.The second most common symptom identified in our study was vomiting, consistently observed in patients with esophageal pathology.[16] This aligns with the established understanding that vomiting is a notable indicator of esophageal disorders. Interestingly, the study by Zou D et al. deviates from this trend, reporting a lower percentage of participants with reflux esophagitis experiencing vomiting and regurgitation symptoms. This discrepancy highlights the diversity in clinical presentations across different populations and emphasizes the importance of considering regional and demographic variations in symptomatology.In summary, the nuanced insights from our study, coupled with the comparative analysis of findings

from Western studies, underscore the intricate relationship between lifestyle factors, gender disparities, and symptomatology in esophageal diseases. These observations reinforce the need for a personalized and culturally sensitive approach to disease prevention, diagnosis, and management in the realm of esophageal carcinoma.

In our study, patients undergoing upper gastrointestinal endoscopy for dysphagia presented with a spectrum of associated complaints, including vomiting, retrosternal pain, and heartburn. The inclusion of these additional symptoms in our analysis provided a more comprehensive understanding of the clinical picture associated with dysphagia.[17] Comparatively, previous studies that focused on individualizing symptoms in patients undergoing endoscopy might have contributed to a higher ratio of other esophageal-associated complaints, such as vomiting and heartburn, in our study cohort.An intriguing observation in our study was the identification of tobacco chewing and smoking as primary habitual factors associated with esophageal symptoms. This finding diverges from the study conducted by William K. Hirota et al., where alcohol emerged as the primary habitual factor, with smoking being the second most common. These disparities highlight the influence of geographical and cultural factors on the prevalence of different risk factors for esophageal symptoms. The contextual variations in habitual factors underscore the importance of tailoring preventive and intervention strategies based on the specific characteristics of the population under study.Intriguingly, our study uncovered a significant association between the tradition of consuming spicy food and chewing tobacco after meals and the occurrence of esophageal symptoms, particularly among females diagnosed with carcinoma of the esophagus.[18] Notably, these contributing factors were not considered in Western studies. This underscores the importance of cultural and dietary practices in influencing esophageal health and suggests that risk factors may vary significantly across different regions and populations.The nuanced insights gained from our study emphasize the need for a holistic approach to understanding esophageal symptoms, considering not only traditional risk factors like tobacco and alcohol but also cultural practices and dietary habits. Tailoring preventive and management strategies based on these diverse factors is essential for optimizing healthcare interventions and improving outcomes, especially in populations with unique cultural and lifestyle characteristics.

CONCLUSION

The findings of our study strongly indicate a compelling association between dysphagia and certain habits, namely tobacco chewing, alcohol consumption, and smoking. The data underscores the importance of recognizing these habits as significant risk factors for the development of esophageal cancer. Importantly, the results emphasize the potential role of early diagnosis in preventing the progression to esophageal cancer, particularly by identifying premalignant lesions.The high prevalence of dysphagia among individuals engaging in tobacco chewing, alcohol consumption, and smoking suggests a potential causal link between these habits and the development of esophageal disorders. These habits, known to be associated with an increased risk of malignancy, emerge as key contributors to the manifestation of dysphagia. The identification of such habits in individuals presenting with dysphagia serves as a crucial signal for healthcare professionals to initiate further diagnostic investigations.Moreover, the implication of early diagnosis in preventing esophageal cancer highlights the significance of timely intervention. Detecting premalignant lesions during the early stages of disease progression offers a window of opportunity for effective management and prevention strategies. This could involve targeted interventions such as lifestyle modifications, surveillance, or medical treatments to mitigate the risk of malignant transformation.In essence, our study underscores the potential for primary prevention by addressing modifiable risk factors such as tobacco chewing, alcohol consumption, and smoking. Additionally, the emphasis on early diagnosis and intervention suggests that vigilant monitoring of individuals with dysphagia, especially those with associated high-risk habits, can significantly contribute to the prevention of esophageal cancer. These insights contribute to the broader understanding of the intricate relationship between lifestyle factors, symptomatology, and disease progression, ultimately guiding more effective public health initiatives and clinical interventions.

REFERENCES

1. Anatomy, sabiston textbook of general surgery, 19" edition page no 1014-17,
2. Esophagus Shwartz Principles of Surgery, 10" Edition Bhardwaj a et al: A Meta-Analysis of the Diagnostic Accuracy of Esophageal Capsule Endoscopy for Barrett's esophagus in patients with gastroesophageal reflux disease. Am J Gastroenterol 104:1533, 2009
3. CA OesophagusManngement Sabiston Textbook Of General Surgery * Edition Mecullough Tm, Jaffe D: Head and neck disorders causing dysphagia. www.GI motilityonline.com; doi:10.1038/gimo36, 2006
4. Massey B, Shaker R: Oral pharyngeal and upper esophageal sphincter motility disorders. http://www.nature.com/gimo/index.html;doi: 10. 1038/ gimo19, 2006
5. Sreedharan A, Harris K, Crellin A, et al. Interventions for dysphagia in oesophageal cancer. Cochrane Database Syst Rev. 2009;4: CD005048.
6. Krasna MJ. Advances in staging of esophageal carcinoma. Chest 1998;113(1 Suppl):107S-111S.
7. Lopez dupia M, Mora Sanz P. PintadiGrcia V. Valeciniaorgeta E, uriol PL khamaska MA et al clinical, endoscopic,immunologic . and therapeutic aspects of oropharyngeal and oesophageal candidiasis in HIV infected patients .am j enterol 1992 ;87:1771-6

8. Hetzel DJ. Healing and relapse of sevre peptic oesophagitisane treatment with omeprazole. j enterol1998 : 95 1 903-12
9. Floran Froehlich under utilization of upper gastrointestinal endoscopy .jenterol 1997.
10. Sunder rao PSS, Richard j ; an introduction to biostatics, a manual for students in health sciences, new Delhi, prentice hall of India, new Delhi.
11. Pech O, May A, Manner H, Behrens A, Pohl J, Weferling M, Hartmann U, Manner N, Huijsmans J, Gossner L. Rabenstein T, Vieth M, Stolte M. Ell C. Long-term efficacy and safety of endoscopic resection for patients with mucosal adenocarcinoma of the esophagus. Gastroenterology. 2014;146:652-660.
12. Orringer MB. Transhiatal esophagectomy without thoracotomy for carcinoma of the thoracic esophagus. Ann Surg 1984;200: 282-288.
13. William k heriota et al. study of association of risk facton of oesophageal malignancy.
14. Stark SP, Romberg MS, Pierce GE, et al. Transhiatal versus transthoracic esophagectomy for adenocarcinoma of the distal esophagus and cardia. Am J Surg 1996;172:478-482.
15. Bethge N, Sommer A, Vakil N. Palliation of malignant esophageal obstruction due to intrinsic and extrinsic lesions with expandable metal stents. Am J Gastroenterol. 1998;93:1829-1832.
16. Dabadghao VS, Kakrani AL (2015) A study of clinical and endoscopic findings in benign strictures of middle and lower thirds of esophagus. Indian J Basic Appl Med Res 5(1):752–756
17. Nanda V, Kochhar R (1986) Endoscopic dilatation of benign esophageal strictures. Indian J Gastroenterol 5(4):271–273
18. Desai DC, Swaroop VS (1992) Outpatient esophageal dilatation: an experience in 130 patients using Savary-Gilliard dilators. Indian J Gastroenterol 11(2):65–67