Original Article

Addiction history among head-and-neck cancer patients: A study to determine the cause of cancer in patients who lack addiction history

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ABSTRACT

Background: Head-and-neck cancer is one of the most common cancers around the globe, with marked prevalence in India. Being a non-communicable disease, the root cause of head-and-neck cancer is the addiction history of tobacco and alcohol. **Objective:** The present study was conducted to analyze the addiction history among head-and-neck cancer patients and to determine the cause of cancer in patients who lack an addiction history. **Methods:** Total 100 patients with head-and-neck cancer were interviewed on phone calls, and details regarding the type of cancer and addiction history were noted. For patients in which addiction history was lacking, an unstructured conversation was made to find the cause of cancer. **Results:** Among the 100 patients, 77% of patients had oral cancer, 22% of patients have larynx cancer, and only 1% of patients have maxillary cancer. Addiction history revealed that 50% of patients have a history of alcohol consumption, 35% of patients have a history of tobacco chewing, and 62% of patients have a history of smoking. Among all patients, 18% of the patients did not have any addiction history. **Conclusion:** A significant proportion of the patients do not have an addiction history, and the primary reason behind the cancer was found to be a family history of cancer, exposure to carcinogens, and diagnosis of cancer after dental surgeries.

Keywords: Addiction, alcohol, cancer, smoking, tobacco

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Introduction

Head-and-neck cancer is a significant public health concern in India, ranking as the third leading cause of mortality after lung and breast cancer. The burden of this disease is particularly pronounced due to its high incidence and mortality rates. Head-and-neck cancer encompasses a diverse range of malignancies affecting various anatomical sites, including the oral cavity, larynx, and maxillary region. Understanding the risk factors associated with the development of head-and-neck cancer is crucial for effective prevention, early detection, and management strategies.[1]

India's population is characterized by diverse cultural and socioeconomic backgrounds, leading to variations in lifestyle behaviors and exposure to risk factors. Among the well-documented risk factors for head-and-neck cancer, addiction to tobacco and alcohol consumption has consistently emerged as prominent contributors. Tobacco addiction manifests in two forms: Smoking and chewing. Smoking involves inhaling tobacco smoke, while chewing tobacco involves placing tobacco products in the oral cavity, often in the form of gutka, paan masala, or betel quid. The harmful effects of tobacco, particularly its carcinogenic properties, have been extensively studied and established.[2]

Moreover, alcohol consumption, especially in excessive amounts and over prolonged periods, has been identified as an independent risk factor for head-and-neck cancer. The association between alcohol and cancer can be attributed to the metabolic byproducts of alcohol, such as acetaldehyde, which can cause DNA damage, impair DNA repair mechanisms, and generate oxidative stress. Furthermore, alcohol consumption can synergistically interact with other risk factors, such as tobacco use, leading to a heightened risk of developing head-and-neck cancer.[3,4]

The impact of addiction to smoking, chewing tobacco, and alcohol consumption on the incidence and mortality of head-and-neck cancer in India is significant. India has a high prevalence of tobacco

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use, with many individuals engaged in smoking or tobacco chewing practices. In addition, alcohol consumption is deeply ingrained in Indian society, with use patterns varying across different regions and cultural contexts. Studies have consistently demonstrated a strong association between addiction to tobacco and alcohol consumption and the development of head-and-neck cancer. The risk is dose-dependent, with higher levels and longer durations of tobacco use and alcohol consumption correlating with an increased likelihood of disease development.[3,4]

Furthermore, addiction to tobacco and alcohol can exacerbate the adverse health effects associated with head-and-neck cancer. They can impair treatment outcomes, decrease survival rates, and increase the risk of disease recurrence. Therefore, understanding the addiction history among patients diagnosed with head-and-neck cancer is essential for tailoring treatment plans, providing appropriate support services, and implementing targeted interventions to mitigate the impact of addiction on patient outcomes.[5]

This research aims to comprehensively analyze the addiction history among patients diagnosed with head-and-neck cancer in India. By examining the prevalence and significance of tobacco and alcohol addiction in this population, we can gain valuable insights into the role of these risk factors in disease development. The present study was also conducted to determine the cause of cancer in patients who lack an addiction history.

Methodology

Study design

The present study was a prospective, observational, and descriptive study in which 100 patients with head-and-neck cancer were interviewed on phone calls.

Data collection

Each patient participated in a structured interview facilitated by a pre-structured proforma. The sociodemographic information, including age and gender, was collected. The proforma captured essential information regarding the patient's addiction history, including the type and frequency of tobacco use (chewing or smoking) and alcohol consumption. For patients in whom addiction history was lacking, the unstructured conversation was made to find the cause of cancer.

Statistical analysis

Data were analyzed using the SPSS software. A fraction of the total and percentage was used to analyze the qualitative data. Appropriate graphs were used to represent the data.

Results

Among the total 100 patients, 12% were females, and 88% were males indicating a high prevalence of head and neck cancer in males [Figure 1]. Among all patients, 77% of patients were oral cancer patients, 22% were larynx cancer patients, and there were only 1% of patients had maxillary cancer, indicating that oral cancer is the most common subtype of head-and-neck cancer following larynx cancer and maxillary cancer [Figure 2]. History of smoking was observed in 62% of patients, alcohol consumption was reported in 50% of patients, and tobacco chewing was reported in 35% of patients. Addiction history was absent in 18% of patients [Figure 3]. The primary reason behind cancer in patients who lack an addiction history was found to be a family history of cancer, exposure to carcinogens, and diagnosis of cancer after dental surgeries.

Discussion

The results of this study provide valuable insights into the addiction history among patients diagnosed with head-and-neck cancer in India.

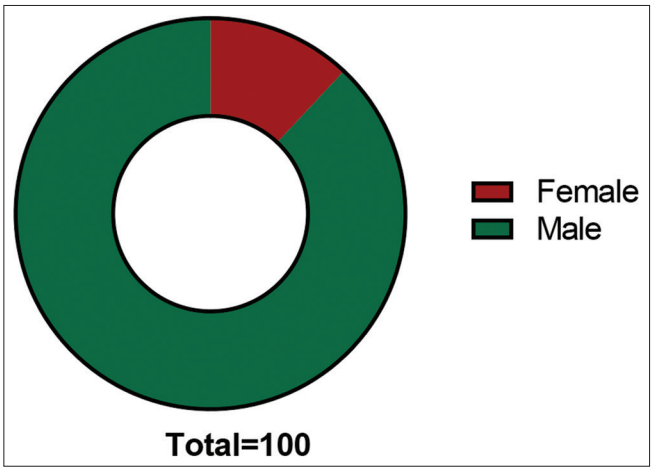

Figure 1: Sex ratio in enrolled patients indicating high male predominance

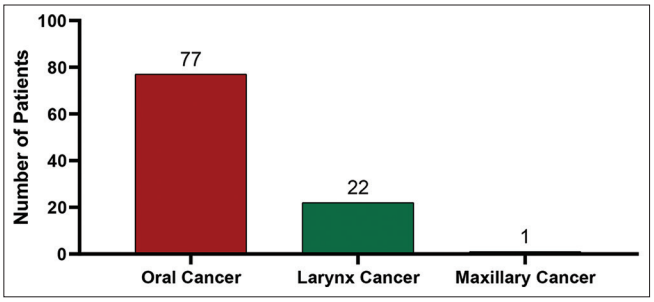

Figure 2: Type of cancer in enrolled patients indicating a high oral cancer prevalence followed by larynx and maxillary cancer

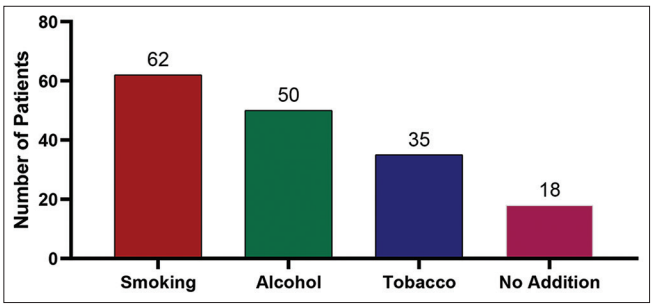

Figure 3: Addiction history in enrolled patients indicating a high prevalence of smoking, followed by alcohol and tobacco

The prevalence and patterns of addiction to tobacco and alcohol consumption shed light on the significant role of these risk factors in developing head-and-neck cancer while raising important questions about alternative or unidentified causes of the disease.

Smoking emerged as the most prevalent risk factor among the study participants, with a substantial proportion of patients reporting a smoking history. This finding is consistent with previous research, which has consistently demonstrated the strong association between smoking and various forms of head-and-neck cancer. Tobacco smoke contains numerous carcinogens, such as polycyclic aromatic hydrocarbons, nitrosamines, and volatile organic compounds, which can induce DNA damage, promote inflammation, and disrupt cellular pathways, leading to the initiation and progression of cancerous cells. The high prevalence of smoking among head-and-neck cancer patients emphasizes the urgent need for comprehensive tobacco control measures, including stricter regulations, anti-smoking campaigns, and smoking cessation programs, to reduce the disease burden.[6]

The prevalence of tobacco chewing among the study participants is also notable. Chewing tobacco exposes the oral cavity to tobacco-specific nitrosamines and other carcinogens, leading to genetic alterations and pre-neoplastic changes throughout the oral mucosa.[7] This creates an environment conducive to the growth of cancerous cells and the development of multiple primary tumors or second primary tumors within the oral cavity. The findings underscore the importance of addressing tobacco chewing practices through targeted interventions, awareness campaigns, and smoking cessation efforts.

In addition to smoking and tobacco chewing, alcohol consumption emerged as a significant risk factor for head-and-neck cancer among the study participants. The association between alcohol consumption and the risk of head-and-neck cancer has been well-documented, with heavy and prolonged alcohol use substantially increasing the likelihood of disease development.[8] Alcohol acts as a solvent, facilitating the absorption of tobacco-related carcinogens into the mucosal tissues of the aerodigestive tract. Moreover, alcohol itself can induce genetic and epigenetic changes, leading to the initiation and promotion of cancerous cells. These findings highlight the importance of comprehensive strategies to reduce alcohol misuse and promote responsible drinking practices, which can contribute to the prevention and management of head and neck cancer.

The concept of field cancerization is also pertinent to the discussion of head and neck cancer. Field cancerization refers to the phenomenon where the entire mucosal field in a specific anatomical region is exposed to carcinogens and undergoes genetic and epigenetic changes that make it susceptible to cancer development.[9] In the context of head and neck cancer, prolonged exposure to tobacco smoke, alcohol, and other carcinogens can lead to the transformation of multiple sites within the aerodigestive tract. The genetic alterations and pre-neoplastic changes induced by tobacco exposure affect the entire oral mucosa, creating a field at risk for cancer development.[10] Thus, interventions to reduce tobacco use and promote oral health are crucial in preventing and managing oral cancer.

Interestingly, a significant proportion of patients (18%) did not have a documented addiction history, suggesting the presence of alternative risk factors or unidentified causes for head-and-neck cancer. Patients who lack an addiction history face more significant psychological strain due to high shame and stigma as other individuals hold the patient responsible for the disease, which is caused by unknown means.[5,11-18] Further research is warranted to investigate other potential factors contributing to the development of this disease among patients without a history of addiction. Such investigations could shed light on genetic predispositions, environmental factors, occupational exposures, or other lifestyle behaviors that may influence the risk of head and neck cancer. By unraveling the underlying mechanisms and identifying additional risk factors, future studies can provide a more comprehensive understanding of the etiology of head-and-neck cancer, leading to improved prevention, early detection, and management strategies.

Conclusion

This study underscores the significant association between addiction to smoking, chewing tobacco, and alcohol consumption with the development of head-and-neck cancer in India. Smoking emerged as the most prevalent risk factor, followed by alcohol consumption and tobacco chewing. The findings emphasize the pressing need for awareness initiatives to educate individuals about the detrimental effects of these addictive behaviors on their health. By disseminating information, implementing tobacco cessation programs, and promoting responsible alcohol use, public health campaigns can empower individuals to make informed decisions and adopt healthier lifestyles, ultimately reducing the burden of head-and-neck cancer. In addition, further research should be conducted to explore other potential risk factors among patients without a documented addiction history. By uncovering alternative causes and risk factors, health-care policymakers and practitioners can develop targeted interventions, preventive measures, and personalized treatment strategies to address the complexities of head-and-neck cancer in India.

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