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ASSOCIATION OF ETHNICITY AND CARCINOGEN WITH HEAD AND NECK CANCERS

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ABSTRACT

Objective: *The purpose of this study is to review the complex relationship between the risk of head and neck cancer, exposure to carcinogens, and ethnicity.*

Study design: *Cross sectional study*

Place and duration of study: *This study is performed at ENT department of PNS Shifa hospital Karachi from January 2023 to July 2023*

Methodology: *A group of 220 patients who were presented at the outdoor department were selected after analyzing their eligibility on the basis of predefined criteria of inclusion and exclusion. All the patients with age between 18 to 85 years of either gender were included in this study.*

Results: *The study included individuals with a mean age of 51.0 years (± SD 11.4), comprising 62.27% males and 37.73% females. The ethnic breakdown of biopsy-confirmed head and neck carcinoma cases revealed that 49.55% identifying as Urdu and varying percentages for Sindhi, Pashton, Balochi, Punjabi, and others. The carcinogen exposure data indicates significant usage of betel nuts (70.9%), gutka (65%), pan (79%), tobacco (83.6%), and naswar (74.09%) among participants, emphasizing the prevalence of various risk factors within the study population.*

Conclusion: *This study has concluded that the incidence of head and neck of carcinomas has strong association with ethnicity and the exposure to various carcinogens like betel nut, tobacco, Naswar and gutka.*

Keywords: *Ethnicity, head and neck carcinoma, carcinogens*

INTRODUCTION

A broad category of tumors that impact different parts of the body, such as the oral cavity, pharynx, larynx, and paranasal sinuses, is referred to as head and neck cancers (HNC) [1]. A combination of hereditary and environmental variables is major contributors to the complex etiology of HNC[2]. Two important factors that have been shown to affect the occurrence, course, and consequences of HNC are ethnicity and exposure to carcinogens. In order to better understand the relationship between ethnicity, carcinogen exposure, and the risk of head and neck cancers, a literature review has been conducted[3].

The prevalence and death rates of HNC vary between ethnic groups, as research repeatedly reveals. Certain ethnic groups, such those descended from South Asia, may be more susceptible to particular kinds of head and neck malignancies, according to studies [4]. The observed inequalities in cancer epidemiology can be attributed to a combination of socioeconomic variables, cultural behaviors, and genetic predispositions [5]. Therefore, it is imperative to take ethnicity into account as a major determinant.

The development and spread of head and neck cancers are significantly influenced by carcinogens, both environmental and lifestyle-related. Consumption of alcohol and tobacco products is a known risk factor, and there is a positive correlation between the two in those who use them together [6]. Furthermore, it has come to light that a major carcinogenic factor is human papillomavirus (HPV) infection, especially in cases of oropharyngeal malignancies. The etiological landscape is made more complicated by occupational exposures, such as those in businesses that use asbestos and certain chemicals [7].

To comprehend the varying susceptibilities to HNC, researchers have focused on the interaction between ethnicity and carcinogen metabolism [8]. The metabolism of tobacco-related carcinogens involves enzymes such cytochrome P450, which contain genetic variations that have been linked to different ethnic groups [9]. Ethnic differences in HNC risk may be influenced by these variables, which may also affect an individual's reaction to carcinogen exposure [10].

Strategic preventative and intervention measures are essential, given the complex link that exists between ethnicity, exposure to carcinogens, and HNC [11]. Reducing the prevalence of HNC can be facilitated by culturally sensitive public health campaigns, smoking cessation initiatives, and HPV vaccination campaigns, especially in high-risk ethnic regions [12]. The development of tailored strategies for cancer prevention can also benefit from knowledge of the genetic factors of carcinogen metabolism [13].

This review of the research emphasizes the complex relationship between the risk of head and neck cancer, exposure to carcinogens, and ethnicity. In order to create preventative, early detection, and intervention techniques that work, it is imperative to acknowledge these intricacies [14]. To identify the precise genetic and environmental variables causing ethnic differences in HNC and to provide tailored therapies for groups that are at risk, more study is necessary.

Methodology

It is a cross sectional study performed at ENT department of PNS Shifa hospital Karachi from January 2023 to July 2023. The approval of ethical review committee (ERC/2023/ENT/61) was taken before the study. A group of 220 patients who were presented at the outdoor department were selected after analyzing their eligibility on the basis of predefined criteria of inclusion and exclusion. All the patients with age between 18 to 85 years of either gender were included in this study. All the biopsy proven cases were included in the study and any patient with co-morbidity; any other malignancy or memory issues were excluded from this study. Similarly, patients with incomplete medical records and with known genetic conditions or syndromes that increases the risk of head and neck carcinomas was not included in this study. Individuals who had recently undergone any treatment for head and neck carcinoma were also excluded to avoid any confounding effects. All the patients ere briefed about the methods involved on the study and informed written consent was taken. Similarly, history was taken from each patient on the basis of a pre-designed Performa with information about use of any carcinogen like tobacco, betel nut, gutka, pan and naswar, duration of addiction and amount of consumption. The address details were also notes for each patient along with biopsy report, staging of carcinoma and history of any treatment taken.

The data analysis was conducted using the Statistical Package for Social Sciences (SPSS) version 23:00. For quantitative variables, the calculations were mean and standard deviation; for qualitative variables, the calculations were frequencies and percentages. The p value of less than or equal to 0.5 was considered significant.

Result

The results of this study have shown that Individuals with a mean age of 51.0 years (± SD 11.4) made up the study population. Gender distribution showed that 62.27% of the population was male and 37.73% was

female. The ethnic composition of the population who were biopsy confirmed cases of head and neck carcinomas was varied; 49.55% identified as Urdu, while other ethnic groups included Sindhi (19.55%), Pashton (9.55%), Balochi (8.18%), Punjabi (5.45%), and others (7.73%) with a p value of 0.02 as shown in table I and figure I . This data gives a thorough overview of the demographic mix and emphasizes how different ethnic groups are represented in the research. Such data must be included in order to comprehend any differences in health outcomes across various ethnic groups and to enable a more sophisticated interpretation of the study's conclusions.

The distribution of biopsy-confirmed cases across different anatomical areas is varied, according to the statistics on head and neck carcinomas. With 44.09% of the 220 cases, the buccal mucosa was the most common location, followed by the cheek with 37.72% of cases involving carcinoma (CA). Additional locations included the floor of the mouth (1.37%), the hard palate (0.45%), the larynx (5.0%), and the tongue (11.36%) (P value 0.01). The study population's carcinomas' TNM staging provides additional insight into the kind and severity of cancer cases. Interestingly, most instances were found at stages 3 (48.64%) and 4 (35.91%) as shown in table II, indicating that many of these malignancies were advanced when they were discovered.

The tabulated data on exposure to carcinogens provide important information on the prevalence of different risk factors in the research population. A significant percentage of individuals reported using betel nuts, with 70.9% saying "Yes" and 29.1% saying "No." Of those, 65% reported using betel nuts, while 35% reported not using them. 79% of subjects reported using pan, a mixture of areca nut and betel leaf; whereas 21% said they did not. Of the participants, 83.6% acknowledged using tobacco, a known carcinogen. Only 17.4% said they did not use tobacco. Of the participants, 74.09% reported using naswar, while 25.91% said they did not use it (P value 0.03) as shown in table III and figure II.

Discussion

The data collected gives a thorough overview of the demographic mix and emphasizes how different ethnic groups are represented in the research and their relationship with incidence and frequency of head and neck carcinoma. Such data must be included in order to comprehend any differences in health outcomes across various ethnic groups and to enable a more sophisticated interpretation of the study's conclusions [15]. This analysis has shown that head and neck carcinomas were most common in Urdu speaking ethnic groups followed by Sindhi, Pashton, Balochi and other groups.

Comprehending the stage distribution plays a crucial role in prognostic assessments and in customizing suitable treatment strategies for individual patients [16]. By shedding light on the tumors' histological features, this data advances our knowledge of their biological makeup and their aggressiveness. In conclusion, the thorough information provided on biopsy-confirmed cases, TNM staging, and degree of differentiation clarifies the complex characteristics of head and neck carcinomas in the population under study, enabling researchers and clinicians to have a more sophisticated understanding of the illness.

Given that betel nut use is common in this demographic and it has been linked to cancer, public health initiatives and awareness campaigns should take this into serious consideration [17]. In light of the established health hazards linked to gutka, including as a heightened susceptibility to oral malignancies, our findings emphasize the significance of focused prevention efforts and intervention programs for those abusing this detrimental agent [18]. Comparably, the study's inclusion of Pan emphasizes the complex relationship between carcinogen exposure and the necessity for all-encompassing approaches to address the different cultural practices that raise the risk of cancer. The high prevalence highlights the ongoing difficulty of tobacco-related health problems and highlights the importance of smoking cessation programs and anti-smoking activities in this demographic [19]. The high frequency of Naswar use underscores the variety of tobacco exposure scenarios in this demographic and underscores the significance of comprehensive tobacco control strategies that address both smokeless and smoked tobacco products [20].

To sum up, this study on carcinogen exposure offers a thorough picture of the frequency of different risk variables in people who have head and neck cancers. The results highlight the critical need for focused

public health initiatives to lower the incidence of cancer, address these risk factors, and enhance general population health.

Conclusion:

This study has concluded that the incidence of head and neck of carcinomas has strong association with ethnicity and the exposure to various carcinogens like betel nut, tobacco, Naswar and gutka. The findings underscore the urgent need for targeted public health interventions to mitigate these risk factors, reduce cancer incidence, and improve overall community health.

Limitations

The study's findings may have limitations in terms of generalizability due to the specific demographic and geographic characteristics of the study population. The reliance on self-reported data for certain variables, such as carcinogen exposure, introduces the potential for recall bias. Despite efforts to control for confounding variables, there may be unmeasured factors that could influence the observed association between ethnicity, carcinogen exposure, and head and neck cancers. Variables such as genetic predispositions, occupational exposures, and lifestyle factors may not have been adequately accounted for in the study. Hence more thorough and exhaustive investigation on this issue is the need of the hour.

Conflict of interest

None

Acknowledgement

To doctors and staff of PNS al-shifa hospital

Table I: Demography and Ethnicity of population

Variables	Result
Age in years (mean ± SD)	51.± 11.4
Gender	
Male	137 (62.27%)
Female	83 (37.73%)
Ethnicity	
Sindhi	43(19.55 %)
Balochi	18(8.18%)
Pashto	21 (9.55%)
Punjabi	12 (5.45%)
Urdu	109 (49.55%)
Others	17(7.73%)

Figure I: Ethnicity of study population

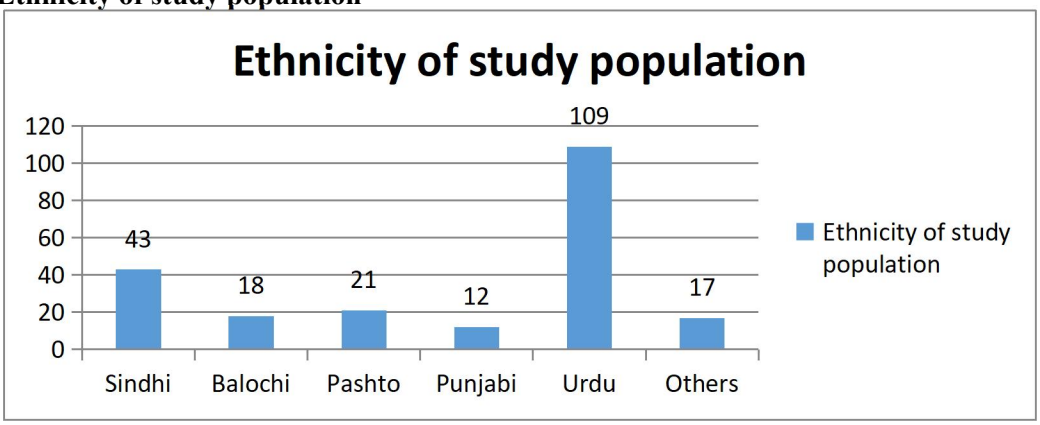


Table II: analysis of head and neck carcinomas

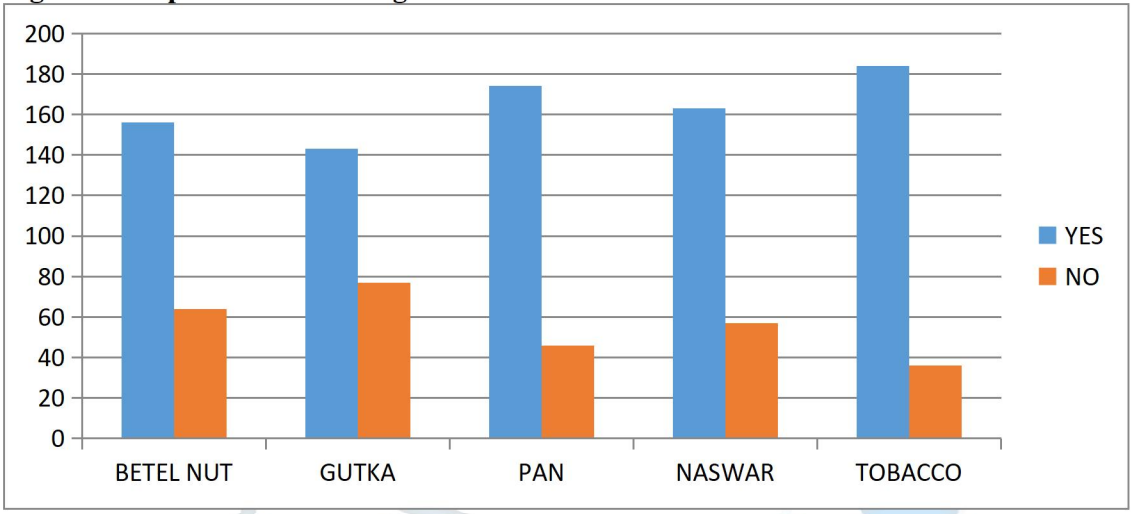
Variables	**Frequency**
Biopsy confirmed cases (n=220)	
Buccal mucosa	97 (44.09%)
CA cheek	83 (37.72 %)
CA larynx	11 (5.0%)
Floor of the mouth	3 (1.37%)
Hard palate CA	1 (0.45%)
CA tongue	25 (11.36%)
TNM Staging of the CA (n=220)	
2	34 (15.45%)
3	107(48.64%)
4	79 (35.91%)
Degree of differentiation	
Well differentiated	71 (32.27%)
Moderately differentiated	103 (46.82%)
Poorly differentiated	46 (20.91%)

Table III: Carcinogen Exposure

Carcinogen exposure	
Variable	Frequency (n=220)
Betel nut • Yes • No	 156(70.9%) 64 (29.1%)
Gutka • Yes • No	 143(65%) 77(35%)
Pan • Yes	 174(79%) 46(21%)

• No	
Tobacco • Yes • No	 184 (83.6%) 36 (17.4%)
Naswar • Yes • No	 163(74.09%) 57(25.91%)

Figure II: Exposure to Carcinogen



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CONSENT FORM

I agree to participate in the study titled:

ASSOCIATION OF ETHNICITY AND CARCINOGEN WITH HEAD AND NECK CANCERS

I have been informed about the study's possible benefits and side effects. I understand that my participation is voluntary, and I am free to withdraw from the study whenever I want to I have been told that my doctor will continue to give me all possible care and treatment even if I start the study.

I allow my doctor to take my blood sample to perform tests on it for research purposes. Furthermore, I allow my doctor or any other person authorized by my doctor to contact me at my home or at an address given by me for treatment and follow to be used for research purposes. I have been assured that the information I provided will be kept confidential and used for research purposes only.

Patient Name: _____ Witness Name_____
CNIC#: _____ CNIC#: _____
Signature: _____ Signature _____
Date: _____ Date: _____

Doctor's Signature: _____
Date: _____

CONSENT FORM
رضا مندی نامہ برائے شمولیتِ تحقیق

ASSOCIATION OF ETHNICITY AND CARCINOGEN WITH HEAD AND NECK CANCERS

ڈاکٹر نےمجھے اس طبی تحقیق کے بارے میں تفصیلاً آگاہ کر دیا ہے اور میں اس تحقیق میں شامل ہونے کے لیے رضامند ہوں۔ مجھے بتا دیا گیا ہے کہ میری ذاتی اور طبی معلومات کے علاوہ مجھے اپنے خون کے نمونے فراہم کرنا ہوں گےجن پر کچھ لیبارٹری ٹیسٹکئے جائیں گے۔
میں جانتا/جانتی ہوں کہ اس تحقیق میں شمولیت سے مجھ پر کوئی خطرناک اثرات مرتب نہیں ہوں گے۔
میں رضاکارانہ طور پر اس تحقیق کا حصہ بن رہا/ رہی ہوں۔ میں کسی بھی وقت اس تحقیق سے قطع تعلقی اختیار کر سکتا/کرسکتی ہوں۔ اور میرے علاج معالجہ پر اس عمل سے کوئی اثر نہیں پڑے گا۔
مجھے بتا دیا گیا ہے کہ اس تحقیق سے مجھے کوئی مالی فائدہ حاصل نہیں ہوگا۔
علاوہ ازیں میں یہ بات اچھی طرح سمجھتا ، سمجھتی ہوں کہ میری ذاتی اور طبی معلومات کو محفوظ اور صیغۂ راز میں رکھا جائے گا۔

مریض کا نام _____ :گواہ کا نام_____

شناختی کارڈ نمبر _____ : شناختی کارڈ نمبر_____:

دستخط_____ : دستخط_____ :

تاریخ_____ : تاریخ_____ :

دستخط معالج _____تاریخ___ _____ :

ASSOCIATION OF ETHNICITY AND CARCINOGEN WITH HEAD AND NECK CANCERS
BIODATA
NAME: _____ S/O, D/0, W/O: _____
AGE: _____ GENDER: M/F PHONE: _____
COMORBIDS: _____
ADRESS: _____
PERMANENT: _____
TEMPORARY: _____
DURATION: _____

HISTORY
CARCINOGEN:
1.
2.
3.
DURATION OF ADDICTION:
1.
2.
3.
CONSUMPTION
1. PER DAY

2. ALTERNATE DAY
3. WEEKLY

INVESTIGATION:
1. BIOPSY: _____
_____
2. CT SCAN: _____
_____
DIAGNOSIS: _____
STAGING TNM:_____

SURGERY:
WLE
FROZEN SECTION
REPAIR
NECK DISSECTION
DATE OF SURGERY
SURGICAL CIMPLICATIONS: _____
_____
DURATION OF COMPLICATION: _____
_____
TREATMEN GIVEN: _____
_____
POST-OP HISTOPATHOLOGY: _____
_____
_____FOLLOW UP:
_____
_____
CHEMO/RADIOTHERAPT STATUS: _____
NO OF CYCLES
CHEMOTHERAPY DRUGS

COMPLICATIONS OF RADIOTHERAPY: _____
_____
_____