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A Clinicopathological Analysis of Head and Neck Squamous Cell Carcinoma in Medical City, Baghdad

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ABSTRACT

Background: Squamous cell carcinoma of the head and neck (HNSCC) develops from the epithelium lining the larynx, hypopharynx, oropharynx, and oral cavity. This study sought to determine the prevalence of head and neck squamous cell carcinoma among patients presenting at the medical city hospitals in Baghdad, Iraq.

Methods: Between February 2024 and February 2025, 90 patients with HNSCC (as determined by clinical examination and histopathological diagnosis) and 90 healthy participants were chosen at random from among those who visited their patients at National Al-Amal Hospital for Oncology, Teaching Oncology Hospital, and Baghdad Center for Radiation – Medical City (Baghdad, Iraq) as part of this case control study. Every participant's data was acquired. These comprised their profile's laboratory tests for histological diagnosis, age, sex, length, weight, smoking, family history, cancer kind, and concomitant conditions**.**

Results: The patients' mean age was 55.26±15.85 years, which was considerably greater than the controls' mean age of 51.12±10.59 years. While controls had a more balanced male-to-female ratio (58.89% male, 41.11% female), HNC patients are overwhelmingly male (82.22%), with ($p = 0.001$). Compared to 8.89% of controls, a much larger number of HNC patients (45.56%) were smokers, a difference that was highly significant ($p < 0.001$). A positive family history of cancer was slightly more common in HNC patients (23.33%) than in controls (15.56%), There is no substantial variation ($p =0.187$).

Conclusions: Male more predisposed to infected with HNSCC, and smoking consider risk factor for HNSCC, nasopharyngeal carcinoma is the commonest HNSCC in this study.

Keywords: Clinicopathological; Head and neck Squamous cell carcinoma;

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INTRODUCTION:

Head and neck cancers are a broad range of site-specific malignancies that frequently exhibit aggressive characteristics, for over 325,000 deaths and 660,000 new cases yearly, creation them the seventh most prevalent cancer diagnosed universally [1]. The epithelium that lines the oral cavity, hypopharynx, oropharynx, and larynx is the source of head and neck squamous cell cancer (HNSCC), As the most prevalent histological subtype, head and neck squamous cell carcinomas (HNSCCs) account for up to 90% of HNCs [2-3]. HNCs are prevalent as the 18th most common type of cancer to be diagnosed and the ≥11th most common cause of cancer-related deaths in the Gulf Cooperation Council countries [1]. The range of head and neck cancer incidence is 9.8% to 40% when compared to cancers of the overall body. It is well established that lifestyle choices have a significant impact on health outcomes. The World Health Organization (WHO) estimates that unhealthy lifestyle choices account for about one-third of fatalities. Two lifestyle variables that increase the risk of head and neck cancers (HNC) include smoking and drinking alcohol that are unquestionably linked to the disease's complex etiology [4]. Human papillomavirus (HPV) is expected to overtake tobacco as the leading cause of HNSCC cancer globally, making oropharyngeal HNSCC more common than oral cancer, which usually coexists with tobacco use, HNCs have been observed in people who do not smoke or drink [5-6]. The evolution of Oral Squamous Cell Carcinoma(OSCC) is also influenced by genetic mutations, infections, and dietary variables. OSCC is also influenced by epigenetic changes, including non-coding RNAs, histone acetylation, DNA methylation, and chromatin remodeling [7]. Socioeconomic status undoubtedly contributes to the risk; HNCs have been observed in people who do not smoke or drink. Additionally, It seems that oropharyngeal cancer is most likely related to the human papillomavirus [8]. The rising rate of cancer (including HNCs) is placing a great deal of financial pressure, significant psychological suffering, and unique functional impairments on individuals, communities, and healthcare systems. However, patients frequently experience a range of psychological issues, which are strongly linked to a lower quality of life [9-10-11]. Other risk factors for squamous cell head and neck cancer include poor dental hygiene, inadequate nutrition. Chronic periodontitis and other oral infections and inflammation have also been related to an increased risk of HNC [12]. exposure to carcinogens in the workplace or environment (such wood dust or asbestos), and genetic predisposition to the various hallmarks of cancer: Replicative immortality, escaping immune destruction, preventing cell death, deregulating cellular energetics, maintaining proliferative signals, avoiding growth suppressors, encouraging tumor inflammation, initiating invasion and metastasis, and triggering angiogenesis are all examples of genomic instability [13]. An elevated risk of HNC was also linked to a low body mass index (BMI) and a family history of the disease. It was discovered that using condoms reduced the risk of HNC regardless of oral HPV. Exposure to hormones, specifically menarche before the age of 13, was linked to a lower incidence of HNC in women. Fruits, vegetables, tea, and coffee consumption were not linked to HNC [14]. The head and neck region is rich in lymphatic tissue, primarily in the thyroid, mouth cavity, Waldeyer's ring, and salivary glands. The head and neck are ideal anatomical locations for the emergence of lymphoproliferative diseases because of the 200–300 lymph nodes that surround them

[15]. In indigenous communities, nasopharyngeal carcinoma (NPC) has been endemic. in the Middle East, North Africa, the Arctic, and East and Southeast Asia. This malignancy's endurance in some geographic areas indicates that stable environmental risk factors and/or genetics play a significant role in its development. This further complicates the etiology of NPC by involving the Epstein-Barr virus (EBV) in its pathogenesis [16]. Laryngeal carcinoma is linked to significant patient morbidity and a high death rate. According to historical research, laryngeal cancer incidence was declining, but death was not improving at the same rate. Thus, the goal of the current study was to ascertain the distribution of head and neck cancer by age, gender, cancer type, and various risk factors in Medical City during 2024–2025.

Materials and methods The study design

A case-control study achieved on the prevalence of head and neck cancer in the region accomplished in oncology center and Al-amal Hosital for Oncology/ Medical city in Baghdad /Iraq. Head and neck cancer patients from February/ 2024 to February/ 2025. During this dated, a total of 90 patients were data collected and 90 healthy individuals was collected randomly from persons who visited their patients. Prior to their participation in the study, all groups provided their documented consent. The Scientific and Ethical approval to perform the research acquired from College of Medicine, University of Tikrit: 3/7/223 in 26/5/2024.

Data collection

Direct interviews were conducted with each participant using a pre-made questionnaire to gather demographic information, including body mass index (BMI), age, and sex, residency, family history of malignancies, and comorbidities. The recent study comprising HNSCC patients involving larynx, nasopharyngeal and oropharyngeal carcinoma and others squamous cell carcinoma. Clinical characteristics of patients including type of infection, treatment, histological stage and lymph node metastasis also was obtained from patient's profiles.

Statistical analysis

The investigations were performed using SPSS 25.0 (SPSS, Chicago), a statistical program. The mean and standard deviation of continuous data displayed, and the Student t-test utilized for analysis. The Chi-square test utilized to assess categorical variables, which reported as numbers and percentages. Any change that deemed If the p-value was less than 0.05, it was viewed as to be significantly different.

Results

Demographic features of the patients

Table 1 displays the association of demographic factors with HNC. The mean age of the patients was 55.26±15.85 years which was higher than that of controls (51.12±10.59 years) with a significant difference. The majority of HNC patients are male (82.22%), whereas controls have a more balanced male-to-female ratio (58.89% male, 41.11% female). This difference is extremely important ($p = 0.001$). The mean BMI in HNC patients (25.03±3.81 kg/m²) is similar to that of controls (25.13±3.76 kg/m²), with no significant difference ($p = 0.819$). In contrast, significantly higher percentage of HNC patients (45.56%) were excurrent smokers compared with 8.89% of controls has a very notable distinction ($p < 0.001$). The majority of both HNC patients (70%) and controls (67.78%) live in urban areas, with no significant difference ($p = 0.747$). A positive family history of cancer was slightly more common in HNC patients (23.33%) than in controls (15.56%), However, the distinction fails to reach

statistically significant (p = 0.187). Hypertension was more common in HNC patients (28.89%) compared to controls (20%), with no significant difference (p = 0.165). In contrast, T2DM was slightly lower in HNC patients (14.44%) compared to controls (21.11%), with no significant association (p = 0.242).

Variables	Frequency	Percentage
Type of cancer		
Laryngeal	30	33.33%
Nasopharyngeal	41	45.56%
Tongue	9	10%
Oropharyngeal	6	6.67%
Others	4	4.44%
Lymph node metastasis		
No	77	85.56%
Yes	13	14.44%
Histopathological stage		
I-III	79	87.78%
IV-V	11	12.12%

Clinical characteristics of the patients with HNC

The most prevalent kind of cancer among the patients is nasopharyngeal cancer (45.56%), followed by laryngeal cancer (33.33%), while tongue (10%),

Table 1: Demographic and clinical features of the study population

Variables	Patients (n=90)	Controls (n=90)	P value
Age, years			
Mean±SD	55.26±15.85	51.12±10.59	**0.041**
Range	9.0-85	16.0-82	
Sex			
Male	74(82.22%)	53(58.89%)	**0.001**
Female	16(17.78%)	37(41.11%)	
BMI (kg/m^2)			
Mean±SD	25.03±3.81	25.13±3.76	0.819
Range	18.78-34.37	20.34-31.46	
Smoking			
Yes	41(45.56%)	82(91.11%)	**<0.001**
No	49(54.44%)	8(8.89%)	
Residence			
Urban	63(70%)	61(67.78%)	0.747
Rural	27(30%)	29(32.22%)	
Family history			
No	69(76.67%)	76(84.44%)	0.187
Yes	21(23.33%)	14(15.56%)	
Comorbidities			
Hypertension	26(28.89%)	18(20%)	0.165
DM	13(14.44%)	19(21.11%)	0.242

BMI: body mass index, DM: diabetes mellitus

oropharyngeal (6.67%), and other types (4.44%) are less frequent. The majority of patients (85.56%) have no lymph node metastasis, whereas only 14.44% did. Regarding histopathological staging, most patients are in stages I-II (87.78%), with only 12.12% classified as stage III-IV (Table 2). Figure1 explained tongue cancer of NNSCC.

Table 2: clinical characteristics of patients with HNSCC

Variables	Frequency	Percentage
Type of cancer		
Laryngeal	30	33.33%
Nasopharyngeal	41	45.56%
Tongue	9	10%
Oropharyngeal	6	6.67%
Others	4	4.44%
Lymph node metastasis		
No	77	85.56%
Yes	13	14.44%
Histopathological stage		
I-III	79	87.78%
IV-V	11	12.12%

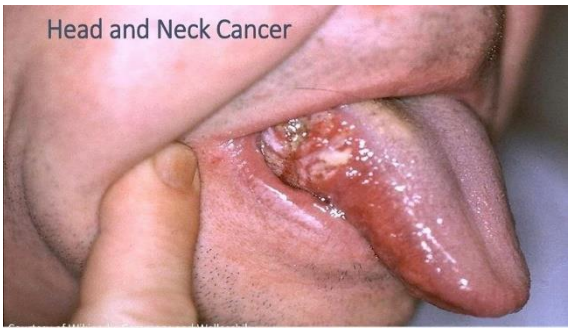

Figure 1: Patient with tongue cancer

Discussion

This case-control study examines the prevalence of malignant tumors of the head and neck in relation to clinical pathological and demographic variables in Medical City, Baghdad. Malignancies of head and neck involve several histological types and sites, and in our study, the larynx, oropharyngeal, nasopharyngeal, tongue and others squamous cell carcinomas were assessed. According to the study, around two-thirds of the cases in both sexes were diagnosed at or

above the age of 55 compared controls with a significant difference. The sixth decade of life was actually the most prevalent age group, with the seventh decade coming in second. As a result, malignant head and neck cancers were less likely in young people under 40, which was in line with findings from other research [17-18-19-20]. almost all of HNC patients are male (82.22 %). While the male-to-female ratio among controls is more balanced (58.89% male, 41.11% female). which somewhat matches findings from earlier research that showed men were more impacted than women, however the majority of these studies had a larger ratio of men to women [20-21-22]. The male preponderance may be explained by certain behaviors that have been identified as risk factors for head and neck cancers, such as alcoholism and smoking, which are strongly linked with male gender and, to a lesser extent, may be explained by the protective qualities of estrogen exposure in females [23]. Our report reflects with previous study carried out by Hamideh Kadeh *et al*. revealed that head and neck cancers were more common in women [24]. This study showed that the significantly higher percentage of HNC patients were smokers compared controls with a highly significant difference ($p < 0.001$). This report line with other previous studies [25-26]. Tobacco contains a variety of carcinogenic substances, such as polycyclic aromatic hydrocarbons, nitrosamines, aromatic amines, and aldehydes. These substances are produced by burning at high temperatures and are known to harm oropharyngeal cells' DNA, which can result in cancer [27]. Heavy smokers are 5–25 times more likely to develop HNSCC than nonsmokers [28]. As a solvent, alcohol raise the vulnerability of mucosal tissue to toxins such as dietary nitrites and smoking. Alcohol dehydrogenase, which converts ethanol to acetaldehyde, has also been shown to be mutagenic. Disulfiram and other drugs with comparable properties, such as abacavir or metronidazole, inhibit the conversion of acetaldehyde, which causes many of the symptoms of excessive alcohol use, such as flushing and headaches. This explains why people respond when they drink [29]. In this report, the majority of patients with HNC (70%) and controls (67.78%) reside in cities that agree partially with Another study clarified the urban populations had a higher risk of dying from OSCC, while rural populations showed better overall survival [30]. The top four sites implicated by head and neck squamous cell carcinoma encompassed tongue, laryngeal, nasopharyngeal, oropharyngeal carcinoma, the nasopharynx is the commonest site. The result similar to previous study announced the cancer of nasopharynx is the prevalence [24-31], and disagrees with study that reported the oral carcinoma is the commonest [32]. The Heavy smokers more likely to develop HNSCC. Disulfiram and other drugs with comparable properties, such as abacavir or metronidazole, inhibit the conversion of acetaldehyde, which causes many of the symptoms of excessive alcohol use, such as flushing and headaches. This explains why people respond when they drink [29].

There may be various environmental elements that are significant. Certain regions may be more important for biologic agents, such viruses or fungus, while others may be more important for physical or chemical agents, or a combination of variables may cause the cancer. Inhaling polynuclear hydrocarbons or consuming nitrosamine-like substances may be important in some places, whereas these external agents may only work when paired with a viral infection—possibly the Epstein-Barr virus—or with a specific nutritional or hormonal condition [33].

In this study, patients diagnosed with HNSCCs were presented the nasopharyngeal carcinoma more prevalence than the others cancers and the disease were more common in people over 50, indicating that the risk of cancer generally rises with age. Furthermore, smoking considers risk factor of cancer.

Conclusions: HNSCC remains a significant health concern in Iraq, with nasopharyngeal carcinoma being the most prevalent type in the studied cohort. The findings emphasize the role of male gender and smoking as prominent risk factors. Enhanced public health awareness and early screening strategies are recommended.

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