



EPIDEMIOLOGICAL ASPECTS AND DEMOGRAPHIC PROFILE OF HEAD AND NECK SQUAMOUS CELL CARCINOMAS: EXPERIENCE FROM A TERTIARY CARE CENTRE IN TELANGANA.

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ABSTRACT

Background: Head and neck squamous cell carcinoma (HNSCC) represents a major global health burden, particularly in South and Southeast Asia. India reports one of the highest incidence rates worldwide, largely due to high prevalence of tobacco-related habits and the rising burden of HPV-associated malignancies. **Objectives:** To evaluate the epidemiological and demographic profile of patients diagnosed with HNSCC at a tertiary care centre and assess associations between risk factors, anatomical sites, and HPV status. **Materials And Methods:** A cross-sectional observational study was conducted in the Department of Pathology at a tertiary care hospital in Telangana. Medical records of 207 histopathologically confirmed HNSCC patients, aged 20–100 years, diagnosed between January and June 2024 were reviewed. Data on age, sex, and risk factors (tobacco chewing, smoking, and alcohol consumption) were collected. HPV association was assessed using p16 immunohistochemistry. Statistical analysis was performed to identify relevant correlations. **Results:** A male preponderance was noted, consistent with previous Indian studies. The mean age at diagnosis was 58 years, with most cases occurring between the fifth and sixth decades. The oral cavity was the most frequently affected site, with the tongue being the predominant sub-site (31.4%), followed by the glottis (18.8%) and vocal cords (16.4%). Tobacco chewing was the most common risk factor among women, whereas smoking and alcohol consumption predominated among men. HPV association (p16 positivity) was observed in 67% of cases. Additionally, 13.5% of patients presented with nodal metastasis at initial evaluation. **Conclusion:** HNSCC incidence appears to be increasing, with the highest burden among males aged 51–60 years. The predominant risk factors include smoking and alcohol use in men and tobacco chewing in women. Strong HPV association highlights the need for early screening and widespread HPV vaccination. Comprehensive public health interventions addressing behavioral risk factors and promoting HPV vaccination are essential for reducing disease burden.

KEYWORDS :

INTRODUCTION

Head and neck squamous cell carcinoma (HNSCC) encompasses a heterogeneous group of malignancies arising from squamous epithelium lining the oral cavity, pharynx, larynx, nasal cavity, paranasal sinuses, salivary glands, and ear. Globally, HNSCC contributes significantly to cancer-related morbidity and mortality, with an estimated 900,000 new cases and 400,000 deaths annually.^[1] Incidence rates are highest in South and Southeast Asia^[2], followed by Central and Eastern Europe and South America. India carries one of the heaviest burdens of HNSCC, where tobacco use alone accounts for up to 80% of all cases.^[3]

Shifting lifestyle patterns-including increased use of smokeless tobacco, smoking, alcohol consumption, and rising prevalence of HPV-related oropharyngeal cancers-have contributed to increasing incidence, particularly among younger populations.

This study evaluates the epidemiological features and demographic trends of HNSCC cases diagnosed at a tertiary care hospital in Telangana, India.

AIMS AND OBJECTIVES

1. To evaluate the epidemiological profile of patients with HNSCC.
2. To assess associations between demographic variables, anatomical sites, and risk factors and HPV status.
3. To support awareness and development of targeted preventive strategies.

MATERIALS AND METHODS

A cross-sectional observational study was conducted in the Department of Pathology at a tertiary care hospital in Telangana. Medical records of 207 patients with

histopathologically confirmed HNSCC diagnosed between January and June 2024 were reviewed.

Inclusion Criteria:

Patients aged 20–100 years. Histopathologically confirmed HNSCC cases.

Data Collection:

Demographic information (age, sex) and risk factors (tobacco chewing, smoking, alcohol consumption) were recorded. HPV association was assessed using p16 immunohistochemistry, a validated surrogate marker for HPV infection.

Statistical Analysis:

Descriptive statistics were used to summarize demographic and clinical characteristics.

RESULTS AND DISCUSSION

Demographic Profile

A clear male preponderance was seen, which is in comparison with study done by Michaelraj, Minu J et al^[4] in 2023 and previous other regional and national studies.

The mean age at presentation was 58 years, with most cases occurring in the fifth and sixth decades of life.

Site Distribution: (Table 1)

Site	Frequency	Percentage
Tongue	65	31.4%
Buccal mucosa	20	9.7%
Hypopharynx	17	8.2%
Palate	11	5.3%
Posterior pharyngeal wall	8	3.9%
Tonsillar fossa	5	2.4%

Oropharynx	3	1.4%
Nasopharynx	1	0.5%
Cricopharynx	1	0.5%
Glottis	39	18.8%
Vocal cords	34	16.42
Nasal cavity	2	0.96%
Ear	1	0.5%

The oral cavity was the most commonly affected site, with the tongue as the predominant sub-site (31.4%), followed by the glottis (18.8%) and vocal cords (16.4%).(table 1. These findings align with patterns reported in other Indian studies.^[4]

Risk Factors

It was observed that tobacco chewing was the most common addiction among women ,whereas among men it was primarily smoking and alcohol consumption. These observations correspond with similar studies conducted in South India.[Table2]

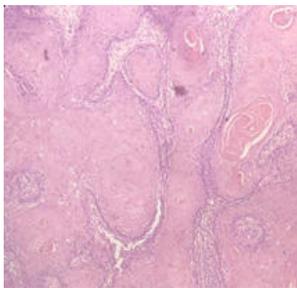
Table 2: Distribution Of Risk Factors In Relation To Patient Sex

ADDICTION	MALES	FEMALES	TOTAL
Only Smoking	30 (16.9%)	6	36
Only Tobacco	34 (19.2%)	13(43.3%)	47
Only Alcohol	8	2	10
Smoking + Alcohol	56 (31.6%)	1	57
Smoking + Tobacco	6	0	6
Tobacco + Alcohol	13	1	14
Sm + T + A	4	0	4
No Addictions	26	7	33

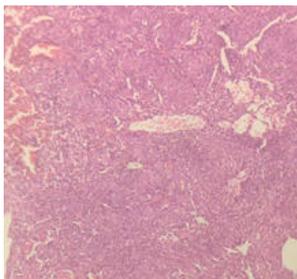
HPV Association:

p16 is a well-established surrogate marker of HPV activity, with strong prognostic implications. The Immunohistochemical expression of p16 was determined by scoring the intensity of nuclear and cytoplasmic staining and percentage of cells showing positivity.The cases that showed nuclear positivity(2+/3+)and staining atleast 75% of tumorcells were considered p16 immunopositive as per the AJCC (American Joint Committee on Cancer)criteria.^[5]

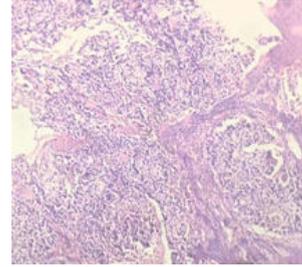
p16 immunohistochemistry revealed HPV positivity in 67% in the present study.(figure 1.) Irrespective of histological grade of the tumor, HPV association (p16 expression) was seen in all grades of tumors(Table 3). Another study done by Vidhyadhara rani et al ^[6] showed 78.8%positivity(out of 52 cases).



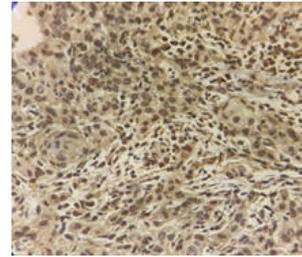
(a)



(b)



(c)



(d)

Figure 1. (a)Well differentiated scc (b)Moderately differentiated scc (c)Poor differentiated scc (d) Expression of p16

Histological grade	TOTAL CASES	P16 expression (67%)	P16 negative (33%)
Well	174	116 (66.7%)	58 (33.3%)
Moderate	28	20 (71.4%)	8(28.5%)
Poor	5	3 (60%)	2 (40%)
Total	207	139 (67%)	68 (33%)

Additional Findings:

13.5% (28 cases) presented with nodal metastasis at initial evaluation.

Histological grading: 174 were Well-differentiated SCC, 28 were Moderately differentiated SCC, and 5 Poorly differentiated SCC.

There was increased intensity of expression of p16 seen among moderately differentiated tumors.

Common presenting symptoms in the present study included ulceroproliferative lesions, dysphagia, and hoarseness of voice.

Risk Factor Mechanisms:

Tobacco contains over 5,000 chemicals, including carcinogenic polycyclic aromatic hydrocarbons such as benzo(a)pyrene and nitrosamines. Alcohol acts synergistically with tobacco, acting as a solvent for carcinogens and metabolizing into acetaldehyde, which forms DNA adducts that contribute to carcinogenesis.^[7]

CONCLUSION

This study highlights a rising incidence of HNSCC, particularly among males aged 51–60 years. Smoking and alcohol consumption were the predominant risk factors in men, whereas tobacco chewing was more common among women. HPV association was strong, underscoring the need for HPV vaccination and early screening.

Raising awareness about modifiable risk factors and implementing large-scale public health interventions-including tobacco cessation programs and HPV vaccination-are vital for reducing the disease burden.

Identifying and screening high-risk individuals enables early detection and timely intervention.

WHO recommends HPV vaccination as part of routine

immunization. In the United States, vaccination reduced oral HPV prevalence by 88.2%.

HPV vaccination of children and young adults before exposure has the potential to significantly reduce, or even eliminate, HPV-positive HNSCC.

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