ORIGNAL ARTICLE

Demographic Profile of Head and Neck Malignancy in Northeast India: A Retrospective Study

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ABSTRACT

Introduction: Head and neck cancers (HNCs) are the sixth most common malignancy worldwide, with 57.5% of the global burden occurring in Asia, particularly in India, particularly in the north-eastern region where genetic, environmental and lifestyle-related risk factors are significant contributors.

Methods: A retrospective study was carried out, collecting data from Hospital base's cancer clinic registry for the period of January 2024–June 2025.

Results: Total of 552 patient data were collected, among them males are more prevalent than female, with elder people of age 45–60 years of age were more affected by cancer. The majority of patients were from Assam (78.6%), followed by Nagaland (16.8%), with sporadic cases from other states of the North east. The most common malignancy was found to be oral cavity carcinoma (25.5%), followed by hypopharyngeal carcinoma (10.1%), oropharyngeal carcinoma (8.9%), laryngeal carcinoma (7.8%), and nasopharyngeal carcinoma (7.4%). Among benign or non-malignant lesions, multinodular goitre (3.8%), lipoma (2.3%), and pleomorphic adenoma (2.3%) are predominated. Miscellaneous tumors accounted for 18.5%.

Discussion: This one and half year study highlights that head and neck cancers in North-East India mostly affect males in their middle to late adulthood, with oral cavity carcinoma being the most prevalent subtype. Assam and Nagaland contribute the highest case burden.

Conclusion: High number of cases, with wide verities of malignancies rises concern and needs targeted awareness, early screening initiatives, and region-specific cancer control policies. Strengthening tobacco cessation programs and early detection pathways could improve long-term outcomes.

INTRODUCTION

Head and neck cancers (HNCs) are the sixth most common malignancy worldwide, with 57.5% of the global burden occurring in Asia, particularly in India.[1] In India, HNCs account for 30–40% of all cancers.[2] The Indian Council of Medical Research (ICMR) Cancer Atlas project reported that incidence in Assam, Meghalaya, Mizoram, Manipur, and Nagaland is higher than the rest of India.[3] Mizoram has the highest incidence of lower pharyngeal and tongue cancers in men worldwide, while Nagaland records one of the world's highest incidence rates of nasopharyngeal carcinoma.[4,5] Kamrup, Assam, has the highest age-adjusted incidence rates for oropharyngeal and hypopharyngeal cancers,[6] while in Meghalaya, HNCs and esophageal cancers together account for 70.67% of all malignancies.[7]

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Lifestyle factors, particularly tobacco and areca nut use, contribute substantially to this disproportionate burden.

Among Indian HNC patients, 86.5% were tobacco users and 23.2% alcohol users, with combined exposure resulting in a five-year survival of only 29%.[8] Genetic and epigenetic variations also distinguish Northeast Indian populations; around 30% of Indian HNC patients harbor Ha-ras or N-ras mutations uncommon in Western cohorts.[9,10] In Meghalaya, unique methylation patterns—hypermethylation of FLT3 and EPB41L3, and hypomethylation of SFN—have been observed.[11]

Despite advances in management, 60–80% of Indian patients present with advanced disease compared to 30% in developed nations, leading to poor survival.[12,13] In this context, institution-based incidence data from Northeast India are vital to guide targeted screening, prevention, and treatment strategies.

OBJECTIVES

To analyze the demographic, geographical, gender, age, and histological distribution of head and neck cancer cases presenting to the department of Otorhinolaryngology between 2024 and 2025

METHODS

This was a retrospective study conducted at AIIMS Guwahati over one and half year period (JAN 2024– June 2025).

Inclusion criteria

All the patient presented to AIIMS Guwahati Head and neck Tumor Board with definitive HPE report.

Data Collection

Patient records were retrieved from hospital-based cancer registries.

Data collected included: Demographics (age, sex, residence)

Primary tumor site

RESULTS

Total of 552 patients data were collected from the hospital-based cancer registry for the period of one and half year (Jan 2024 – June 2025). Out of the total cases 362(65.6%) were male and 190 (34.4 %) were female.

Table 1: no of cases per year

Year	Frequency	Percent
2024	232	42.0
2025	320	58.0
Total	552	100.0

Table 2: gender distribution of diseases

	Frequency	Percent
FEMALE	190	34.4
MALE	362	65.6
Total	552	100.0

Table 3: prevalence of diseases

	Frequency	Percentage
Ca Oral cavity	141	25.5
Ca Hypopharynx	56	10.1
Ca Larynx	43	7.8
Ca Nasopharynx	41	7.4
Ca Oropharynx	49	8.9
Ca Thyroid	33	6.0
Haemangioma	12	2.2
Lipoma neck	13	2.4
Multinodular Goitre	21	3.8
Pleomorphic adenoma	13	2.4
Solitary thyroid nodule	16	2.9
Unknown Primary	12	2.2
Miscellaneous	102	18.5
Total	**552**	**100.0**

Our study shows that among the patient presented to us most common malignancy is Carcinoma oral cavity 141 (25.5%) of cases followed by ca hypopharynx 56 (10.1%), carcinoma Larynx 43(7.8%) cases, followed by Ca nasopharynx, ca oropharynx, ca thyroid and miscellaneous respectively. Among all the cases, 328(60%) cases were malignant, where as 224(40%) cases were benign. Multinodular goiter (3.8%), lipoma (2.3%), and pleomorphic adenoma (2.3%) predominated in the benign cohort. Miscellaneous tumors accounted for 18.5%.

Diseases	Total number	Percentage
Benign	224	40%
Malignant	328	60%

Age distribution: The 45–59 years group formed the largest cohort (35.9%), followed by 60–74 years (26.6%). Only 2.3% of cases were seen in patients <18 years. Mean age was 53.4 years (2024) and 49.6 years (2025), with an overall shift towards younger age groups in 2025. Younger patients (18–44 years) had relatively higher incidence of thyroid-related tumors and nasopharyngeal cancer, whereas middle-aged and elderly patients were dominated by oral cavity and hypopharyngeal cancers

Table 4: No of cases distributed as gender and age category

Age Category	Gender	Frequency	percentage
Less than 18 Years	Female	8	61.5
	Male	5	38.5
	Total	**13**	**100.0**
18-44 (Young people)	Female	72	44.2
	Male	91	55.8
	Total	**163**	**100.0**
45-59 (Middle aged person)	Female	65	32.8
	Male	133	67.2
	Total	**198**	**100.0**
60-74 (Young old people)	Female	37	25.2
	Male	110	74.8
	Total	**147**	**100.0**
75 years and above (Aged)	Female	8	25.8
	Male	23	74.2
	Total	**31**	**100.0**

Geographic distribution: The majority of patients were from Assam (78.6%), followed by Nagaland (16.8%), with sporadic cases from other northeastern states.Most of the Carcinoma of oral cavity, hypopharynx and larynx were from Assam, however Ca nasopharynx cases were predominantly from Nagaland.

Table 5: prevalence of diseases among the different states

State		Frequency	Percent
Arunachal Pradesh	Nasopharynx	1	100
Assam	Ca Oral cavity	117	27
	Ca Hypopharynx	42	9.7
	Ca Larynx	35	8.1
	Nasopharynx	14	3.2
	Ca Oropharynx	44	10.1
	Ca Thyroid	20	4.6
	Hemangioma	12	2.8
	Lipoma neck	13	3
	Multinodular Goitre	18	4.1
	Pleomorphic adenoma	13	3
	Solitary thyroid nodule	14	3.2
	Unknown Primary	10	2.3
	Miscellaneous	82	18.9
	Total	**434**	**100**
Bihar	Ca Thyroid	1	50
	Multinodular Goitre	1	50
	Total	**2**	**100**
Manipur	Ca Oral cavity	1	25
	Ca Hypopharynx	1	25
	Ca Thyroid	1	25
	Miscellaneous	1	25
	Total	**4**	**100**
Meghalaya	Ca Oral cavity	4	40
	Ca Hypopharynx	1	10
	Ca Larynx	1	10
	Ca Oropharynx	2	20
	Ca Thyroid	1	10
	Miscellaneous	1	10
	Total	**10**	**100**
Mizoram	Miscellaneous	1	100
Nagaland	Ca Oral cavity	19	20.4
	Ca Hypopharynx	11	11.8
	Ca Larynx	7	7.5
	Nasopharynx	26	28
	Ca Oropharynx	3	3.2
	Ca Thyroid	10	10.8
	Multinodular Goitre	2	2.2
	Unknown Primary	2	2.2
	Miscellaneous	13	14
	Total	**93**	**100**
Odisha	Miscellaneous	1	100
Sikkim	Solitary thyroid nodule	2	100
Tripura	Miscellaneous	2	100
Uttar Pradesh	Miscellaneous	1	100
West Bengalcooch Bihar	Ca Hypopharynx	1	100

DISCUSSION

In this retrospective study conducted at AIIMS Guwahati, out of 552 cases, 25.5% cases were constituted by oral cavity malignancies, this finding is similar to the national trend of around 30-40%.[2] At the global level, the oral cavity cancer burden is significant, with about 355,000 new cases and 177,000 deaths in 2018. India recorded around 120,000 new cases that same year, which was the highest among all countries.[14]

Nasopharyngeal cancer (NPC) comprised 7.4% of all the cases in our cohort, emerging as the second most common subsite. This is not surprising as Northeast region has been flagged as the high-incidence zone for NPC, especially among the people from Nagaland and Mizoram. The etiological factors include the genetic predispositions, dietary habits consisting of smoked meats, and Epstein Barr virus (EBV) infection.[15]

The Population based Cancer registry (PBCR) data shows high prevalence of Hypopharyngeal cancer in our region which is similar to our study where Hypopharyngeal cancers accounted for 10.1% of cases while laryngeal cancers amounted to 7.8%.[3,6] The predominance of this malignancy can be attributed to the widespread habit of smoking, alcohol consumption and late presentation due to lack of public awareness and ignorance[8,12], in contrast to the western countries where most oropharyngeal cancers are HPV driven.[8,16]

The incidence of thyroid malignancies has been rising over the years, which reflects improved screening, diagnostics and referral pattern to tertiary centers. In our study, 6% cases were contributed by Thyroid malignancies.

We have also seen high prevalence of miscellaneous carcinomas, these subtypes highlight the heterogeneity of HNCs in Northeast India. Beyond subsite distribution, we focused on additional insights into age and gender trends. The peak incidence was between 45–59 years (35.9%), followed by 60–74 years (26.6%), together comprising nearly two-thirds of the cases. This trend is similar to the Indian data which highlights the peak incidence of malignancies in middle to late adulthood, which points to the cumulative exposure of carcinogens at this age group.[12,13] However, almost one third (29.5%) of cases occurred in young adults (18–44 years), which is alarming but consistent with the recent reports of rise in oral cancer among younger population in India, likely due to the widespread use of tobacco (Gutkha and pan masala). [18-20]

Gender distribution showed a significant tilt towards the males, notably the older age group. Males constituted 67.2% of cases in those aged 45–59 years, which rose to 75% in 60 years and above. The susceptibility of males to oral cancers, esp HNSCCs is well documented in Epidemiology, which reflects the lifestyle and behavioral risk factors among men, including smoking and alcohol consumption.[8]

CONCLUSION

This study delivers institution-based evidence on the distinct head and neck cancer epidemiology in Northeast India. A predominant portion of HNCs consists of oral cavity cancers, followed by a carcinoma of the Hypopharynx. Middle-aged males were mostly affected by cancers. The observations from our study provide us with a broad understanding regarding the incidences of HNCs and its demographic profile. A rising trend in case numbers, coupled with a noticeable shift towards younger patients in 2025, underscores the urgent need for targeted awareness, early screening initiatives, and region-specific cancer control policies. Strengthening tobacco cessation programs and early detection pathways could improve long-term outcomes.

REFERENCES

1. Chaturvedi P. Head and neck surgery. J Cancer Res Ther. 2009;5:143.
2. Bhattacharjee A, Chakraborty A, Purkaystha P. Prevalence of head and neck cancers in the north east–An institutional study. Indian J Otolaryngol Head Neck Surg. 2006;58:15–9.
3. Nandakumar A. National Cancer Registry Programme. Consolidated Report of the Population Based Cancer Registries: Incidence and Distribution of Cancer: 1990–96. Bangalore: ICMR; 2001.
4. Ganapati M. India has some of the highest cancer rates in the world. BMJ. 2005;330:215.
5. Mudur G. India has some of the highest cancer rates in the world. BMJ. 2005;330:215.
6. Nandakumar A, Gupta PC, Gangadharan P, Visweswara RN, Parkin DM. Geographic pathology revisited: Development of an atlas of cancer in India. Int J Cancer. 2005;116:740–54.
7. Shunyu NB, Syiemlieh J. Prevalence of head and neck cancer in the state of Meghalaya: Hospital-based study. Int J Head Neck Surg. 2013;5:74–7.
8. Patil VM, Noronha V, Joshi A, Agarwal J, Ghosh-Laskar S, Budrukkar A, et al. A randomized phase 3 trial comparing nimotuzumab plus cisplatin chemoradiotherapy versus cisplatin chemoradiotherapy alone in locally advanced head and neck cancer. Cancer. 2019;125:3184–97.
9. Paterson IC, Eveson JW, Prime SS. Molecular changes in oral cancer may reflect aetiology and ethnic origin. Eur J Cancer B Oral Oncol. 1996;32:15–23.
10. Michmerhuizen NL, Birkeland AC, Bradford CR, Brenner JC. Genetic determinants in head and neck squamous cell carcinoma and their influence on global personalized medicine. Genes Cancer. 2016;7:182–200.
11. Khongsti S, Shunyu BN, Ghosh S. Promoter-associated DNA methylation and expression profiling of genes (FLT3, EPB41L3 & SFN) in patients with oral squamous cell carcinoma in Khasi & Jaintia population of Meghalaya, India. Indian J Med Res. 2019;150:584–91.
12. Lohia N, Bhatnagar S, Singh S, Prashar M, Subramananiam A, Viswanath S, et al. Survival trends in oral cavity cancer patients treated with surgery and adjuvant radiotherapy in a tertiary center of Northern India. SRM J Res Dent Sci. 2019;10:26–31.
13. Mishra A, Singh VP, Verma V. Environmental effects on head and neck cancer in India. J Clin Oncol. 2009;27 (suppl; abstr e17059).
14. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018;68:394–424.
15. Sharma TD, Phukan RK, Zomawia E, et al. High incidence of nasopharyngeal carcinoma in Northeast India: epidemiological perspectives. Indian J Cancer. 2013;50:316–21.

16. Gillison ML, Koch WM, Capone RB, et al. Evidence for a causal association between human papillomavirus and a subset of head and neck cancers. J Natl Cancer Inst. 2000;92(9):709–20.

17. Gupta B, Johnson NW, Kumar N. Global epidemiology of head and neck cancers: a continuing challenge. Oncology. 2016;91(1):13–23.

18. Sharma P, Saxena S, Aggarwal P. Trends in incidence of oral cancer in younger age groups in India: a hospital-based study. Indian J Cancer. 2018;55:282–6.

19. D'Cruz AK, Vaish R, Dhar H. Patterns of head and neck cancer in younger patients: analysis of Indian cancer registries. South Asian J Cancer. 2019;8:83–6.

20. Boffetta P, Hecht S, Gray N, Gupta P, Straif K. Smokeless tobacco and cancer. Lancet Oncol. 2008;9:667–75.

21. Mathur P, Sathishkumar K, Chaturvedi M, et al. Cancer statistics, 2020: report from National Cancer Registry Programme, India. JCO Glob Oncol. 2020;6:1063–75.