



**ORIGINAL RESEARCH PAPER**

**Pathology**

**PREVALENCE OF HEAD AND NECK MALIGNANCIES IN NORTH MAHARASHTRA: AN INSTITUTIONAL STUDY**

**KEY WORDS:** Total body malignancy, Head and neck cancer, Prevalence

**Dr Rajeshree R Gaware**

Assistant Professor, Dept. of Pathology, SMBT Institute of Medical Sciences and Research Centre, Igatpuri, Nashik

**Dr Kunal S Deore\***

Assistant Professor, Dept. of Pathology, SMBT Institute of Medical Sciences and Research Centre, Igatpuri, Nashik \*Corresponding Author

**Dr Shubhangi S Rairikar**

Associate Professor, Dept. of Pathology, SMBT Institute of Medical Sciences and Research Centre, Igatpuri, Nashik

**ABSTRACT**

In India, head and neck cancers (HNCA) account for 30-40% cancers at all sites. In North-Maharashtra, where this study was conducted, tobacco related oral cancer is very common which may be due to widespread habit of using smokeless tobacco. The lack of any study in this regard and alarmingly high prevalence of cancers of head and neck in this part of Maharashtra has prompted us to take up this study. A retrospective study on prevalence of cancer in various head and neck regions like oral cavity, oropharynx, larynx, oesophagus, nasal cavity and Paranasal sinuses was conducted in Department of Pathology, SMBT Institute of Medical Sciences and Research Centre, Igatpuri, Nashik from January 2017 to June 2019. The prevalence is found to be significantly high at 30.63%, affecting males more than females in the age group of 40-69 years. Oral cavity cancer constituted a major burden of total body malignancy (TBM). This study aims to analyze the spectrum of HNCA and should help as a starting point for a much needed population based study in this region. A comprehensive effort is needed to identify the cause of such high prevalence, generate awareness and treatment options suited to meet this challenge.

**INTRODUCTION**

Oral cancer is the most common cancers in the Indian Subcontinent, commonest in India. In India, head and neck cancers (HNCA) account for 30-40% cancers at all sites, out of which 9.4% being oral cancers. It is the sixth common cause of death in males and seventh in females. In the present study, prevalence of HNCA was found to be higher than cancer in other sites. Carcinoma oral cavity formed the largest group. The morbidity and mortality associated with this disease is a cause of major concern in this region. Many factors that are implicated for its causation are consumption of tobacco in its various forms, alcohol, smoking habits, lack of awareness, and lack of proper nutrition.

**MATERIALS AND METHODS**

A retrospective study on prevalence of cancer in various head and neck regions like oral cavity, oropharynx, larynx, oesophagus, nasal cavity and Paranasal sinuses was conducted in Department of Pathology, SMBT Institute of Medical Sciences and Research Centre, Igatpuri, Nashik from January 2017 to June 2019. Only histopathologically confirmed cases were included in the study.

**RESULTS AND DISCUSSION**

During this 2.5 year period, a total of 395 cases of total body malignancies (TBM) were seen. Out of this, 121 cases were of malignancies of the head and neck region. According to various studies, the prevalence of HNCA with respect to total body malignancies varies from 9.8% to 54.48%. [11,12,14,15,19-21] In our study, the prevalence was 30.63%. Such high prevalence in this region is indicative of several factors that predispose to HNCA. The use of smokeless tobacco, lime, betel and smoking is a very common oral habit prevalent in this region which may be one of the prominent causes. Although there is no previous study available, the present data points to an alarmingly high prevalence of HNCA in this region.

The commonest HNCA obtained was oral cavity cancer comprising of 87 cases (72%) followed by oesophageal and oropharyngeal carcinomas comprising of 5 cases (4.1%) and

4 cases (3.3%) respectively [Figure 1]. Oral cavity cancer comprised of 22% of TBM. Carcinoma of ear and scalp was the least common. With respect to oral cavity and oropharynx the commonest site involved was buccal mucosa (67%).

**Age and gender distribution**

The commonest age group is fourth decade comprising of 43 cases (35.54%) [Table 1]. 22.3% cases were from the age group 50-59 years and 19% in 60-69 years. 9% cases (n=11) were from the age groups 30-39 years and 70-79 years each. 2.5% cases (n=3) were from the age groups 20-29 years and > 80 years each. Similar observations were reported in various other literatures. [15,19-21]

Commonest cancer in the fourth decade is oral cavity cancer comprising 35 out of 43 cases. Esophageal cancer is commonest from the age 30-69 years. Oropharyngeal carcinoma was seen in 20-59 years age group. Hypopharyngeal and laryngeal cancers are seen mostly in fourth, fifth and sixth decades.

In the gender distribution, male cases were far more common than female comprising of 74 males to 47 females, (1.57:1) [Table 2,3]. Oral cavity cancer is the commonest both in males (n=58) as well as in females (n=29). This male:female ratio is same as in the other studies ranging (1.5:1 to 2.9:1). [14,15,19-21] Males formed more than 68% of oral cavity and oropharyngeal cancer cases, the buccal mucosa being the most commonly involved site followed by tongue, soft palate and retromolar trigone. The male predominance is due to the fact that males are more exposed to habit of smoking and tobacco chewing, and of their increased awareness and accessibility to health-care service.

On the other hand, oral cavity cancer is also the commonest head and neck cancer among the females because of the wide spread use of 'masheri' which is a powdered form of roasted tobacco used for cleaning teeth in this region. As the male:female ratio in the general population census is 1.06:1, the predominance of HNCA in males was found to be statistically highly significant.

**Table 1: Number of cases of HNCA in relation to age**

Age Group	Oral cavity	Face	Nose & PNS	Esop-hagus	Orop-harynx	Hypop-harynx	Lary-nx	Paro-tid	Ear	Scalp	Total (%)
20-29	2	0	0	0	1	0	0	0	0	0	3 (2.5)
30-39	7	0	2	1	1	0	0	0	0	0	11 (9)
40-49	35	1	1	2	1	1	0	1	0	1	43 (35.5)
50-59	18	2	2	1	1	1	2	0	0	0	27 (22.3)
60-69	16	3	1	1	0	1	0	1	0	0	23 (19)
70-79	9	1	0	0	0	0	0	0	1	0	11 (9)
80+	0	3	0	0	0	0	0	0	0	0	3 (2.5)
Total	87	10	6	5	4	3	2	2	1	1	121

**Table 2: Number of cases of HNCA in relation to age (Females)**

Age Group	Oral cavity	Esop-hagus	Nose & PNS	Hypop-harynx	Face	Parotid	Scalp	Larynx	Total (%)
20-29	1	0	0	0	0	0	0	0	1 (2.13)
30-39	5	1	2	0	0	0	0	0	8 (17)
40-49	7	2	0	1	0	1	1	0	12 (25.5)
50-59	5	1	1	1	0	0	0	1	9 (19.1)
60-69	9	0	1	1	2	1	0	0	14 (29.8)
70-79	2	0	0	0	1	0	0	0	3 (6.4)
Total	29	4	4	3	3	2	1	1	47

**Table 3: Number of cases of HNCA in relation to age (Males)**

Age Group	Oral cavity	Face	Orop-harynx	Nose & PNS	Esop-hagus	Larynx	Ear	Total (%)
20-29	1	0	1	0	0	0	0	2 (2.7)
30-39	2	0	1	0	0	0	0	3 (4)
40-49	28	1	1	1	0	0	0	31 (41.9)
50-59	13	2	1	1	0	1	0	18 (24.3)
60-69	7	1	0	0	1	0	0	9 (12.1)
70-79	7	0	0	0	0	0	1	8 (10.8)
80+	0	3	0	0	0	0	0	3 (4)
Total	58	7	4	2	1	1	1	74

**Histopathological pattern**

Squamous cell carcinoma (SCC) was the commonest histological type in HNCA comprising of 87.6% cases [Table 4]. It is followed by basal cell carcinoma (6.6% cases). Similar results were reported in other studies, values ranging from 88.1% to 95.5%. [17,19,21] SCC is also the commonest type seen in Esophageal (100%), laryngeal (100%) and hypopharyngeal (100%) cancers. In the cancers of oral cavity only one case of mucoepidermoid carcinoma of minor salivary gland on hard palate was seen, the rest being SCC. Basal cell carcinoma was the most common histological type in cancers of the face constituting 8 out of 10 cases reported. All the 3 cases of malignant salivary gland tumor are Mucoepidermoid carcinoma. 4 cases of inverted papilloma of nose were also encountered.

**Pattern of malignancies at various sites**

Oral cavity is the commonest HNCA observed in this study comprising of 22% TBM much higher than the other studies showing 8.87-10.5% of TBM [10,18-21] and male: female ratio of 2:1 similar to other studies with male: female ratio of 1.6:1 to 3.9:1. [20,21] Oral cavity cancer is also the most common site of HNCA in females. Oral cavity constitutes 72% of HNCA which is very much higher than other studies comprising of 16.28-28.2% of HNCA. [10,18-21] Squamous cell carcinoma (SCC) is the most common histology seen (98.8%). S. Thakur et al (2001) and Manjari et al (1996) reported it to be 93.3% to 95%. The dominant site involved was the buccal mucosa (70.1%) which is similar to that reported by Ajay et al. [22] The tongue was involved in 29.9 % of the cases which is much less than as reported by Singh et al (1965) (49.13%). About 76.85% of cases in this study were between 41 to 60 years of age which is higher than other studies. [2,6,19,21]

Face: It is second most common site accounting for 8.26% of HNCA and 2.53% of TBM with male: female ratio of 2.33:1. Most common histological type is Basal cell carcinoma comprising of 80% of the cases.

Esophageal cancer is the third commonest site accounting for 1.2% of TBM and 4.1% of HNCA. The male: female ratio being 1:4 which is very less than the other studies comprising of 3.8% to 10.58% of TBM with male: female ratio ranging from 1.3:1 to 5.1:1. [12,14,15,18,20,21]

Oropharyngeal cancer: It is the fourth commonest site involved comprising of 1% of TBM and 3.3% of HNCA, with all the cases seen in males. In a study by S. Thakur et al (2001), oropharyngeal carcinoma was reported to be the third commonest (7.3% of TBM and 16.9% of HNCA) with male: female ratio of 3.4:1. Other study ranges from 6.6% to 28.62% of HNCA with male: female ratio ranging from 0.7:1 to 8.3:1. [11,15,17,21] This may be due to tobacco chewing, smoking and consumption of pan masala (flavouring agents taken along with betel leaf and betel-nut); more seen amongst male. The commonest histological type seen in such cases is SCC comprising of 100% which is similar to other studies (93.3% to 98.2%). [19-21]

Hypopharyngeal carcinoma is the fifth commonest of HNCA comprising of 0.76% of TBM and 2.5% of HNCA with all the three cases reported in females. Other workers have reported it to be 2.3% to 7.7% of TBM and 11.7% to 28.3% of HNCA [1,15,17,19-21] and the male: female ratio of 3.6:1 to 5.8:1. [15,20,21] Here too, SCC is the commonest histological type comprising of 100% cases similar to as reported by S. Thakur (2001), (97.8%) and A. Bhattacharjee et al (2006), (99.37%). The maximum number of cases were in the age group between 40-69 years of age, as similar to other studies. [13,19,21]

Laryngeal carcinoma is the sixth commonest of HNCA comprising of 0.5% of TBM and 1.65% of HNCA with male: female ratio of 1:1. Various workers have reported it to be 1.4-12.1% of TBM and 11.3-26.85% of HNCA [14,19-21] with male: female ratio in the range of 3.34:1 to 11.5:1. [3,8,14,15,18-21] Gangadharan et al (1997) and Jussawalla et al (1984) have

correlated the development of laryngeal carcinoma with smoking habits. Maximum number of such cases was seen between age group of 51-60 years similar to as observed by Iwamoto (1972) and S.Thakur (1993).

Nose and PNS: It is also sixth commonest site comprising of 1.65% of HNCA and 0.5% of TBM with male:female ratio of 1:2. Studies have reported carcinoma of nose and PNS in the range

of 0.9-2.4% of TBM[11,19-21] and 5.9-11.55% of HNCA[9,15,19-21] with M:F ratio between 1.5:1-3.38:1.[5,11,15,19,21] Histologically, there were two cases of SCC and four cases of inverted papilloma. [Table 4]

Carcinoma of ear and scalp were the least effected comprising of only 0.82% of HNCA and barely 0.25% of TBM. This figure is close to as reported by SThakur et al (0.3%).

**Table 4: Histopathological types of Head and Neck Malignancy**

Types	Oral cavity	Face	Nose & PNS	Esophagus	Oropharynx	Hypopharynx	Larynx	Parotid	Ear	Scalp	Total (%)
SCC	86	2	2	5	4	3	2	0	1	1	106 (87.6)
Basal cell ca	0	8	0	0	0	0	0	0	0	0	8 (6.6)
Inv. Pap.	0	0	4	0	0	0	0	0	0	0	4 (3.3)
Muco-epi. ca	1	0	0	0	0	0	0	2	0	0	3 (2.5)
Total	87	10	6	5	4	3	2	2	1	1	121

SCC: Squamous cell carcinoma, Inv. Pap.: Inverted Papilloma, Mucoepi. ca: Mucoepidermoid carcinoma

**CONCLUSION**

This study shows that, the prevalence of head and neck cancers is significantly high at 30.63%. Majority of HNCA are histologically squamous cell carcinoma affecting the age group 40-69 years with males outnumbering females (1.57:1). Therefore, HNCA constituted a major burden of total body cancers in our institute with similar prevalence as reported in other studies. The numbers of cases with involvement of oral cavity (72%) are very much high both in males as well as females as compared to other studies. This finding is indicative of a pertinent fact that HNCA is a condition quite common in this part of Maharashtra which requires prompt attention. The increasing number of HNCA cases is a cause of major concern as it is associated with high morbidity and mortality in a sizeable population. Factors involved are poor socioeconomic condition, oral consumption of tobacco in its various forms, use of lime with betel-leaf and betel-nuts, alcohol and smoking habits. The wide spread use of 'masheri,' which is a powdered form of roasted tobacco used for cleaning teeth by both, males as well as females in this region can also be considered as a significant risk factor equally affecting both the sexes. Over and above, lack of awareness about cancer and non-existent cancer prevention programmes have all made the scenario even worse. This study hopes to quantify and analyze the spectrum of HNCA and should help as a starting point for a much needed population based study in this region. A comprehensive effort is needed to identify the cause of such high prevalence, generate awareness and treatment options suited to meet this challenge.

**REFERENCES**

1. Das T, Taneja GM, Chaddah MR. Nasopharyngeal carcinoma. *Ann Otol Rhinol Laryngol* 1954;63:890.
2. Paymaster JC. Some observations on oral and pharyngeal carcinomas in the state of Bombay. *Cancer* 1962;15:578.
3. Shaw HJ. Glottic cancer of larynx. *J Laryngol Otol* 1965;79:1.
4. Singh NP, Sachan MS, Budhiaraj N. Anaesthetic problems in excisional surgery. For malignant lesions of oral cavity and maxillary antrum. *Indian J Cancer* 1965;2:135.
5. Acheson ED, Hadfield EH, Macbeth RC. Carinoma in nasal cavity and accessory. Sinuses in wood workers. *Lancet* 1967;1:311.
6. Srivastava SP, Sharma SC. Gingival cancer. *Indian J Cancer* 1968;5:89.
7. Jussawalla DJ, Deshpande VA. Evaluation of cancer risk of tobacco chewers and Smokers, an epidemiological assessment. *Cancer* 1971;28:244.
8. Iwamoto H. An epidemiological study of laryngeal cancer in Japan (1960-69). *Laryngoscope* 1975;85:1162.
9. Engzell U, Englund A, Westerholm P. Nasal cancer associated with occupational Exposure to organic dust. *Acta Otolaryngologica* 1978;86:437.
10. Gangadharan P. Epidemiologic observation on cancer in Indian people. *Indian J Cancer* 1979;16:1-17.
11. Bhatia PL, Jha BK. Pattern of head and neck cancers in Manipur. *Indian J Cancer* 1982;19:241-8.
12. Padmanabhan TK, Vasudevan DM. A statistical analysis of cancer registered at the Regional Cancer Centre, Trivandrum. *Indian Journal of Cancer* 1982;19:189-96.
13. Sawai MM, Tawalkar GV, Gangadharan P. Cancer nasopharynx - A review of 1036 Cases seen at Tata Memorial Hospital, Bombay. *Indian J Cancer* 1983;20:89.
14. Jussawalla DJ, Sathe PV, Yeole BB, Natekar MV. Cancer incidence in

- Aurangabad city 1978-80. *Indian J Cancer* 1984;21:55-62.
15. Chaturvedi VN, Raizada RM, Jain SK, Tyagi NK. Cancer of ear, nose, pharynx, Larynx and esophagus in a rural hospital. *J Vivekananda Inst Med Sci* 1987;10:63-7.
16. Bhatt SC. The encyclopaedic district gazettes of Indian West Zone, 1 st edn. Gyan Publishers: New Delhi; 1991.
17. Chakravarty S, Kar TK, Ghosh LM. Neoplasm of ear, nose, throat. *Indian J Otolaryngol Head Neck Surg* 1992;1:113-8.
18. Kulkarni PV, Jaiswal SS, Rathod SB, Khalique A, Kulkarni RR. Profile of Malignancy at Ambajgai (15 years retrospective study). *Indian J Cancer* 1996;33:31-6.
19. Manjari M, Popli R, Paul S, Gupta VP, Kaholon SK. Prevalence of oral cavity, Pharynx, larynx, nasal cavity malignancies in Amritsar, Punjab. *Indian J Otolaryngol Head Neck Surg* 1996;48:189-96.
20. Thakur S, Chaturvedi V, Singh AK, Puttewar MP, Raizada RM. Pattern of ear, Nose, pharynx, larynx and esophagus (ENFLO) cancers in rural based hospital. *Indian J Otolaryngol Head Neck Surg* 2001;53:93-9.
21. A. Bhattacharjee, A. Chakraborty, P. Purkaystha. Prevalence of head and neck cancer in North East. *Indian J Otolaryngol Head Neck Surg* 2006;58:15-19.
22. Ajay et al. Oral cancer prevalence. *J of Oral research and review* 2018;10:11-14.