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Head and neck carcinoma and its association with environmental factors

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ABSTRACT

Background: Cancer of head and neck are the 6th most common cancer worldwide, with an increasing frequency in developing countries. In India head and neck cancers account for 30-40% cancer at all sites. Head and neck cancers are one of the major causes of morbidity and mortality in older age groups. The lack of awareness, unavailability of proper screening facilities in rural population and use of carcinogenic addiction are the cause for high prevalence of cancer of head and neck in developing countries.
Methods: This cross-sectional study on head and neck carcinoma and its association with environmental factors was carried out in the Department of Otorhinolaryngology and Head- Neck surgery, N. S. C. B. MCH, Jabalpur from January 2016 to January 2017.
Results: The prevalence is found to be significantly high in carcinoma oral cavity which is 45.5% followed by carcinoma larynx (30%). These are affecting male more than female with ratio of 6:1, in the age group of 4th to 6th decade, living in low socioeconomic strata. Majority are associated with tobacco chewing (33.3%) followed by smoking (25.5%).
Conclusions: It is concluded that patients usually present to a tertiary care centre at advanced stages. This can be attributed to lack of awareness and unavailability of proper medical facilities in rural population. There should be awareness about disease, health education in community about carcinogenic substances like tobacco, smoking, alcohol etc., proper medical facilities in low socioeconomic strata to reduce the burden of carcinomas.

Keywords: Head and neck carcinoma, Environmental factor, Prevalence, Socioeconomic condition, Association, Stage of cancer

INTRODUCTION

Cancer of head and neck are the sixth most common cancer worldwide with an increasing frequency in developing world.[1] In India, head and neck cancers accounts for 30-40% cancers of all sites. Head and neck cancers are one of the major causes of morbidity and mortality in older age group.[2] Squamous cell carcinoma predominates among cancers of upper aero digestive tract.

Tumor which is aptly defined by Willis (1967) as "an abnormal mass of tissue, the growth of which exceeds and is uncoordinated with that of normal tissue and persists in the same excessive manner after cessation of the stimuli which evoked the change" is largely accepted.[3]

In this study, we have explained head and neck carcinoma and its association with environmental factor. The lack of awareness, unavailability of proper screening facilities in rural population and use of carcinogenic

addiction like smoking, tobacco chewing are the cause for high prevalence of cancer of head and neck in developing countries.

METHODS

Type of study

This study was a cross sectional study.

Selection criteria

All the patients presenting with proven head and neck carcinoma (oral cavity, oropharynx, nasopharynx, larynx, and maxilla) with or without addiction were constituted in this study.

Method of collection of data, study place, period and procedure

This study was carried out on 90 patients of all age groups with proven head and neck carcinoma came to Department of Otorhinolaryngology and Head- Neck surgery, N.S.C.B. Medical College and Hospital, Jabalpur for a period of 1 year (from January 2016 to January 2017).

The standard procedure of examination - a detailed clinical history, physical examination both local and general, biopsy and histopathological examination of primary site, and radiological examination was done.

Prior informed consent was signed by all the participants enrolled as per guidelines and standards of research using human beings.

Ethical approval

The study was given approval by the institutional ethics committee (IEC), Jabalpur.

Statistical analysis

The variables used for comparison were treated using two sample test of probability and statistical significance was attributed when $p<0.05$.

RESULTS

Our study was conducted on 90 cases of head and neck carcinoma. The mean age of presentation of head and neck carcinoma, for males was 52.57 (±13.35) years and for females 44.5 (±13.80) years. Thus age of presentation for females was around one decade earlier than their male counterparts. Thus it is evident that head and neck cancer is more common in males but occurs earlier in females. The male to female ratio in studied cases was 6: 1 with a significant male preponderance. 78 (86.67%) were males and 12 (13.33%) were females.

Patients from rural locality reported more than urban locality which was 75.5% and most were labourers (44.4%).

In the patients with head and neck carcinomas, most common site observed was carcinoma oral cavity (41%) followed by carcinoma larynx (30%) and carcinoma oropharynx (23.3%). But if specific site wise observed, then most common diagnosis carcinoma larynx (30%) followed by carcinoma buccal mucosa and carcinoma BOT equally distributed i.e., 20%, followed by carcinoma tongue (16.67%) followed by carcinoma maxilla (4.4%) then carcinoma tonsil and carcinoma lip equally distributed i.e., 3.3% and carcinoma FOM and carcinoma nasopharynx equally distributed 1.1% (Table 1).

Table 1: Prevalence of site of head and neck carcinoma.

	No. of cases	%
Ca larynx	27	30
Ca oropharynx	21	23.3
Ca oral cavity	37	41
Ca maxilla	4	4.4
Ca nasopharynx	1	1.1
Total	90	100

8.9% cases of head and neck carcinoma had distant metastases at the time of presentation (Figure 1).

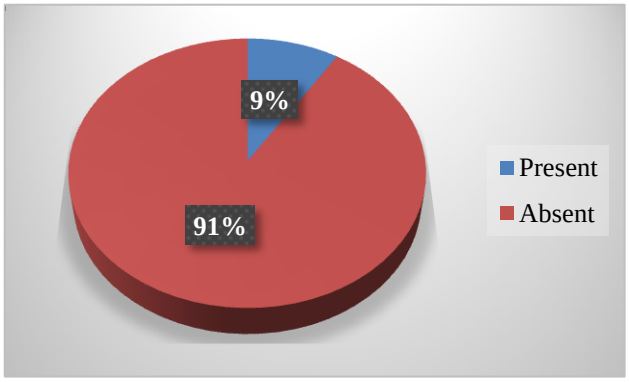

Figure 1: Distribution of distant metastases in studied population.

Out of 90 cases of head and neck carcinoma, 93.3% of the cases were Hindus, 4.4% cases were Muslims and 2.2% cases were Christians. 75.5% of population were living in rural area. 44.4% cases were labourers (i.e., low socioeconomic status). 78.9% cases were non-vegetarian. Thus it shows that head and neck cancers are more common in Hindus, residing in rural area, of low socio-economic status. Non-vegetarians are more prone to develop head and neck cancer (Table 2).

In our study 48.9% cases presented with oral ulcer, 42.2% cases withy dysphagia, 28.9% cases with

hoarseness, 16.7% cases with dyspnoea, 12.2% cases with reduced mouth opening and 7.8% cases with cough. Thus it is seen that in head and neck carcinoma, oral ulceration was the most common presenting complaint followed by dysphagia and hoarseness (Figure 2).

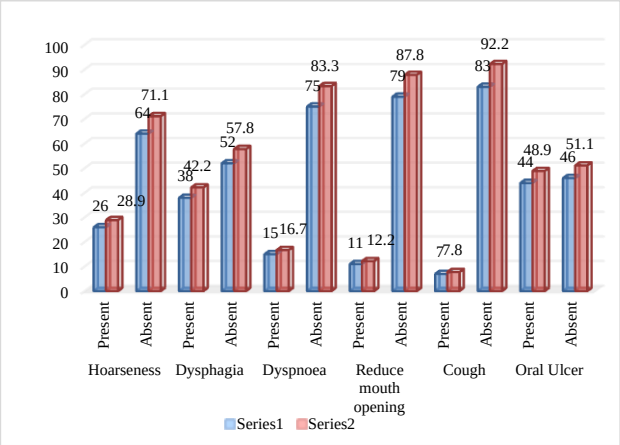

Figure 2: Presenting complaints.

Table 2: Study of socioeconomic aspects of the studied population.

Characteristics	Factor	No. of cases (n=90)	%
Religion	Hindu	84	93.3
	Muslim	4	4.4
	Christian	2	2.2
Locality	Urban	22	24.5
	Rural	68	75.5
Occupation	Labourer	40	44.4
	Self employed	29	32.2
	Private job	4	4.4
	Government job	1	1.1
	Student	1	1.1
	Nil	15	16.7
Diet	Veg	19	21.1
	Non veg	71	78.9

Most common site of ulcer presentation in oral cavity was buccal mucosa 22 (24.4%) cases followed by tongue 15 (16.7%) cases then other sites of oral cavity.

Most common type of addiction was tobacco chewing alone (33.3%) followed by tobacco chewing + smoking both (28.9%) followed by smoking alone (25.5%). 4.4% cases had addiction of tobacco chewing and alcohol both and 3.3% cases smoking and alcohol both. 4.4% cases were non-addicts (Table 3).

Mean duration of addiction was 25.0 (±11.13) years. This finding strongly suggests that addiction for a longer duration is a primary cause for carcinoma.

Table 3: Distribution of various types of addiction in studied population (n=90).

Addiction	No of cases	%
Tobacco	30	33.3
Smoking	23	25.5
Tobacco+smoking	26	28.9
Tobacco+alcohol	4	4.4
Smoking+alcohol	3	3.3
No addiction	4	4.4

Smoking is most commonly associated with carcinoma larynx (84.6%) than carcinoma oral cavity (15.4%) and tobacco chewing most commonly associated with carcinoma oral cavity (90.9%) than carcinoma larynx (9.1%).

If patient is addicted to tobacco chewing and smoking both then it almost equally distributed to carcinoma larynx and carcinoma oral cavity (Table 4).

In majority of cases of head and neck carcinoma, histopathological grading of primary head and neck carcinoma is Grade II-81% followed by Grade I-13%, then Grade III-6%.

Majority of the cases presented at stage IVa - 54.4% followed by III- 33.2%. But Ca larynx most commonly present at stage III (48%), followed by stage IVa (37%). Similarly Ca maxilla most commonly present at stage III (75%) followed by stage Iva (25%) (p=0.00028) (Table 5).

In histopathological report of head and neck carcinoma, squamous cell carcinoma (SCC) was commonest type comprising 94.5% cases.

Table 4: Association with addiction.

Site of diagnosis	Addiction					
	Smoking (%)	Tobacco (%)	Tobacco + smoking (%)	Tobacco + alcohol (%)	Smoking + alcohol (%)	Total (%)
Ca larynx	11 (84.6)	2 (9.1)	10 (45.5)	1 (25)	3 (100)	27
Ca oral cavity	2 (15.4)	20 (90.9)	12 (54.5)	3 (75)	0	37
Total	13	22	22	4	3	64

Table 5: Correlation between diagnosis and stage at presentation.

Stage	Ca larynx (%)	Ca oral cavity (%)	Ca oropharynx (%)	Ca nasopharynx (%)	Ca maxilla (%)	Total (%)
I	0	0	0	0	0	0
II	0	0	0	0	0	0
III	13 (48.15)	8 (21.6)	4 (19)	1 (100)	3 (75)	29 (32.2)
IVa	10 (37.04)	27 (73)	11 (52.4)	0	1 (25)	49 (54.4)
IVb	1 (3.7)	1 (2.7)	2 (9.5)	0	0	4 (4.4)
IVc	3 (11.11)	1 (2.7)	4 (19)	0	0	8 (8.8)
Total	27	37	21	1	4	90

DISCUSSION

In our study, head and neck cancers were observed to be more common in males (86.67%) with a male to female ratio of 6:1. According to the age groups head and neck cancers were more common in 5th to 6th decade. It was also observed that the presentation of cancer in males, majority was seen in 5th to 6th decade but in females, majority seen in 4th to 5th decade.

Issing et al, Kim et al and Ologe et al found almost similar i.e., higher incidence in age group of 5th to 6th decade and male to female ratio around 4:1.[4-6]

Majority of cases were from rural areas (75.5%) and most were labourers (44.4%). This was comparable with the study of Heeranandani.[7] The higher incidence in lower income group seems to be due to larger population of the group in the catchment area, malnutrition leading to lowered resistance, lack of health education, ignorance regarding the lump in neck which is not considered seriously. Poor diagnostic facilities in rural area also play some role in the higher incidence in this group.

In our study most common diagnosis (in head and neck carcinoma) observed was carcinoma oral cavity (41%) followed by carcinoma larynx (30%) and carcinoma oropharynx (23.3%). This study compared with study of Remmert et al which shows the same i.e., most common was carcinoma oral cavity (52%) followed by carcinoma larynx (26%).[8]

In this study of head and neck carcinoma most common presenting complaints was oral ulcer (48.9%) followed by dysphagia (42.2%) followed by hoarseness (28.9%), dyspnoea (16.7%), reduced mouth opening (12.2%) and cough (7.8%). This can be explained by the fact that carcinoma oral cavity was the most common diagnosed cancer followed by carcinoma larynx in the study.

Most common type of addiction was tobacco chewing alone (33.3%) followed by tobacco chewing + smoking both (28.9%) followed by smoking alone (25.5%). 4.4% cases were non-addicts. This may be the possible reason for carcinoma oral cavity to be the most common diagnosis followed by carcinoma larynx.

Nearly four fifth of the addiction i.e. 85.9% had duration of addiction >10 years with a mean duration of 25.0 (±11.13) years. This finding strongly recommends that higher duration of carcinogenic addiction is a primary cause of carcinoma.

Smoking is most commonly associated with carcinoma larynx (84.6%) than carcinoma oral cavity (15.4%) and tobacco chewing most commonly associated with carcinoma oral cavity (90.9%) than carcinoma larynx (9.1%). If patient is addicted to tobacco chewing and smoking both then it almost equally distributed to carcinoma larynx and carcinoma oral cavity. Putney, Banjanim et al, Kim et al, found similar incidence of smokers in carcinoma larynx, thus correlating with our study.[5]

In most cases of head and neck carcinoma, histopathological grading of primary head and neck carcinoma is Grade II- 81% followed by Grade I- 13%, then Grade III- 6%. These incidence correlated with study of Metka et al.[9]

Majority of the cases of head and neck carcinoma presented at stage Iva- 54.4% followed by III- 33.2%. But Ca larynx most commonly presented in stage III (48%), followed by stage IVa (37%). (p=0.00028) which shows significant relationship). Vernham et al also found similar incidence of presentation i.e., 61% of patients were presenting with advanced disease (stage III and IV).[10]

In present study it was noted that out of 90 cases of head and neck carcinoma, 8 (8.9%) cases had distant metastases to lung, liver, kidney etc., at the time of presentation and this is observed mostly in those patients who presented with longer duration (more than 5 months) of complaints. This correlated with study of Black, et al in which they observed out of 121 patients with advanced head and neck carcinoma 15 (12.4%) patients had distant metastasis.

CONCLUSION

It is concluded that patients usually present to a tertiary care centre at advanced stages. This can be attributed to lack of awareness and unavailability of proper medical

facilities in rural population. There should be awareness about disease, health education in community about associated carcinogenic substances like tobacco, smoking, alcohol etc., proper medical facilities in low socioeconomic strata to reduce the burden of carcinomas. As the cause can be explained by the fact that the lack awareness in population and unavailability of medical facility could be the reason for late presentation at hospital. The environmental factors and increased addiction habits were also contributing factors.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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