



Original Article

Multifactorial Risk Factors for Tomours of Upper-Aerodigestive Tract

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Abstract

Background: Many etiological factors contribute to the development of UADT malignancy, Such as the use of all forms of tobacco, alcohol consumption, viruses (HPV), nutritional factors, poor oral hygiene, chronic inflammation, syphilis, sepsis, sunlight (in cases of lip cancer), miscellaneous factors including heat (particularly heat from a pipe stem in cases of lip cancer), and repeated traumatic irritation.

Aims and Objective: To study risk factors associated with tumours of upper aero-digestive tract.

Material and Methods: Here we study various risk factors for 156 cases of UADT at a tertiary care hospital.

Results and Conclusion: People with poor socioeconomic background, mixed diet and poor oral hygiene are more vulnerable to UADT tumours. Smoking was associated with laryngeal malignancy and tobacco chewing was associated with malignancy of oral cavity with P value being <0.005 (significant).

Keywords: Upper areodigestive tract, tumours, cancer.

Introduction

Tumours of upper aero tract are a great challenge to the modern medical science and to the patient as it often calls for a major surgery which often leads to disfiguration also. Many of the tumours recur frequently and some of them fail to respond to the usual treatment. Many etiological factors contribute to the development of UADT malignancy, Such as the use of all forms of tobacco, alcohol consumption, viruses (HPV), nutritional factors, poor oral hygiene, chronic inflammation, syphilis, sepsis, sunlight (in cases of lip cancer), miscellaneous factors including

heat (particularly heat from a pipe stem in cases of lip cancer), and repeated traumatic irritation. Tobacco and alcohol consumption jointly account for about 80% of cases of UADT cancer. But only a small proportion of exposed develop neoplastic lesions. This suggests that other factors, in combination may be responsible.

The mechanism for alcohol drinking as a risk factor of UADT cancer is unclear. Tobacco and alcohol act synergistically such that the alcohol's carcinogenic action involves enhancement of the well-known carcinogenic effect of tobacco.

Material and Methods

This study comprises of 156 cases of histopathological diagnose tumors of upper aero digestive tract who attended a tertiary care hospital in surat, in the year August 2010 to October 2012. All patients with suspected tumors of upper aero digestive tract were included and all non-neoplastic cases and retrospective cases were excluded. Clinical history was taken from all the cases with more stress on probable risk factors of tumors. Patients were questioned about habits of smoking, Alcohol consumption and tobacco chewing (Gutkha, Mava and others). Patients were also questioned about their socioeconomic status, dietary habits and were examined for oral hygiene.

Observations and Results

In the present study, the cases of tumors of upper Aero Digestive Tract were studied.

Most common age of presentation was between 41 to 60 years of age. Male to Female ratio of all cases is 3.6:1. 104 (66.67%) cases of UADT had mixed diet; whereas 52 (33.33%) cases had vegetarian diet. 120(77.00%) patients had poor oral hygiene and 36(23.00%) cases had good oral hygiene. 142 (91.00%) cases had poor socioeconomic status and 14(9.00%) cases were of middle class.

Table showing distribution of malignant and Carcinoma in-situ cases of UADT according to Habit

Categories	No. of cases
Smoking only	26(19.10)
Chewing only	17(12.50)
Drinking only	0(0.00)
Smoking + chewing	33(24.10)
Smoking + drinking	23(16.70)
Drinking + chewing	5(3.60)
All habits	11(8.00)
No habit	22(16.00)
Total	137

Maximum 33(24.10%) cases were smokers as well as tobacco chewers. 23(16.70%) cases were smokers as well as consumed alcohol. 11(8.00%) cases had all three bad habit.

Out of 137 malignant and carcinoma in situ cases, 115(84.00%) were either only smokers, only chewers or any combined habit and 22(16.00%) cases were free from any bad habit.

Frequency	Smokers
1-5 times/day	18(13.00)
6-20 times	48(35.00)
>20 times	27(20.00)
Non smoker	44(32.00)
Total	137

Out of 137 cases, 48(35.00%) cases smoked biddies 6-20 times per day. 27(20.00%) cases smoked biddies >20 times per day, 18 cases (13.00%) smoked biddies 1-5 times/day. 44 cases (32.00%) were non-smokers. Out of these 44 cases, 22 cases did not have any habit and 22 had habits other than smoking.

53 (39.30 %) cases chewed tobacco 1-5 times /day. 11(8.00%) cases 6-10 timed /day. 2 (0.70%) cases chewed >10 times /day. 71(52.00%) cases were non tobacco chewers. Out of these 71 cases, 49 cases had habit other than tobacco chewing. 22 cases had no any habit.

Out of all cases of UADT (156 CASES), 19(12.00%) cases were benign, 129(83.00%) cases were malignant and 8(5.00%) cases were Ca in-situ.

Out of total 129 malignant cases, 124 (96.00%) cases were of carcinomas, 1(0.80%) case was of sarcoma, 2 (1.60%) cases of melanoma, 2 (1.60%) cases were of lymphomas. Most common site of carcinoma of UADT was oral cavity (tongue) followed by hypo pharynx (pyriform fossa) and larynx (supraglottis). Sarcoma and lymphomas were seen in Nasal Cavity.

Table showing site wise distribution of Carcinomas of UADT

Cate- gories	Sites															T	%
	L	T	FO M	C	G	P	N C	N F	PN S	PF	PC	PP W	SG	GL	SB		
SCC	0	26	1	6	0	4	0	0	1	30	2	6	20	11	0	107	86%
VCA	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	3	2.50%
BSCC	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1.60%
SPCC	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.80%
VSCC	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0.80%
PDCA	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	3	2.50%
NPC	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	2.50%
MEC	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.80%
PLGA	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.80%
ACC	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.80%
Small cell Ca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.80%
TOTAL	0	29	1	8	1	6	1	3	1	32	2	6	22	11	1	124	100%

Abbreviations

SCC: Squamous cell carcinoma
 VCA: Verrucous carcinoma
 BSCC: Basaloid squamous cell carcinoma
 SPCC: Spindle cell carcinoma
 ACC: Adenoid cystic carcinoma
 PLGA: Polymorphous low grade adenocarcinoma
 PDCA: Poorly differentiated carcinoma
 NPC: Nasopharyngeal carcinoma
 MEC: Mucoepidermoid carcinoma
 VSCC: Verrucoid squamous cell carcinoma
 Small cell Ca: Small cell carcinoma

Out total 124 cases of carcinomas, most common carcinoma was **Squamous cell carcinoma** followed by verrucous carcinoma, poorly differentiated carcinoma and nasopharyngeal carcinoma. Most common site of SCC was hypo pharynx (pyriform Fossa), followed by oral cavity (tongue) and larynx (supra glottis).3 cases were of

minor salivary gland, out of which 2 cases were in oral cavity (palate and base of Tongue) and one was in nasal cavity.

Out of total 156 cases of UADT, 19 cases were benign. Most common site was nasal cavity (7 cases) and commonly seen varieties were Angiofibroma and Capillary Hemangioma.

Table showing site wise distribution of malignant and Carcinoma in-situ cases of UADT according to habit

CAT	SITES															T	%
	L	T	FOM	C	G	P	NC	NF	PNS	PF	PC	PPW	SG	GL	SB		
SMOKING	0	0	0	0	0	0	0	1	0	13	0	0	9	3	0	26	19%
TC	0	9	0	2	1	3	0	0	1	1	0	0	0	0	0	17	12.50%
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
S + TC	0	12	1	3	0	2	0	0	0	7	1	1	3	3	0	33	24.10%
S + D	0	0	0	0	0	0	0	0	0	4	0	2	11	6	0	23	16.70%
TC + D	0	2	0	1	0	0	0	0	0	2	0	0	0	0	0	5	3.60%
ALL HABITS	0	6	0	0	0	0	0	0	0	2	1	1	1	0	0	11	8.00%
NO HABIT	0	2	0	2	0	1	4	4	0	5	0	2	1	0	1	22	16.00%
Total	0	31	1	8	1	6	4	5	1	34	2	6	25	12	1	137	100.00%

Abbreviations:

CAT: Categories
 TC: Tobacco chewing
 D: Drinking
 S: Smoking

Out of total 137 cases of Malignant and Carcinoma in situ, 26 cases (19%) were associated with only smoking. Out of these 26 cases, 13

cases (10 SCC, 2 poorly differentiated carcinoma & 1 Carcinoma in situ) are seen in pyriform fossa, 9 in supra glottis (6 SCC, 1 BSCC & 2 Carcinoma

in situ), 3 cases in glottis (SCC) and 1 in nasopharynx (NHL).

Larynx and hypo pharyngeal tumours were more commonly associated with smokers as compared to other UADT sites with Squamous Cell Carcinoma as the most common type.

17 (12.50%) cases were only tobacco chewers. Out of this, 15 cases were seen in oral cavity as 9 cases in tongue (SCC), 2 in cheek (SCC) 1 in gingiva (Verrucoid SCC) and 3 in palate (SCC). 1 case each was seen in pyriform fossa and para nasal sinus (SCC).

Most common site associated with tobacco chewing was oral cavity with maximum number of cases in Tongue. All cases were SCC and variants.

In the present study, there was no case with only alcohol consumption associated with tumours.

33 cases (24.10%) were Smokers as well as tobacco chewers. Out of these, 18 cases were seen in oral cavity as 12 in tongue (9 SCC, 1 Poorly differentiated carcinoma, 1 Polymorphous low grade carcinoma and 1 Ca in situ), 1 in floor of mouth (SCC), 3 in cheek (2 SCC, 1 Verrucous carcinoma), 2 in palate (1 SCC, 1 Spindle cell carcinoma) followed by 15 cases in larynx and hypo pharynx as 7 in pyriform fossa (all SCC), 1 in post cricoid region (SCC), 1 in posterior pharyngeal wall (SCC), 3 in supra glottis(SCC), and 3 in glottis (SCC)

23 cases (16.70%) were smokers as well as consumed alcohol. Most common site affected was larynx and hypo pharynx as 11 cases in supraglottis (10 SCC and 1 BSCC), 6 in Glottis (5 SCC, 1 in situ), 4 cases in post cricoid region (SCC) and 2 cases in posterior pharyngeal wall.

5 cases(3.60%) chewed tobacco and also consumed alcohol. 3 cases in oral cavity as 2 in tongue (1 SCC, 1 Verrucous ca) and 1 in cheek (SCC). 2 cases were seen pyriform fossa (SCC).

11 cases (8.00%) smoked biddies, chewed tobacco and consumed alcohol. 6 cases were in tongue (SCC), 2 in pyriform fossa (SCC), 1 in post cricoid region (SCC), 1 in supraglottis (SCC) and 1 in posterior pharyngeal wall (SCC).

22 cases (16.00%) had no habit. Out of these 22 cases, 5 cases (4 SCC and 1 Ca in situ) were in pyriform fossa, 4 were seen in nasopharynx (3 Nasopharyngeal carcinoma & 1 Lymphoma), 4 in nasal cavity (1 Adenoid cystic Carcinoma, 2 Malignant Melanoma, 1 Rhabdomyosarcoma), 2 in tongue (1 SCC, 1 Ca in situ), 2 in cheek (1 Verrucous carcinoma, 1 SCC), 2 in posterior pharyngeal wall (SCC), 1 in supraglottis (Ca in situ), 1 in palate (Mucoepidermoid carcinoma) and 1 in subglottis (small cell carcinoma).

By using open Epi software chi square test, P value (2 tail) is <0.005(significant). So, there is association between smoking and malignancy of UADT, tobacco chewing and malignancy of UADT, smoking and malignancy of larynx, tobacco chewing and malignancy of oral cavity while no association was found between smoking and malignancy of oral cavity.

Discussion

Tumors of upper aero digestive tract are common in India. This is due to increasing trends of smoking, tobacco chewing and alcohol consumption.

Present study includes cases from August 2010 to October 2012 (Prospective study). A variety of tumours of upper aero digestive tract were analysed for the purpose of studying the etio-pathology including smoking, tobacco chewing in the form of gutkha, mava and alcohol consumption as well histological types. Tumours of UADT accounted for 39% of all tumors caused by smoking. Alcohol and tobacco, alone or in combination, are associated with an increased risk of various cancers, including those of the upper aero digestive tract and liver. Both alcohol and tobacco use can increase the risk of cancer of the oral cavity and throat (pharynx), and their combined use has a multiplicative effect on risk. Moreover, those regions of the mouth and pharynx that are more directly exposed to alcohol or tobacco are more likely to be affected by cancer than other regions. A similar effect was found with respect to cancer of the voice box (larynx).

The risk of both oral and pharyngeal cancer rises steeply with the level of alcohol consumption. The risk of oral and pharyngeal cancer also is strongly related to smoking. Both alcohol consumption and smoking are major risk factors for laryngeal cancer (IARC 2004; Altieri et al. 2005).^[14, 15, 2 16]

In present study, 53% patients were in the age group of 41 to 60 years. Youngest patient was 6 years old and oldest was 95 years old. Mean age was 50.20 years which is in concurrence with other studies.^[1, 2]

In oral tumours maximum number of cases were seen in 41-50 (30.90%) followed by 31-40(21.80%) in present study which is similar to other studies^[3, 4, 23] Most of the studies found incidence of tumours of UADT including oral tumours in people around 50 years of age. Therefore, clinical screening programmes targeted at this age would help in the early diagnosis of tumours and would increase the treatment outcome. M:F ratio was (3.6:1). The finding correlates with other studies.^[1, 4] In oral cancers, ratio was 2.7:1 showing males as more vulnerable than females.^[5, 6] 91% patients were from low socioeconomic status and 9% patients were from middle class.^[7,8] The lower socioeconomic status may be a risk factor for poor oral hygiene. 66.67% patients had mixed diet and 33.33% patients had vegetarian diet. The present study shows greater incidence of malignancy in cases consuming mixed diet.^[9, 10] 77% patients had poor oral hygiene and 23% patients had good oral hygiene indicating poor oral hygiene as a risk factor for SCC similar to other study.^[11]

Most common site of tumours of UADT was oral cavity (tongue) followed by hypo pharynx (pyriform fossa) and larynx (supraglottis). Sarcoma and lymphomas were seen in Nasal Cavity.

The higher incidence of oral tumours in the present study may be due to greater consumption of tobacco in the form gutkha, mava or other forms as compared to tobacco smoking.

Etiology

Total 124 cases were of carcinomas; most common carcinoma was Squamous Cell Carcinoma. Most common site of SCC was hypo pharynx (pyriform fossa) closely followed by oral cavity (tongue).

In present study, Out of 137 cases (including malignant and carcinoma in situ cases), 115 (84.00%) were either only smokers, only chewers or any combined habit and 22(16.00%) cases were free from any habit.

Larynx and hypo pharyngeal tumours were more commonly associated with smokers as well as those who smoke and drink as compared to other UADT sites with Squamous Cell Carcinoma as the most common type.

Most common site associated with tobacco chewing was oral cavity with maximum number of cases in tongue. All cases were SCC and its variants. p value for association between malignancies of oral cavity and tobacco chewing was found to be <0.005 (significant). So, it can be concluded that tobacco chewing is the major risk factor for malignancies of oral cavity.

Conclusion

Tumours of UADT are predominantly a disease of males. It may affect older and younger age group. People with poor socioeconomic background, mixed diet and poor oral hygiene are more vulnerable to UADT tumours. Smoking was associated with laryngeal malignancy and tobacco chewing was associated with malignancy of oral cavity with P value being <0.005 (significant). Oral cavity tumours were the most common followed by hypopharyngeal tumours. Tongue was the most common site in tumours of oral cavity. Squamous cell carcinoma as the commonest histological variety.

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