RESEARCH ARTICLE

Risk Factors and Costs of Oral Cancer in a Tertiary Care Hospital in Delhi

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Abstract

The present study conducted with 100 oral cancer patients at a private tertiary care hospital in Delhidemonstrated that stage III cancer was associated with longer use of tobacco and poor oral hygiene. There was also statistically significant association (p<.05) between consumption of tobacco and alcohol. More than 60% treatment expenditure was on surgery followed by accommodation (9%) and investigations (8%). The effect of tobacco was well known among patients as 76% of the patients knew that common cancer in tobacco chewer is 'oral cancer', 22% of the patients however responded that they did not know which cancer is common in tobacco chewers. 58% said that they learnt about ill effects of tobacco from media while 24% said they learnt from family and friends. Out of 78 tobacco users, 60 (77%) said that they never received help to quit tobacco while 18(23%) have received help to quit.

Keywords: Oral cancer - carcinoma - tobacco - oral hygiene - stages of cancer - comorbid conditions - treatment cost

Introduction

In South-East Asia region, cancer accounts for a significant portion of morbidity and mortality. Cancer contributes to 3.4 % of all deaths reported from India, 6.6% from Indonesia, 2.9% from Myanmar, 0.8% from Nepal, 4.2% from Sri-Lanka and 5.5% from Thailand(WHO, 2008). Cancer associated with the use of tobacco constitutes nearly 44.6% of cancers in men, and 20% of cancers in women. Over 80% of cases come for treatment at a very late stage when survival rates are low (Warren et al., 2006). Hospital data clearly indicate that the two organ sites: *i*) the uterine cervix in women and: *ii*) the oropharynx in both sexes represent approximately 50% of all cancer cases. The cure rate of these neoplasm is also very high if they are treated surgically at stages 1 and 2. But unfortunately in most cases the cancer patients present themselves to a medical facility when the disease is far advanced and is not amenable to treatment. It is estimated that 91% of oral cancers are directly related to the use of tobacco (WHO, 2008). Its high frequency in Central and South East Asian countries e.g. India, Bangladesh, Sri-Lanka, Thailand, Indonesia and Pakistan has been well documented. Each year, about 5,75,000 new cases and 3,35,000 deaths occur worldwide (IARC, 2004).

In India, it is estimated that there are approximately 2 to 2.5 million cases of cancer at any given point of time, with around 7 to 9 lakhs new cases being detected each year. Nearly half of these cases die each year (Government of India, 2009-2010). India reports the highest number of oral cancers worldwide with up to 80,000 new cases

annually (ICMR-NCRP, 2011). Oral cancer is associated with significant morbidity, and low survival. Tobacco, which is widely used in India, is a major cause of cancer of the upper digestive and respiratory tract. With estimated incidence of 12.48 cases per one lakh population for males and 5.52 per one lakh population for females, oral cancer is a major health problem in India. The estimated mortality is about 3.48 per lakh in males and 1.34 per lakh in females (Dinshaw et al., 2004). A large epidemiological survey indicated that oral cancer and pre-cancerous lesions occurred almost solely among those who smoked or chewed tobacco and oral cancer was almost always preceded by some type of pre- cancerous lesion. Oral cancer can also be caused by high concentrations of alcohol and that alcohol appears to have a synergistic effect in tobacco users (Bala et al., 2006).

The most common forms of tobacco smoking in India are bidi, cigar, chillum, hookah. The tobacco chewing is betel quid which usually consists of betel leaf, arecanut, lime and tobacco. It is common for poorer people to rub with thumb flakes of sun dried tobacco and slaked lime in the palm of their left hand until the desired mixture is obtained. The mixture (Khaini) is then put in mouth in small amounts and at frequent intervals during the day and slowly sucked and swallowed after dilution with saliva. Sometimes, tobacco in powdered form is inhaled as snuff. The another type of cancer common in the eastern coastal regions of Andhra-Pradesh state in India is the epidermoid carcinoma of the hard palate. It is associated with the habit of reverse smoking of cigar, i.e. smoking with the burning end inside the mouth (Government of India, 2006).

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The large number of government and private hospitals in India provide cancer treatment but facilities are not adequate. India has a population of approximately 1200 million with a requirement of 1200 radiotherapy machines (RT), whereas presently about 400 RT machines are available for cancer treatment. The modern radiotherapy facilities are concentrated in private hospitals where the cost of RT course appear to be prohibitively high and beyond reach of common Indians (NIHFW, 2011). Public hospitals provide the tertiary care at low costs. However, even in such "low cost" hospitals, patients have to bear several direct and indirect costs. Cancer is one such disease, where the out-of–pocket costs incurred because of the illness can consume substantial part of income and family budget (Nair et al., 2013).

Inspite of introduction of new diagnostic, pharmacological and treatment technologies of the last decade, which contribute towards such high costs, the survival rate remains unchanged (Meropol et al., 2009). A study in Greece attempted to quantify the direct cost of Oral Cancer treatment direct costs to the healthcare system in 2002 for treating group of 95 oral cancer patients. The average cost of treatment per patient was estimated at US$ 7,450. Compared to similar treatments cost elsewhere in Europe or the United States, the clinical management of oral cancer in Greece, in absolute terms, seems low. However, in Greece, treating oral cancer requires 65% of a person's annual salary (8-month salaries) (Athanasios Zavras et al., 2002). In the Netherlands, Van Agthoven et al. (2001) reported an average cost of US$ 22,080 (25,096 Euros) on the basis of 306 patients with a primary Oral Cancer tumour. In the United States, Funk et al reported an average cost of US$ 32,500 after evaluating 73 patients with a primary oral cavity tumour. The stratified analysis of costs per patient by stage of disease revealed that treatment cost ranged from approximately US$ 3,662 for Stage I, to US$ 11,467 for Stage IV cancers (Funk et al 1999). Similar variation per stage of laryngeal cancer was noted among others by Morton et al. (1997) in New Zealand and, their reported costs ranged from US$ 11,000-27,000.

A study on head and neck cancer (62% of cases were from oral cavity, oropharynx) was conducted in France in which an extensive analysis of hospital medical information system database was undertaken. According to this study, the most frequent localization of cancer was the oropharynx followed by the oral cavity, the pharynx other than oropharynx, the larynx and the salivary glands. The mean annual cost of hospitalization reached €7842 per patient with head and neck cancers. The mean annual cost per patient with H and N cancers varied from €6151 to €7673 in public hospitals, whereas it varied from €2764 to €3562 in the private hospitals. The annual average cost of hospitalization was higher in men than in women, equal at €8038 and €6982 respectively. The type of treatment also influenced hospitalization costs: they were higher if the primary diagnosis was surgery or palliative care than for chemotherapy or radiotherapy (St Guily et al., 2001).

A retrospective study was done on ''cost of care for early-and late-stage oral and pharyngeal cancer'' in California identified costs from the insurer's perspective and estimated that the median cost for treating oral and pharyngeal cancer was over $25,000 for the first year following diagnosis in the California Medicaid system. Oral cancer patients treated with surgery or radiation alone cost approximately 36% less than those treated with combination therapy or palliative chemotherapy. After defining patients by the treatment received, regression analysis showed significantly lower overall direct costs for treating tumours as early stage Versus late-stage (p=0.002). When investigating monthly median costs of care, significantly higher costs were realized in the first 4 months following diagnosis for the patients receiving treatment for typical early stage tumours and the first 5 months for those patients receiving treatment for typical late-stage disease (p<0.05). Findings of this study demonstrated that the cost difference between the two treatment groups began in the third month after initial diagnosis (Joshua et al., 2008).

In China, a detailed study was conducted on exclusively 456 oral cancer patients including 176 females and 280 males to analyze the cost of treatment. The primary goal of cost analysis in the study was to identify the relationship of differences in MHD (medical hospital days) and CPP (cost per patient) with pathology, clinical stage, gender, smoking habit, medicare and census register. This study examined the detailed MHD and CPP of patients in different clinical stage and with different pathology and findings indicate that the MHD and CPP of patients in early clinical stages (I~II) were lower than those in late stages (III~IV). The CPP and MHD of adenocarcinoma group were evidently lower than that of SCC and sarcoma group. There were no significant different in MHD and CPP between SCC and sarcoma group. The study showed that the cost for diagnosing, treatment and hospitalization in early stage were significantly lower than those in late stage. The data indicated that the cost for diagnosis in each pathology group had no evident differences (p>0.05). The treatment cost in adenocarcinoma group was significantly lower than that of SCC groups. The hospitalization cost of adenocarcinoma group was significantly lower than that of SCC and sarcoma group.

Study findings demonstrate that the MHD and CPP of smokers were significantly higher than those of non-smokers (p=0.018). This study indicates that the treatment cost of the male patients was significantly higher than the female patients (p=0.015). It is noticeable that the diagnosis and treatment cost for patients with medicare was significantly lower than those without medicare. Comparing the cost of smokers with non-smokers, the smokers had significantly higher cost for treatment and hospitalization than those non-smokers (Sheng et al., 2010).

A web search on 'cancer treatment costs in India' showed only the price list of one particular corporate hospital group charging between USD 1350-2600 for Radio Therapy course of 4-8 weeks (http://www.indiaprofile.com/medical-tourism accessed on 10 May 2013). It is to be highlighted that this cost range does not take into account the costs of other cancer treatments like surgery, chemotherapy, supportive medicines and indirect

costs (transport, lodging, food etc.) borne by the patient. A comparative evaluation hospital charge in USA reveals that the radiation therapy course costs between $3496-$5629 for common cancers, through the fee-for-service Medicare (Warren, 2008). This is to be seen in the context of average monthly household income of approximately $4186 for an USA citizen, compared to the Indian household earning of Rs.11666 (http://en.wikipedia.org/wiki/Median_household_income accessed on 10 May 2013). To compare the figure expenditure in India Rupees may be converted almost half in terms of US$. There are very few studies on cost of cancer in India. A study by Nair et al involving 508 patients in six government tertiary cancer treatment hospitals in India found that average cost of investigations was Rs. 16739 (min Rs. 2007 and max Rs. 37670), average cost of treatment was Rs. 41311 (min Rs. 14366 and max Rs. 55040), average indirect cost (on transport, attendants expenditure et) was Rs.27248 (min Rs. 6478 and max Rs. 66029) and finally opportunity cost(loss of wages etc) was Rs. 18165 (min Rs. 4386 and max Rs. 43750). Expenditure were more on super-speciality hospitals as last stage and critical patients usually reach to such hospitals.

The treatment cost was highest about 40%.However, indirect cost including wage loss etc accounted for about 44% expenditure. In a study conducted at All India Institute of Medical Sciences (AIIMS), researchers provide the costs for treatment for cancer that has a large financial impact on patients. The mean monthly per capita income of sampled cancer patients was of India Rupees 1749. The mean (average) costs to a patient was Rupees 36,812 and it consisted of: IRS 14,597 spent before coming to the hospital, IRS. 14,031 at the hospital, and IRS. 8,184 during the prolonged period of radiotherapy course. It seems that few studies are available in India on cost of cancer treatment specially oral cancer, therefore present study has been conducted to find out the treatment costs of oral cancer in different stages in a private tertiary care hospital in Delhi.

Materials and Methods

The present study was conducted in a tertiary cancer care private hospital in Delhi. A total of 100 randomly selected oral cancer patients were included in the study who were between 18-65 years, histopathologically confirmed with the diagnosis, started and completed the treatment at the same hospital during April 2011 to March 2012. The data was collected when patients came for follow-up during October to December 2012. A checklist was developed to collect cost of oral cancer treatment data of patient from the hospital records of tertiary level hospital in Delhi. No identification details were collected from the records. Information on socio-demographic profile, personal history, diagnostic and treatment details, treatment costs, medical insurance etc were collected.

The study proposal was approved from ethical angle in the Academic Committee of the National institute of Health and Family Welfare, New Delhi.

Results

Socio-demographic characteristics of the oral cancer patients

Majority of the patients (72%) were from adjoining states like Uttar Pradesh , Haryana, Rajasthan etc and rest 18% were from Delhi. Majority of patients (92%) were males and 8% were females, 28% patients were from rural areas and rest 72% were urban areas. More than 50% were having qualification of high school and above. The age of the sampled patients ranged from 29 years-65 years and the mean age was 50.17 years. Majority (36%) were, doing small business 30% were either unemployed or labourer and 10% were in government job and all female patients were housewives. More than half (57%) patients were from income less than Rs 10,000 (approximately US$ 200) per month and 10 % were from weaker section of society.

Personal history and use of tobacco, alcohol

Patients main complaint at the time of registration and referral were studied. More than half (54%) were referred by the private doctors and rest 36% were by the government doctor. Further analyzing the records, it was found that 62% of the patients had come to the hospital with Ulcer as the main complain while 24% had growth as the main complain for coming to the hospital. Duration of above complains varied from 1 month to 36 months with a mean of 13.54 months.

Regarding tobacco consumption, 74% were using tobacco products. Out of theses tobacco users patients, only 5% were using tobacco for less than 10 years and rest (95%) were using tobacco for more than 10 years. As per the type of tobacco product used, 28 were gutaka chewers, 30 were bidi/cigarette smokers and another 12 used any other chewable tobacco product like khaini, Pan-masala, Beetle. Usually, oral hygiene had a bearing on the stage of tumour, therefore same was analysed. It was found that 28% had good oral hygiene, 40% had fair and rest (32%) had poor oral hygiene.

On further analysis, it was found that 38% were also taking alcohol while the rest (62%) were non-alcoholics. Data was further analysed for common use of tobacco and alcohol. Out of 74 tobacco users, 34 were alcoholics too and out of 26 non tobacco users, 4 were alcoholic. The chi-square was showed a significant association between tobacco and alcohol use (p<0.05).

Morbidity status of cancer patients

Our data revealed that 60% of the patients had no associated co-morbid conditions such as Diabetes Mellitus(DM)/Hypertension(HTN)/Coronary Artery Diseases(CAD) etc and 22% had more than one associated co-morbid condition. Diagnosis of all the patients was histopathologically (HPE) confirmed.

Our diagnosis revealed that 46% of the patients were of Ca Tongue, 42% were of Ca Buccal Mucosa. The distribution of patients as per diagnosis is shown in (Table 1). Records revealed that 78% of the patients had stage

2 cancer when diagnosed, 14% had stage 1 and 8% had stage 3 cancer when it was diagnosed.

Association between stage of cancer and personal history

Data reveals that there existed a clear relationship between the oral hygiene of the patients and the stage of the tumour (Table 2). Only 28% patients were having good hygiene. The table 2 shows a significant association (p<0.05) between oral hygiene and stage of cancer. Out of total 8 cases presenting with stage 3 disease, 6 had poor oral hygiene. No patient with good oral hygiene had stage 3 carcinoma. Only 2 patients out of 40 with fair oral hygiene had stage 3 carcinoma.

Table 2 illustrates that all the patients of stage 3 cancer have been using tobacco for more than 29 years. Out of a total of 36 patients who were using tobacco for more than 29 years, 8 had stage 3 cancer and 24 had stage 2 cancer, only 2 patients had stage 1 cancer. Statistically significant association (p<0.05) exist between stage II and III cancer and duration of tobacco use. Patients more than 10 years of tobacco use having 90% more chance of being in stage II. A significant association (p<0.01) was also seen between the rural/urban patients and the stage of cancer. Out of 8 patients who had stage 3 cancer, 6 (75%) were from rural areas and only 2 (25%) were from urban areas which suggests need to have primary and secondary prevention facility in rural areas.

Duration of hospital stay

Duration for which patients stayed in the study hospital for the treatment varied from a minimum of 5 days to a maximum of 19 days. The mean stay period was 9.45 days with a standard deviation of 3.05 days. The mean duration

consistently increased with advancement of cancer stage. The mean duration of hospital stay for the stage 1 patients was 7.29 days, for the stage 2 patients it was 9.49 days while it was 12.88 days for stage 3 patients. Of the total sample, 96% were admitted under surgical oncologist and 4% were admitted under radiation oncologist. Surgery was the main treatment modality used for all the patients.

Expenditure on Treatment

Expenditure records of patients selected through random sampling procedures were studied to analyse expenditure on various treatment items during their stay in the hospital. Details are given under various heads in Table 3. The category 'hospital stay charges' includes the charges as room rent, OT charges, rent for post-operative ward and the charges for surgical ICU. The consultant charges includes consultation fees of the primary consultant, other consultant fees whose opinion might have been taken in the course of treatment. The 'surgery charges' means the amount of money charged by the hospital as surgery fees for the patient. The reason for taking 'surgery charges' as a separate variable is that the cost of surgery is a major portion of the total treatment expenditure. The expenditure on 'bed-side procedures' include cost on wound debridment, dressing, suture removal etc. Some patients did not need any bed-side procedure during treatment. Most of the patients had to undergo some basic investigations before surgery as 'pre-operative investigations'. However some patients required more investigations than other patients depending upon their age, stage and type of tumour, co-morbid conditions etc. The investigations ranged from biochemical,

Table 1. Distribution of Patients as Per their Morbidity Conditions and Diagnosis

Co-morbidity	None	60%
	DM	4%
	HTN	12%
	CAD	2%
	More than One co-morbid condition	22%
Diagnosis	Ca Tongue	46%
	Ca Buccal Mucosa	42%
	Ca Lip	2%
	Ca Retromolar trigone	4%
	Ca Floor of Mouth	6%
Stage of tumour	Stage 1	14%
	Stage 2	78%
	Stage 3	8%

Table 2. Distribution of Patients as Per their Stages of Cancer and Related Characteristics

		Stage of tumor			
		1	2	3	Total
Oral Hygiene	Good	10	18	0	28
	Fair	4	34	2	40
	Poor	0	26	6	32
	Total	14	78	8	100
Duration of tobacco use	0-9	0	4	0	4
(years)	10-19	4	14	0	18
	20-29	4	12	0	16
	>29	4	24	8	36
	NA	2	24	0	26
	Total	14	78	8	100
Rural/Urban	Rural	0	22	6	28
	Urban	14	56	2	72
	Total	14	78	8	100

Table 3. Distribution of Patients as Per their Expenditure on Treatment

Expenditure Items	Minimum	Maximum	Mean (%)	Std. Dev
Hospital Stay charges	4000	55000	13781.00 (9.43%)	9797.500
Consultant charges	1500	19000	6726.40 (4.60%)	3576.089
Surgery charges	35495	139695	82625.94 (56.56%)	21013.377
Bed Side Procedure charges	0	4565	1098.40 (0.75%)	1183.519
Investigations charges	3564	25273	11608.70 (7.95%)	4140.941
Medicine charges	0	1071	208.62 (0.14%)	207.370
Minor OT procedure charges	0	11620	1200.66 (0.82%)	2215.111
Monitoring charges	550	5400	1541.24 (1.05%)	875.413
OT material and Main OT store charges	9756	28422	14529.60 (9.95%)	3636.769
Total billed amount in Study Hospital	72401	228919	146092.78	37325.936

hematological, microbiological, pathological, ECG, Blood as analysis as basic investigations required for all the patients; CT and/or MRI, Echocardiography etc were major investigations (expenditure wise) for some of the patients. 'Minor OT procedure' charges include wound dressing, suture removal, central line insertion etc as part of the treatment . OT material and Main OT store charges include the charges of all the consumables e.g. syringes, masks, gloves etc and all the anaesthetic and other medicines used during the surgery.

Regarding cost of medicine, the hospital's policy was to get all the required medicines from the hospital pharmacy/outside shops on cash payments. So the hospital bill did not reflect the actual amount spent on the medicines. The expenses shown in the hospital bill against 'medicine charges' reflected only those expenses when patients' attendants were not available at that particular moment during treatment and the hospital procured medicine itself and charged for them in the hospital bill. Usually medicine expenditure are quite high but the mean expenditure on medicines shown was Rs. 208.62 which seems to be inappropriate (Table 3).

As mentioned earlier, surgery was the main treatment modality employed for all the oral cancer patients, the radiotherapy and chemotherapy charges were NIL for all the patients. The total treatment costs of patient for treatment of oral cancer in the study hospital ranged from minimum Rs. 72,401/- to maximum of Rs. 2,28,919/-. The mean expenditure was Rs. 1,46,092.78/-. The figures in the table 3 reveal that highest expenditure was on surgery accounting for 56.56% of total expenditure. The mean expenditure on surgery was Rs. 82625.94/-. The surgery charges ranged from minimum Rs.35,495/- to maximum of Rs. 1,39,695/-. If we add OT material charges, this expenditure increases to 66% of total expenses.

The expenditure on hospital stay accounted third highest expenditure (9.43%). The mean amount of money spent on hospital stay was Rs.13,781/-. Under this head,there was highest difference in the range with minimum as Rs.4,000/- and maximum as Rs.55,000/- except expenditure head surgery where it was due to stage of cancer and associate stay in hospital.

This is worth to mention that out of the 100 study patients, 10 patients' record showed the expenditure incurred outside study hospital; 6 patients spent between Rs. 3,000-5,000/- and 4 had to spent Rs. 5,000- 6,000/- basically on diagnostic facilities. These expenses were incurred mainly in the form of investigations such as CT/ MRI/ Echocardiography etc which the patients got done from outside mainly for personal/feasibility reasons. These expenses were not clubbed with the hospital expenses. None of the patient had any type of medical insurance or external support and all patients had to bear their treatment expenditure personally.

Monthly income versus treatment expenditure
It was seen that the treatment expenditure varied with the monthly income of the patient, also. The mean expenditure for treatment for the patients who had monthly income of less than Rs. 10,000 was Rs. 1,35,000/- while it increased to Rs.1,61,000/- for patients with monthly income of Rs. 10,000 to Rs 20,000/-. The mean treatment expenditure for the group having a monthly income of more than Rs. 20,000 was Rs. 1,66,000/-.Only possible explanation seems that higher income patients may be spending more on stay charges.

The mean expenditure for the group of patents with monthly income of less than Rs. 5000 was Rs.1,38,000/- and those with monthly income of Rs 5000-10000 it was Rs. 133,000 which does not seems to be much different.

Stage of cancer vs treatment expenditure
The mean expenditure for treatment was Rs. 1,49,995.29/- for stage 1 patients, Rs. 1,41,621.36/- for stage 2 patients and Rs. 1,82,859.75 for stage 3 patients. It may be seen that there is not much difference between the costs incurred in treatment of stage 1 and stage 2 patients but the cost has risen significantly for stage 3 patients.

Consultant specialty vs treatment expenditure
The mean expenditure for the patients admitted under surgical oncologist (96%) was Rs. 1,45,777.35/- while it was Rs.153,663/-. for patients admitted under Radiation oncologist (4%) which is because of cost on treatment procedures.

Knowledge, attitude and practice (KAP) of oral cancer patients
Regarding knowledge about tobacco, 70% said that original form of tobacco is leaf, 46% said that the poisonous substance in tobacco is nicotine, 48% of the patients said that tobacco acts as a slow poison, 24% said it is a stimulant and 26% said they don't know the action of tobacco.

Majority (94%) knew that tobacco is used in all the forms i.e. for smoking, chewing and inhalation. 42% knew that regular use of tobacco mean 'addiction' while 38% responded that regular use of tobacco is a 'habit'. 54% said that prolonged use of tobacco can cause ulcers, bronchitis and cancer while 46% said that tobacco causes cancer only. 76% of the patients knew that common cancer among tobacco chewer is 'oral cancer'. This is an expected response as all the patients were follow up cases of oral cancer. 22% of the patients however responded that they don't know which cancer is common in tobacco chewers. 58% said that they learnt about ill effects of tobacco from media while 24% said they learnt from media, family and friends.

Tobacco consumption among cancer patients
Regarding initiation of tobacco, 34% said that they were introduced to using tobacco products by their friends and 26% said that they started using tobacco themselves.

On further probing, 50% said that no one in their family used tobacco while 32% said that other members of their family also uses tobacco. Highest patients (36%) said that they used tobacco 5-10 times per day while 26% said they used tobacco 10-15 times per day. Higher percentage (40%) of the patients were using tobacco for 20-29 years and 18% were using it for more than 30 years. Highest (40%) patients had started using tobacco for pleasure, 16% for self-esteem and 14% for concentration. Out of the 78

Table 4. Behaviour of Tobacco Consumption among Oral Cancer Patients (n=100)

Introduced habit of Tobacco		Family members uses tobacco		Frequency of usage of tobacco in a day		How long have you used/been using Tobacco		Reason to start use of tobacco		Had Cancer because of Tobacco	
Family	16	Yes	32	2-4 times	4	<10 years	6	Frustration	8	Yes	44
Friends	34	No	50	5-10 times	36	10-19 years	14	Pleasure	40	No	6
Media	2	Don't know	18	10-15 times	26	20-29 years	40	Self-esteem	16	Don't know	28
None	26			>15 times	6	>30 years	18	Concentration	14	NA	22
NA	22			NA	28	NA	22	NA	22		

users of tobacco, only 44(56%) said that they believed that they had cancer because of tobacco. Rest 28(36%) patients responded that they don't know why they had cancer and this ignorance demands stronger IEC against tobacco consumption (Table 4).

Opinion and attitude regarding tobacco use

Total 36% agreed/strongly agreed that using 'tobacco gives them status', 36% were uncertain and only 28% disagreed probably which means recognition among peers as tobacco still considers part of socialization process in low socio-economic communities. Further 28% said that tobacco is essential for self-esteem; while 54% were uncertain if is essential for self-esteem. About impact of tobacco, 60% of the patients agreed that tobacco is becoming a grave health problem but 34% were uncertain. Regarding differentiation in products, 32% patients said that costlier tobacco products are safer while 52% were uncertain of this but 16% disagree. 64% who agreed/ strongly agreed that tobacco relieves their tension and 28% said they were uncertain and 8% disagreed/ strongly disagreed to this. Thus, it appears that the IEC programme needs to consider knowledge about harmful effects, attitude, social pressure etc to be more effective in community.

Attitude regarding quit tobacco

Regarding the role of mass media, 92% agreed/ strongly agreed that mass media plays a very important role in developing tobacco use habits among individuals.

The 76% agreed to the question that "quit tobacco now or it will eat you" while 22% were uncertain. 92% agreed that quitting tobacco is must for healthy life. As a prevention strategy, 98% agreed that students should be properly educated about the tobacco and its ill effects and 84% agreed to the suggestion that they will teach their children about the harmful effects of tobacco. 16% were uncertain of this. This suggests patients with such attitude must be used as peer educator against tobacco consumption.

On further exploring about facts relating to 'quit tobacco', 36% said that help to 'quit tobacco' can be sought from 'rehabilitation centres' and 40% said from hospitals. 24% responded they don't know. Out of 78 tobacco users, 60 (77%) said that they never received help to quit tobacco while 18(23%) have received help to quit. It may be mentioned that out of 78 tobacco users only 6 were successful in quitting.

As a drastic measure for 'quit tobacco', 44% were of the opinion that it should be banned,6% said it should not be and 50% said that they don't know if tobacco should be banned.

Discussion

The mean period of main complains being 11 months shows that patients came for treatment at late stages which often quoted from other sources too (ICMR-NCRP 2011). A significant association between tobacco use and alcohol use(p<0.01) shows vicious nexus of use of tobacco, alcohol and addiction is inculcated due to lack of awareness in the society. In our study 22% had more than one associated co-morbid condition (DM/HTN/ CAD etc) which might have increased their hospital stay, complications of treatment and surgery and as a result escalated their treatment costs.

Most of the patients in the study were early stage (stage 1 and stage 2) oral carcinoma (92%) and very few cases were stage 3 oral carcinoma (only 8%). Therefore, the study mainly reflects the true burden for early stage cases. The treatment costs of the late or advanced disease oral cancer patients is usually quite high, as the treatment period is very long and they have more complications during treatment. Such findings in the study conforms to studies conducted elsewhere (Joshua et al., 2008).

The estimates emerged from this study, seems to be lower side as it did not include medicine cost because it was not part of hospital records. This cost is very high specially in case of cancer treatment. Moreover, this study does not include important expenditure under 'indirect expenditure head' borne by patients may be on attendants, food, transportation etc. The 'opportunity cost', ie wage loss etc was also not added.

Findings of the study should be interpreted with due care because patients in the study group were taken from early stage (stage II and III) oral carcinomas only for whom surgery was the treatment modality employed. The patients who had undergone chemotherapy and radiotherapy sessions were more likely to be suffering from advanced stages of the disease, so not included in the study group, reason being such patients continue treatment for long due to continued Radio Therapy/Chemo Therapy sessions, their complications due to co-morbidity, surgery complications, palliative treatment etc, and did not complete treatment during our reference period, so did not fulfil inclusion criteria.

There exist a clear relationship between the oral hygiene of the patients and the stage of the tumour. This may be explained by the fact that patients with poor oral hygiene habits are likely to have the more aggressive forms of oral carcinoma in which the disease advances rapidly to advanced stages. There can be any number

of reasons for this association e.g. patients were heavy tobacco chewers, they were from rural background, they were from low socio-economic strata of the society, their occupation and educational level had a bearing on the oral hygiene habits and so on.

A significant association was also seen between the rural/urban patients and the stage of tumour. This may be due to the fact that patients from rural background were not so much aware about good health, maybe there was a lack of medical facilities and expertise to diagnose and treat oral cancer in early stages, being from low income groups and delayed the expensive treatment for a long time and so on. This requires larger sample to establish facts.

The mean duration of stay period was 9.45 days. The mean duration of hospital stay for the stage 1 patients was 7.29 days, for the stage 2 patients it was 9.49 days while it was 12.88 days for stage 3 patients. It shows a significant increase in the duration of hospital stay for the treatment with the stage of the disease also resulting increase in expenditure.

Study reveals that people with prolonged use of tobacco are higher risk of oral cancer. It seems that there is synergy between Tobacco and alcohol especially among lower socio-economic class. There seems to be association between behavioural factors, hygiene condition and occurrence of disease. Study revealed that majority of treatment expenses (66%) are related to surgery which is influenced by stage of disease which in-turn affected by the oral hygiene status. Lot of misinformation and attitudinal problem exists which require different health education approach specially peer education and involvement of NGOs.

There is a strong need to strengthen primary and secondary prevention activities under the primary health care approach. Large research studies involving government and private hospitals need to be carried out to estimate the treatment costs of oral cancer. There is need to focus 'quit tobacco' programme right from early adolescents age ie 13 years to ensure that children do not start tobacco use for fun or under peer influence. A separate fund for educating people about harmful effect and treatment of oral cancer may be created by taxing tobacco producing and marketing companies.

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