Original Research

Effect of National Tobacco Control Programme (NTCP) on the Clinical Presentation of Oral Cancer in a Tertiary Care Center of Northern India

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Abstract

Background: Tobaccouseis very common in India. It is preventable cause for almost all the cancers. Main effect of tobacco usage which is becoming alarming for India is Oral cancer. In India, oral cancer is the most common cancer in men and the fourth most common cancer in women. It is the primary cause of cancer-related death in men. A National Tobacco Control Programme (NTCP) was launched in India to control excessive tobacco use. By means of this study we want to see the change in clinical presentation of oral cancer patients coming to a tertiary care center after 15 years of NTCP.

Methods: Oral cancer patients registered in the year 2004-2006 (before NTCP, group A) and 2022-2023(after NTCP, group B) in the radiotherapy department at Sarojini Naidu Medical College (SNMC), Agra were evaluated. Characteristics of oral cancer and the tobacco use behaviour were noted. Collected data was analyzed statistically.

Results: Number of oral cancer patients has increased from 32 in 3 years (2004-2006) to 549 in 2 years (2022-2023). Proportion of patients who smoke <1 packet/day has decreased among oral cancer patients. Chewable tobacco use has remained same. Proportion of patients presenting 1st time in hospital having symptoms of oral cancer for <3 months has increased and >12 months has decreased significantly. There is no significant change in the overall staging of oral cancer patients.

Conclusion: Among oral cancer patients' chewable tobacco has not decreased even after so many years of NTCP implementation. Oral cancer patients have now started seeking help sooner probably because of increased awareness among society. NTCP can become more effective by controlling availability of chewable tobacco in society, by promoting nicotine replacement therapy and other treatment plans to help patients quit.

Key words: NTCP, Tobacco use, Oral cancer.

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Introduction

In 2022, around 253.0 million adult Indians (200.2 million males and 53.5 million females) were usingsome form of tobacco products. In tobacco usage, India comes at 2nd position all over world and 1st in South-East Asia Region[1]. In India, 38% of men and 9% of women age 15 and over currently use any tobacco products as per National Family Health Survey 2019-21[2]. Smoke tobacco is generally being used in the form of bidis, cigarettes, cigars, hookah or chillum, and the smokeless tobacco in form of betel quid, gutka, or khaini.

A major portion of worldwide head and neck cancer cases occur in Asia and India is the leading country in Asia contributing to this number[3]. India accounts for one-third of oral cancer cases in the world[4]. As per International Agency for Research on Cancer (IARC) project in India, oral cancer is the most common cancer among males (16.1% of all cancers) and fourth most common in females. Oral cancer is the most common cause for the cancer- related deaths among males as per IARC[5].

Seeing the high tobacco use and its detrimental effects, a National Tobacco Control Programme (NTCP) was launched by Government of India in year 2007-08 with the aim to (1) Decrease the production and dispensing of tobacco products (2) Educate and aware society about the injurious effect of tobacco usage (3) To assist people in quitting tobacco consumption (4) To ease the execution of schemes of prevention and control of tobacco recommended by World Health Organization (WHO)(5) Effectively implement "the cigarette and other tobacco products act 2003" (COTPA)[6]

As per Global Adult tobacco survey (GATS-2 India 2016-17)(7), the tobacco use has reduced by 6% as compared to GATS-1 (2009-10)[8]. As per Global Cancer Observatory: CANCER TODAY (GLOBOCAN), annual incidence of oral cancer has increased from 880/100,000 people (2018)[9] to 1000/100,000people (2022)[5]. This increase in incidence of oral cancer can be because of the effect of early detection, and easier referral by the society due to the expansion of awareness by NTCP. If smoother referral is the case, then the clinical picture of the cancer patients coming to hospital should get changed. By means of this study we want to see the effect of NTCP over the change in clinical presentation of oral cancer.

Material and Method

Medical record of oral cancer patients was taken from the Department of Radiotherapy, Sarojini Naidu Medical College, Agra from Jan 1, 2004, to Dec 31 2006 and from Jan 1, 2022, to Dec 31, 2023. All the patients had given consent before treatment that their clinical information can be used for future research purposes.

The cases included in this study were histopathologically or cytopathologically proven oral cancers. The patients were divided into two groups, Group A (Patients registered in year 2004-2006, before start of NTCP) and Group B (Patients registered in year 2022-2023, after 15 years of NTCP implementation). Other cancers of the head and neck except oral cavity cancers were excluded from the study. Data was collected for involved subsite, age, gender, stage of the disease, symptoms (its duration)&substance abuse history (tobacco chewing, smoking, and alcohol), with their amount and duration for both the groups.

Patients were grouped into subsites such as lip, alveolus, floor of mouth, buccal mucosa, tongue, palate, and retromolar trigone (RMT) as per ICD coding. Each case was noted for tumor, nodal and group staging. Cases were restaged (group A) and staged (group B) according to the American Joint Committee on Cancer (AJCC) cancer staging manualeighth edition[10], as per the available data.

Both the groups were compared using Chi-square test.

Result

Data of 32 and 549 cases of oral cancer were collected from the medical record between period of 2004-2006 and 2022-2023 respectively. Our Table 1 shows the sociodemographic details, tumor staging and subsite involvement of the patients. Male to female ratio (7:1 in Group A and 5:1 in Group B) is significantly high in both the groups. Difference in the sex ratio and the age of the patients between two groups were not statistically significant. Proportion

of patients with T3 staging was 37% in group A and 22% in group B, while proportion of patients with T2 staging was18% in group A and 36% in group B. The difference in T2 and T3 staging was statistically significant among the groups. Looking at the N-staging, percentage of patients with N0 staging was 6% in group A and 26% in group B, while percentage of patients with N2 staging was 50% in group A and 25% in group B. The difference in N0 and N2 staging was statistically significant among the groups.On comparing the two groups, in group Blips and alveolus involvement as subsites has decreased while buccal mucosa has increased significantly.

Table 1: Depicting sociodemographic details and tumor characteristics of the patients in group A and group B.

Demographic and clinical details of oral cancer	Group A (n)	Percentage (%)	Group B (n)	Percentage (%)	P-Value
Gender					0.5792
Male	28	87.5	460	83.8	
Female	4	12.5	89	16.2	
Age (in years)					
<40	8	25	165	30.05	0.5440
40-65	22	68.75	318	57.92	0.2272
>65	2	6.25	66	12.00	0.3254
T staging *					
T1	0	0	35	6.35	0.1418
T2	6	18.75	200	36.42	0.0424
T3	12	37.50	122	22.22	0.0463
T4	14	43.75	192	34.97	0.3133
N staging *					
Nx	0	0	11	2.00	0.4197
N0	2	6.25	146	26.59	0.0103
N1	10	31.25	152	27.68	0.6618
N2	16	50.00	142	25.86	0.0029
N3	4	12.50	98	17.85	0.4397
Group staging*					
I	0	0	17	3.09	0.3133
II	2	6.25	60	10.92	0.4058
III	12	37.50	166	30.23	0.3862
IV	18	56.25	306	55.73	0.9541

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Subsite distribution					
Lip					
FOM	2	6.25	5	0.91	0.0071
Tongue	2	6.25	11	2.00	0.1141
BM	12	37.50	149	27.14	0.1968
Palate	8	25.00	308	56.10	0.0006
RMT	0	0	35	6.38	0.1408
Alveolus	0	0	12	2.19	0.3980
	8	25.00	29	5.28	<0.0001

*T (Tumor), N(Nodal), and group staging was done as per AJCC (Eighth Edition).

Table 2 reveals that the percentage of patients who only use smoke tobacco has decreased significantly (p<0.0001) in group B (7%) as compared to group A (28%). Patients who use all three types of substance (chewable tobacco, smoke tobacco and alcohol) has increased significantly (p = 0.0014) in group B (29%) than to group A (3%). Proportion of patients who use chewable tobacco has not changed significantly.

Table 2: Distribution of substance abuse among oral cancer patients

Detrimental habits	Group A (n)	Percentage (%)	Group B (n)	Percentage (%)	P value
Smoking Tobacco alone	9	28.12	40	7.29	<0.0001
Chewing Tobacco alone	8	25	130	23.68	0.8647
Alcohol alone	1	3.12	5	0.91	0.2295
Smoking and chewing tobacco	6	18.75	118	21.49	0.7133
Smoking Tobacco and Alcohol	3	9.37	40	7.29	0.6625
Tobacco chewing and Alcohol	2	6.25	29	5.28	0.8125
Smoking, Tobacco chewing and Alcohol	1	3.12	160	29.14	0.0014
None	2	6.25	27	4.92	0.7373

In table 3, it is shown that there is not much reduction of tobacco and alcohol usage among oral cancer patients in Group B.

Table 3: Amount of different substance used by oral cancer patients

Substance	Amount	Group A (n)	Percentage (%)	Group B (n)	Percentage (%)	p-value
		n= 17		n=437		
Chewable tobacco (packets per day)	≤1	5	29.41	177	40.50	0.3605
	2-3	4	23.52	114	26.08	0.8843
	≥4	8	47.05	146	33.40	0.2440

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		n=19		n=360		
Smoke tobacco (packs per day)	<1	7	36.84	60	16.67	0.0249
	1	7	36.84	187	51.94	0.2000
	>1	5	26.31	113	31.39	0.6416
		n=7		n= 237		
Alcohol (quarter per day)	≤1quater	5	71.42	147	62.02	0.6138
	>1 quarter	2	28.57	90	37.97	0.6138

Table 4 shows that the percentage of patients with symptoms for <3 months has increased significantly (p-value <0.0001) in group B (39%) as compared to group A (2%) and proportion of patients with symptoms >12 months is significantly higher (p-value 0.0001) in group A (18%) as compared to group B (3%).

Table 4: Duration of symptoms before coming for treatment of oral cancer

Duration between start of symptoms and 1st visit (months)	Group A n (%)	Group B n (%)	p-value
<3	2 (6.25)	218 (39.70)	<0.0001
3-6	14 (43.75)	191 (34.79)	0.3029
6- 12	10 (31.25)	119 (21.67)	0.2053
>12	6 (18.75)	21 (3.82)	0.0001

Discussion

Many health problems are associated with the tobacco consumption. To reduce its usage, Government of India had taken a major step, by bringing NTCP in year 2007-08. The main focus of this program was to spread awareness in the country regarding detrimental effects of tobacco usage. As the surveys report that there is some reduction in the tobacco use in these many years[7], the incidence of oral cancer has increased[5]. This increase in the incidence of oral cancer may be due to the improvement in knowledge among the general population regarding the problems associated with tobacco use, leading to more help seeking and detection. In this study we want to see the effectiveness of NTCP and its result on the presentation of patients of oral cancer coming to hospital for treatment.

Male to female ratio of oral cancer patients in our study has decreased from 7:1 in group A to 5:1 in group B, showing the increasing trend of oral cancer in females. This increment can be due to the increased tobacco use in females[11]. Male to female ratio of oral cancer patients as per survey GLOBOCON 2022 is 3:1[5]. This increased number of females in the survey as compared with this study is due to the difference in the population covered. This study involves the hospital patients.

As compared to group A, group B has significantly more proportion of patients having T2 and N0 staging and less proportion of patients having T3 and N2 staging. In 'Group Staging', proportion of patients having Stage I and II is higher in group B as compared to group A and proportion having Stage III and IV is lower in group B than to group A. This trend in group staging is not statistically significant. This increased early presentation in group Bas compared to group A can be due to the impact of NTCP. Although having improving trend in early detection, most of the patients still present in advanced stages (III and IV). It further opens the scope to strengthen the NTCP by expanding knowledge about the presentation of oral cancer.

This study shows that since the start of NTCP there is a significant decrease in the proportion of oral cancer patients who smoke cigarette or bidiin amount <1 pack/day. There is no significant decrease

in the consumption of chewable tobacco. Survey of GATS shows that NTCP has been effective in reducing the tobacco (both smoke and smokeless) use among the general population[7]. The inability to reduce the proportion of patients abusing chewable and smoking (≥1 pack/day) tobacco can be the cause of expansion of oral cancer in India.

Our results display that before coming to hospital for the first time, percentage of patients with duration of symptoms (of cancer) for <3 months has increased and >12 months has decreased after 15 years of administering NTCP in India. This finding can be due to the better screening of cancer in society, upgradation of financial status of general population, empowerment of knowledge about oral cancer presentation in society, improvement in medical facility in rural areas, increased social media coverage and better connectivity of outskirt areas due to urbanization.

Overall, we can say that NTCP has been effective in better detection and early referral of oral cancer patients but not in decreasing tobacco usage among them. FDA approved bupropion, varenicline, and nicotine replacement therapy (NRT) is still not used adequately[12]. In a revised NTCP, we can educate and train the physicians (including other health workers) about the benefits of use of medicines. Increment in the supply of these medicines all over the country can also be made.

In low income country like Philippines, different tobacco control programs were launched between 2002-2005[13,14]. Among adult Filipinos smoking rate has reduced from 34.2% to 23.1% between 2000-2020[15].In developed country like New Zealand's first tobacco control programme began in 1984[16]. Australia, Canada, the UK and Ireland (and many other higher income countries) have similar tobacco control programmes. Smoking rates are declining in all of these countries[17]. In all these countries the incidences of oral cancer is increasing[18,19,20,21,22]. This increment in incidence has been attributed to one or the other risk factor. No study has yet tried finding out the relationship between NTCP and increased incidence of oral cancer in these countries by seeing the change in the presentation of oral cancer with time.

Implications, Limitations and Future Directions

Use of tobacco in oral cancer patients is high and is not decreasing even after 15 years of implementing NTCP. More than four-fifth of the oral cancer patients are coming to hospital in advanced stages. Screening can help in detecting cancer patients in earlier stages. In young population cancer is becoming more prevalent, probably due to excessive tobacco use in this age group. There is scope of increasing the awareness about the harmful effects of tobacco use among youths in school and colleges by NTCP.NTCP can emphasize over quitting the tobacco by making availability of deaddiction medications easily and widely.

It is a retrospective study. As a lot of things has changed (like financial status of people, travel convenience in periphery, advancement in medical facility and the social media coverage) in these 15 years, these factors should also be considered while seeing the effect of NTCP over the change in clinical presentation of oral cancer. In future studies it will be nice to see the source of referral (by friends, family member, teacher, doctor or bystander), level of awareness in the patient and their family members regarding the harmful effects of tobacco use, and the means of knowledge (by person, social media, or/ and photo over tobacco products).

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Ethical Clearance: Not needed.

Conflicts of interest: None

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