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Epidemiology of Oral cancer-A Hospital based case control study in Bengaluru

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Abstract
Back Ground of the Study: *Oral cancer is estimated to be the fifteenth most common cancer and it accounts an age adjusted rate (AAR) of 4.0 persons for every 100,000 population after combining both sexes in global level. In Asia, Oral and lip cancer is ranked ninth most common cancer with AAR 3.8 in both sex. In India oral cancer is found to be third leading site after combining both sex (AAR 7.2), in males it occupies Ist position with AAR 10.1 in females 5th leading position with AAR 4.3 per 100,000 persons. In Hospital based cancer registry (HBCR) oral cancer showed increasing proportion among tobacco related cancer in both sex. Oral cancer is twice as common in men as in women. This difference may be related to the use of alcohol and tobacco in Kidwai hospital based cancer registry and the proportion of male and female oral cancer is same. This study was conducted to know the risk factors associated for oral cancer pattern.*

Material and Methodology: *The study was conducted in Kidwai cancer Institute located in Bengaluru, which is the capital of the state of Karnataka. It is comprehensive center for cancer research and treatment in the state and is one of the Regional cancer center in India. To study risk factors, prospective case control study was plan Ned. The information on exposure factor was collected through direct personal interview method using structure questionnaire prepared based on old review and experts opinion. Only microscopically confirmed cases were including in the study, one case per control was matched for sex and age group was selected. 300 cases and equal number of control selected for the study. A descriptive statistics along with odds ratio estimate the effects of different variables on oral cancer.*

Results: *There were more proportion of women (55%) than men (44%). The mean age group of respondents is 54years. About 67% of cases and 44% of controls are illiterates and 4% in study group and 14% in control groups have completed their college level education. The average income level of cases and controls is 1700 Rs/month and 3600Rs/month respectively. Among 600 respondents, 74% and 26% are tobacco users either in the form of chewing or smoking tobacco. Out of 288 respondents, majority of the cases have tobacco chewing habit (78%) compared to control group which was 22%. 66% of the cases and 33% of controls have smoking habits out of 125 respondents. Odds ratio was found to be significant 2.3 and 10.8 between cases and controls with respect to chewing and smoking habits. The odds ratio between cases and control with respect to only smoking, alcohol and Smoking+Alcohol consumption was not found significant. Only chewing, smoking+chewing and smoking+chewing+alcohol was found significant (P-values 0.001, 0.033, 0.001). Majority of them had the habit of chewing tobacco stem (Kaddipudi) with*

lime and betel leaf. Among 64 respondents, tobacco chewing in the form of leaf (Khaini) 43(67.2%) and 21 (32.8%) with respect to case and control, the odds ratio is statistically significant.

Conclusion: *In this study, a higher chance of oral cancer was found in those who were chewing and smoking tobacco in any form and a strong risk for oral cancer is proved from chewing with different combination. Alcohol and smoking alone has not proved the association with oral cancer, it may be due to high proportion of women respondents or combined males and female respondents for analysis.*

Keywords: *Case control study, AAR-age adjusted rates, Annual percentage change, Hospital based cancer registry, Odds ratio, Tobacco related cancer.*

Introduction

Oral cancer is estimated to be the fifteenth most common cancer in the world. It accounts for an age adjusted rate (AAR) of 4.0 persons for every 100,000 population, after combining both sexes in global level. In Asia, Oral and Lip cancer is ranked ninth most common cancer with AAR of 3.8 in both sex. However, it is relatively rare in European and North American countries. In India oral cancer is found to be third leading site after combining both sex (AAR 7.2). In males, it occupies 1st position with AAR 10.1 and in females 5th leading position with AAR 4.3 per 100,000 persons [1]. In Population based cancer registry, tobacco related cancer incidence rates decreased among women significantly [annual percentage changes (APC –0.65%), though not among men (APC - 0.10%).

 In HBCR, increasing trend in tobacco related cancer is observed in males. Most of the tobacco related cancer sites showed increasing trend in oral cavity and lung in females. Age of diagnosis is less in rural area compared to urban[2]. In Population based cancer registry of Bengaluru (PBCR), the mouth cancer trend in both males and females is showing decreasing trend, where as tongue cancer is showing increasing trend[3]. In hospital based cancer registry, all oral cancer percentage is increasing every year [4].

Oral cancer is twice as common in men as in women. This difference may be related to the use of alcohol and tobacco, a major oral cancer risk factor that is seen more commonly in men than women. In Kidwai hospital based cancer registry, more women oral cancer cases were registered compared to men. More than 80% of oral cancer patients come to Kidwai Cancer Institute from rural and semi urban area (Other than Bengaluru)

hence, this study was conducted to know the risk factors associated with increasing Oral cancer pattern.

Material and Methodology

The study was conducted in Kidwai Cancer Institute, located in Bengaluru, which is the capital of the state of Karnataka. It is comprehensive center for cancer research and treatment in the state and is one of the Regional cancer centers in India. To study risk factors, prospective matched Case control study was planned.

A case was defined as a person aged more than 25 years and above with pathologically confirmed primary diagnosis of Oral cancer according to ICD10. Cases selected randomly that were histopathologically diagnosed as oral cancer on or after January 2015 to June 2017 visited the hospital during the study period were included.

A control was defined as a person aged more than 25 years who visited Kidwai Cancer hospital along with cancer patient. People with any other malignancy and/or people suffering from any disease associated with the study exposures were excluded.

The information on exposure factor was collected through direct personal interview method using structure questionnaire prepared based on old review and experts opinion. Data was collected during first presentation of patients at the time of registration and simultaneously from the attendants of cancer cases staying at ambulatory patient home. Among the suspect cases, those cases after microscopic confirmation were included in the study, one case per control was matched for sex and age group was selected. 300

cases and equal number of control was selected for the study.

Analysis

Difference between case and control with respect to habitat and diet factor was analysed using R statistical software. A descriptive statistics along with odds ratio estimate, the effects of different variables on Oral cancer. Univariate analysis was done to find the effect of each variable [5].

Results

Fig- 1 shows the distribution of case and control group with respect to sex. There were more females (55%) than males (44%). 300 cases and equal number of controls are selected for the study. The mean age group of respondents is 54years, similar age distribution was observed between cases and control. About 67% of cases and 44% of controls are illiterates, about 18% in study group and 19% in control groups completed primary education, 10% in cases and 21% in controls completed their secondary education. Only 4% in study group and 14% in control groups completed their college level education. The average income level of cases and controls is 1700 Rs/month and 3600 Rs/month respectively.

Table-1 shows that, among 600 respondents, about 74% and 26% are tobacco users either chewing or smoking tobacco. Out of 288 subjects, majority of the cases are habitual tobacco chewers (78%), compared to control group (22%). 66% of the cases and 33% controls have smoking habits out of 125 respondents, odds ratio is found significant 10.8 and 2.3 between cases and controls with respect to chewing and smoking habits.

Table-2 gives the distribution of different combination of habits among the 300 cases, 59% had the only chewing habit compared to 19% among controls. Among the 24 cases, 8.0% had the habit of smoking compared to 6.0% among the controls. The odds ratio between cases and control with respect to only smoking, alcohol and Smoking+Alcohol consumption is not found significant with 5% level of significance. Only chewing, smoking+chewing and smoking+chewing+alcohol was found significant (P-values 0.001, 0.033, 0.001).

Further univariate analysis was carried out to know the effect of different chewing habits. Out of 284 chewing habits in cases and controls,). Majority of them had the habit of chewing tobacco stem (Kaddipudi) with lime and betel leaf. Among 64 respondents, tobacco chewing in the form of leaf (Khaini) 43(67.2%) and 21 (32.8%) with respect to case and control, the odds ratio is statistically significant. The detailed analysis showed in table-3.

Table No1: Different types of Tobacco and Alcohol Habits in Cases and Control

Habits	Cases (300)		Control (300)		Total	Odds Ratio	P-value
	#	%	#	%			
Smoking Tobacco	83	66.4	42	33.6	125	2.3	0.001
Chewing Tobacco	224	77.8	64	22.2	288	10.8	0.001
Any Form Tobacco	274	74.3	105	25.7	379		
Alcohol	74	64.9	40	35.1	114	2.1	0.005

Table No 2: Different Forms of Combination in Cases and Control

Habits	Cases		Control		Total	Odds Ratio	P-value
	#	%	#	%	#		
Only Smoking	24	8.0	18	6.0	42	1.7	0.2752
Only Chewing	177	59.0	58	19.3	235	9.2	0.001
Only Alcohol	5	1.7	13	4.3	18	0.1	0.106
Smoking+Chewing	15	5.0	7	2.3	22	4.4	0.033
Smoking+Alcohol	12	4.0	7	2.3	19	2.8	0.184
Smoking+Chewing+Alcohol	31	10.3	9	3.0	40	11.4	0.001
No Habit	23	7.7	186	62.0	209	0.01	0.001
Total	300	100	300	100	600		

Table No 3: Different Forms of Chewing Habits in Cases and Control

Habits	Cases		Control		Total	Odds Ratio	P-value
	#	%	#	%			
Only Gutka (A)	12	70.6	5	29.4	17	5.4	0.003
Only Tobacco Leaf (B)	43	67.2	21	32.8	64	4.1	0.001
Only Tobacco Steam+Lime (C)	83	90.2	9	9.8	92	8.8	0.001
Chewing Habit	226	79.6	58	20.4	284	20	0.001
Chewing Habit+Liquore	61	71.8	24	28.2	85	6.3	0.001
No Chewing Habit	67	22.9	226	77.1	293	0.08	0.001

Fig1: Gender wise Distribution of Cases and Control
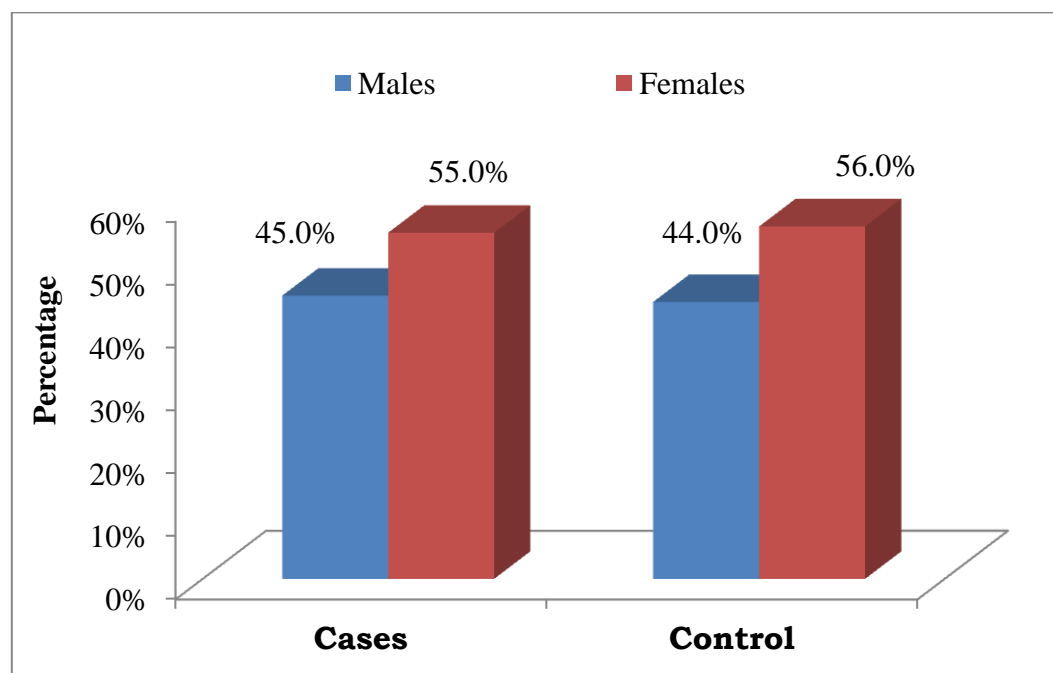
Discussion

The respondent who have smoking habit were 2.3 times more likely to get oral cancer compared to people who did not smoke, the findings were similar to study conducted at Pune by Madani A.H et al, the frequency of smoking in cases were significantly higher than control group[6]. Only smoking and smoking with alcohol fails to establish association, many others studies have proved association between smoking tobacco which causes oral cancer [8-9], the reason for failure in association between smoking and oral cancer may be due to high proportion of women in this study. The study conducted by P C Guptha.et al showed very minimal Self-reported tobacco use among males was as follows: urban 35.2%; urban-slums 48.3%; and rural 52.6% (P value <0.05). Self-reported tobacco use among females was as follows: Urban 3.5%; urban-slums 11.9%; and rural 17.7% (P value <0.05). More males reported daily bidi (tobacco wrapped in temburini leaf) smoking (urban 17.8%, urban-slums 36.7%, rural 44.6%) than cigarette use (urban 9.6%, urban-slums 6.3%, rural 2.9%). Females using smoked tobacco were almost exclusively using bidis (urban 1.7%, 7.9%, 11% in rural) [10].

Chewing+alcohol groups had 4.4 times higher risk of getting oral cancer than controls. In those who were involved in Chewing + alcohol + smoking habit, the risk was 11.4 times more than the controls. The synergistic effects of alcohol, tobacco and betel quid on oral cancer is clearly demonstrated [11]. Similar study in Trivandrum showed the adjusted odds ratios (ORs) for chewers were 3.1 (95% confidence interval (CI) = 2.1–4.6) for men and 11.0 (95%CI = 5.8–

20.7) for women. Effects of chewing pan with or without tobacco on oral cancer risk were elevated for both sexes.

Bidi smoking increased the risk of oral cancer in men (OR = 1.9, 95%CI = 1.1–3.2). Dose-response relations were observed for the frequency and duration of chewing and alcohol drinking, as well as in duration of bidi smoking. Given the relatively poor survival rates of oral cancer patients, cessation of tobacco and moderation of alcohol use remain the key elements in oral cancer prevention and control [12]. The clear positive association exists between tobacco use in any form with oral cancer, A positive association of getting Oral cancers was 5.4 times observed in gutka users compared with non gutka users [13]. Similarly any other tobacco chewing increases the risk of oral cancer [14].

Conclusion

In this study, a higher chance of oral cancer was found in those who were chewing tobacco and smoking in any form and a strong risk for oral cancer is proved from chewing. Alcohol and smoking alone has not proved the association with oral cancer. It may due to high proportion of women sample or combined both the sex for analysis.

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