



RISK OF OESOPHAGEAL CANCER WITH CONSUMPTION OF BETEL NUT, TOBACCO CHEWING, TOBACCO SMOKING, AND ALCOHOL CONSUMPTION

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ABSTRACT **Background:** Cancer is a leading cause of death in the world. The burden of oesophageal cancer varies across different regions of the world and diagnosis is often late. As per an estimate 511,054 people were diagnosed with oesophageal cancer globally, and 445,391 died from the disease in 2022. China, India, and Bangladesh had the highest number of oesophageal cancer cases. Oesophageal cancer is frequently related with several risk factors which are very common in our day to day lives. **Objectives:** To study the non-nutritional risk factors influencing carcinoma oesophagus. **Materials And Methods:** It were a hospital-based case control study where 62 cases and controls have been interviewed, data collected and analysed. **Results:** Non-nutritional risk factors, bidi and/or cigarette smoking was found highly associated with carcinoma oesophagus (Odds ratio 4.42/ P<0.001). Duration of years of smoking and frequency of smoking per day have influence on carcinoma oesophagus. Alcohol consumption is associated with the risk of carcinoma oesophagus (Odds ratio 3.28/ P<0.01). Betel nut consumption and Tobacco chewing (Khoiny) is associated with carcinoma oesophagus (Odds ratio 3.82/ P<0.01 and 3.11/ P<0.01 respectively). Different combination of bidi and/or cigarette smoking with alcohol consumption, betel nut and tobacco chewing have additive influence in developing carcinoma oesophagus. **Conclusion:** A strong relationship is established in between bidi and/or cigarette smoking, alcohol consumption, betel nut and tobacco chewing alone or in combination for varying period and oesophageal cancer.

KEYWORDS : Cancer, bidi, cigarette, betel nut, tobacco, khoiny

INTRODUCTION

The word 'Cancer' conjures up deep fears of a silent killer that creeps up on us without warning. Cancer, evoking such desperation that it has become a metaphor for grief and pain, a scourge straining our intellectual and emotional resources. The numbers are such that each of us will be touched either as a patient, a family member, or a friend.

The term cancer itself describe a group of conditions which are characterised by an abnormal proliferation of cells. Fundamental to the origin of this cancer cells is the loss of responsiveness to the normal growth control mechanism. Each tumour is classified according to its cells of origin, anatomical site, and biological behaviour. Contrary to the common belief associating cancer with industrialisation and urban lifestyle, cancer occurs very frequently in the developing world. Oesophageal carcinoma is a malignant neoplasm arising in the epithelial lining of the oesophagus, which is lined by stratified squamous epithelium and so, oesophageal cancer is predominantly squamous cell type. Adeno carcinoma also arises in oesophagus which is very rare.

Cancer is the second leading cause of death globally, accounting for nearly 10 million deaths, or 1 in 6 deaths, in 2020. Oesophageal cancer is the eleventh most diagnosed cancer and the seventh leading cause of cancer-related deaths globally. The burden of oesophageal cancer varies across different regions of the world. In 2022, as per an estimate 511,054 people were diagnosed with oesophageal cancer globally, and 445,391 died from the disease. China, India, and Bangladesh had the highest number of oesophageal cancer cases (World Cancer Fund).

Oesophageal cancer is the fourth common cause of cancer-related deaths in India. It is prevalent among both men and women. Squamous cell carcinoma accounts for up to 80% of these cancers, although adenocarcinoma is on the increase due to changing lifestyles. The etiological factors show a regional variation in different parts of India, but tobacco consumption in various forms, alcohol, hot beverages, and poor nutrition remain the predominant predisposing factors. Generally, these cancers present late and therefore have a poor prognosis.

In India oesophageal cancer rank 5th in both sexes (5.6%) and in male it ranks 3rd (6.7%) and in female 4th (4.4%). Incidence varies from 1.4 to 11.5 per 1,00,000 population in various regions. The disease is distributed very unevenly in our country regionwise and state wise. In India high percentage of oesophageal cancer incidence was observed in Dibrugarh Cancer Registry (15%), Assam, and low percentage was observed in Trivandrum Cancer Registry (4%), in Kerala. (Cancer Registry Programme, ICMR).

In this study, various risk factors associated with oesophageal carcinoma were studied. The role of various risk factors like consumption of betel nut, tobacco consumption, alcohol consumption alone and in combination were studied.

MATERIALS AND METHODS

The present study was a hospital-based case-control study had been undertaken at Gauhati Medical College and Hospital, Guwahati. The patients suffering from oesophageal cancer, often present with dysphagia (the difficulty in swallowing), with the site of obstruction perceived to be either at the throat or neck. So, the patients often attend the ENT (Ear-Nose-Throat) Department for diagnosis as well as treatment. Taking this opportunity, the present study was conducted at ENT (Oto-Rhino-Laryngology) Department.

Study Population Includes-

- Confirmed cases of carcinoma oesophagus (Histopathologically positive) attending Oto-Rhino-Laryngology Department of Gauhati Medical College and Hospital, Guwahati, during the study period were considered as "cases".
- Controls were taken from patients, other than cancer attending Oto-Rhino-Laryngology Department at Gauhati Medical College and Hospital, Guwahati, during the study period. Matching was done only for age group and sex.

Data Collection Tools- Data were collected in pre-designed, pre-tested schedule.

Period Of Study- The study period was from 1st February 2003 to 29th February 2004, total of thirteen months.

Method Of Collection Of Information-

The proposed study was a case-control study. The "cases" were the patients suffering from carcinoma oesophagus, diagnosed histopathologically by taking biopsy material from the suspected patients attending the Oto-rhino-laryngology Department of Gauhati Medical College and Hospital, Guwahati during the study period. Oesophagoscopy was done to the patients attending Oto-rhino-laryngology Department, suspected to be suffering from oesophageal carcinoma clinically as well as radiologically, and biopsy materials were taken. At that time detailed information were collected from the patient (sometimes help of attendants were also taken) on a pre-designed, pre-tested schedule. Results of biopsy were confirmed during their re-visit for follow up with the biopsy report. Histopathologically non-cancerous patients were excluded from the study.

The "controls" were the patients (other than cancer) attending Oto-Rhino-Laryngology Department of Gauhati Medical College and Hospital, Guwahati during the study period. They were also interviewed, and detailed information were collected on the same pre-designed, pre-tested schedule. One control for each case was taken. Matching was done only for age group and sex.

Analysis Of Data-

The collected data have been compiled, tabulated manually, and presented in the observation chapter. The data were also subjected to statistical test. Being a case-control study, "odds ratio" was used to estimate relative risk and "chi-square" test as a test of significance. All the statistical analysis were done manually.

Objectives Of The Study-

To study the non-nutritional risk factors influencing carcinoma oesophagus and to suggest recommendations based on the study.

Limitations Of The Study-

The present study was a hospital-based case-control study. So, the study results are often dependent on the selection and matching of the cases and controls. Cases of oesophageal carcinoma were not highly available to select under specific criteria. Information was also collected from attending close relatives. Although no stone were left unturned to get the details in depth.

RESULTS-

Table 1: Smoking Habits (Bidi And/or Cigarette) Of Controls And Cases.

Smoking habit	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
No*	41	66.1	19	30.6	4.42
Yes	21	33.9	43	69.4	
Total	62	100	62	100	

$X^2=15.62$, $df=1$, $P<0.001$

NB: *Includes never smoker and those who gave up smoking habit before 20 years or more.

Table 2: Distribution Of Controls And Cases By Cigarette Consumption Habit.

Cigarette smoking habit*	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
No	49	79.0	37	59.7	2.55
Yes	13	21.0	25	40.3	
Total	62	100	62	100	

$X^2=5.46$, $df=1$, $P<0.05$

NB: *Mainly consumed cigarette

Table 3: Distribution Of Controls And Cases By Bidi Smoking Habit.

Bidi smoking habit*	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
No	54	87.1	44	71.0	2.76
Yes	8	12.9	18	29.0	
Total	62	100	62	100	

$X^2=4.86$, $df=1$, $P<0.05$

NB: *Mainly consumed bidi.

Table 4: Distribution Of Controls And Cases According To Number Of Cigarette And/Or Bidi Consumption Per Day.

No. of Cigarette and/or Bidi consumption	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
Did not consume	41	66.1	19	30.6	3.02
<10 per day	10	16.1	14	22.6	
≥10 per day	11	17.8	29	46.8	
Total	62	100	62	100	5.69

$X^2=16.82$, $df=2$, $P<0.001$

Table 5: Distribution Of Controls And Cases According To History Of Duration Of Cigarette And/or Bidi Consumption.

History of duration of Cigarette and/or Bidi consumption	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
Did not consume	41	66.1	19	30.6	2.75
<10 years	11	17.7	14	22.6	
10-20 years	7	11.4	18	29.0	5.55
≥20 per day	3	4.8	11	17.8	7.91
Total	62	100	62	100	

$X^2=17.84$, $df=3$, $P<0.001$

Table 6: Alcohol Consumption Habit Wise Distribution Of Controls And Cases.

Alcohol consumption habit	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
No	52	83.9	38	61.3	3.28
Yes	10	16.1	24	38.7	
Total	62	100	62	100	

$X^2=7.94$, $df=1$, $P<0.01$

Table 7: Distribution Of Controls And Cases According To Number Of Times Alcohol Consumption Per Week.

No. of times alcohol consumption	Controls		Cases	
	Numbers	Percentage	Numbers	Percentage
Did not consume	52	83.9	38	61.3
<3 times per week	4	6.4	8	12.9
≥3 times per week	6	9.7	16	25.8
Total	62	100	62	100

$X^2=8.06$, $df=2$, $P<0.05$

Table 8: Distribution Of Controls And Cases According To History Of Duration Of Alcohol Consumption.

Duration of alcohol consumption	Controls		Cases	
	Numbers	Percentage	Numbers	Percentage
Did not consume	52	83.9	38	61.3
<10 years	2	3.2	2	3.2
10-20 years	2	3.2	4	6.5
≥20 per day	6	9.7	18	29.0
Total	62	100	62	100

$X^2=8.58$, $df=2$, $P<0.05$

Table 9: Distribution Of Controls And Cases According To Alcohol Consumption And Smoking Habit (both).

Consumption habit	Controls		Cases	
	Numbers	Percentage	Numbers	Percentage
Non smoker Non drinker	37	59.7	11	17.7
Smoker non drinker	15	24.2	27	43.6
Non smoker drinker	4	6.4	8	12.9
Smoker and drinker	6	9.7	16	25.8
Total	62	100	62	100

$X^2=23.38$, $df=3$, $P<0.001$

Table 10: Betel Nut Consumption Habit Wise Distribution Of Controls And Cases.

Consumption of betel nut	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
No	18	29.0	6	9.7	3.82
Yes	44	71.0	56	90.3	
Total	62	100	62	100	

$X^2=7.44$, $df=1$, $P<0.01$

Table 11: Distribution Of Controls And Cases According To Number Of Times Betel Nut Consumption Per Day.

Frequency of betel nut consumption	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
Did not consume	18	29.0	6	9.7	2.06
<5 per day	16	25.8	11	17.7	
≥5 per day	28	45.2	45	72.6	4.82
Total	62	100	62	100	

$\chi^2=10.88$, df=2, $P<0.01$

Table 12: Distribution Of Controls And Cases According To History Of Duration Of Betel Nut Consumption.

Duration of betel nut consumption	Controls		Cases	
	Numbers	Percentage	Numbers	Percentage
Did not consume	18	29.0	6	9.7
<10 years*	6	9.7	4	6.4
10-20 years**	5	8.1	6	9.7
≥20 per day***	33	53.2	46	74.2
Total	62	100	62	100

$\chi^2=8.24$, df=3, $P<0.05$

NB: *Those who left the habit after consuming for less than 10 years.

**Those who left the habit after consuming for >10 years but <20 years.

***Those who left the habit after consuming for ≥20 years.

Table 13: Distribution Of Controls And Cases According To Consumption Of Betel Nut Alone, Betel Nut With Lime And Betel Nut With Lime And Tobacco.

Consumption of betel nut, lime & tobacco	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
Did not consume	18	29.0	6	9.7	2.20
Betel nut alone	15	24.2	11	17.7	
Betel nut with lime	21	33.9	28	45.2	4.00
Betel nut with lime and tobacco	8	12.9	17	27.4	6.38
Total	62	100	62	100	

$\chi^2=10.86$, df=3, $P<0.05$

Table 14: Distribution Of Controls And Cases According To Spitting Habit During Betel Nut Consumption.

Spitting habit during betel nut consumption	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
Did not consume	18	29.0	6	9.7	3.28
Spitting during betel nut consumption	32	51.6	35	56.4	
No spitting during betel nut consumption	12	19.4	21	33.9	5.25
Total	62	100	62	100	

$\chi^2=8.6$, df=2, $P<0.05$

Table 15: Distribution Of Controls And Cases According To Tobacco Smoking And Betel Nut Consumption Habit (both).

Smoking and/or betel nut consumption habit	Controls		Cases	
	Numbers	Percentage	Numbers	Percentage
Non smoker Non betel nut chewers	13	21.0	4	6.5
Non smoker Betel nut chewers	28	45.1	15	24.2
Smoker Non betel nut chewers	5	8.1	2	3.2
Smoker Betel nut chewers	16	25.8	41	66.1
Total	62	100	62	100

$\chi^2=20.94$, df=3, $P<0.001$

Table 16: Tobacco Chewing (khoiny) Habit Wise Distribution Of Controls And Cases.

Tobacco (Khoiny) chewing habit	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
No	42	67.7	25	40.3	

Yes	20	32.3	37	59.7	3.11
Total	62	100	62	100	

$\chi^2=9.40$, df=1, $P<0.01$

Table 17: Distribution Of Controls And Cases According To Number Of Times Tobacco Chewing (Khoiny) Per Day.

Frequency of tobacco chewing	Controls		Cases		Odds ratio
	Numbers	Percentage	Numbers	Percentage	
Did not consume	42	67.7	25	40.3	2.61
<5 times per day	9	14.5	14	22.6	
≥5 times per day	11	17.8	23	37.1	3.51
Total	62	100	62	100	

$\chi^2=9.64$, df=2, $P<0.01$

Table 18: Distribution Of Controls And Cases According To History Of Duration Of Tobacco Chewing (khoiny).

Duration of tobacco chewing	Controls		Cases	
	Numbers	Percentage	Numbers	Percentage
Did not consume	42	67.7	25	40.3
<10 years	3	4.8	4	6.5
10-20 years	6	9.7	11	17.7
≥20 per day	11	17.8	22	35.5
Total	62	100	62	100

$\chi^2=9.60$, df=3, $P<0.05$

DISCUSSION

Smoking is a widely prevalent unwanted but common habit in the society. The habit often gets initiated in the school or college life and later become a constant need to some of them. Smoking is harmful due to its local, systemic as well as behavioural effects. During inhalation, local action started from lips to oral cavity, oesophagus, stomach, bronchi, lung, and then systemic effects. Being habit-forming condition, smokers often fail to leave the habit after having the knowledge of its bad effect. Table 1-5 represents distribution of controls and cases according to different smoking habits (Quality, quantity, and duration of smoking).

Table 1 shows distribution of controls and cases according to smoking habit (bidi and/or cigarette). In this study 30.6% cases were found non-smoker and 69.4% were found smokers. Whereas 66.1% controls did not smoke and 33.9% were found to smoke bidi and/or cigarette. Those who consumed bidi, cigarette or both were found to be associated with higher risk of oesophageal cancer (OR 4.42). The association was statistically found significant ($\chi^2=15.62$, df=1, $P<0.001$).

Table 2 shows distribution of controls and cases according to cigarette consumption habit. It is observed that 59.7% cases did not consume cigarette but 40.3% consumed it. Whereas 79% controls did not consume cigarette but 21% consumed it. Those who consumed cigarette only were found to be associated with oesophageal cancer (OR 2.55). The association was found statistically significant ($\chi^2=5.46$, df=1, $P<0.05$).

Table 3 represents distribution of controls and cases by bidi smoking habit. It is observed that 71% cases did not consume bidi but 29% consumed it. Whereas 87% controls did not consume bidi but 12.9% consumed it. Those who consumed bidi only were found to be associated with higher risk of oesophageal cancer (OR 2.76). The association was statistically found significant ($\chi^2=4.86$, df=1, $P<0.05$).

Table 4 shows distribution of controls and cases according to number of cigarette and/or bidi consumption per day. In this study 30.6% cases did not consume bidi and/or cigarette but 22.6% cases consumed less than 10 per day and 46.8% consumed 10 or more than 10 per day. Whereas 66.1% controls did not consume bidi and/or cigarette but 16.1% consumed it less than 10 per day and 17.8% consumed 10 or more than 10 per day. Those who consumed less than 10 cigarette and/or bidi per day were found to be associated with high-risk of oesophageal cancer (OR 3.02) and those who consumed 10 or more than 10 cigarette and/or bidi were found to carry higher risk (OR 5.69) in comparison to non-smoker. More the number of bidi and/or cigarette smoke per day, higher the risk of developing oesophageal cancer. The association was found highly significant ($\chi^2=16.82$, df=2, $P<0.001$).

Table 5 shows distribution of controls and cases according to history of duration of smoking (Bidi and/or cigarette). Study shows 30.6% cases did not consume bidi and/or cigarette but 22.6% consumed for less than 10 years, 29% consumed 10-20 years and 17.8% consumed for 20 years or more. Whereas 66.1% controls did not consume bidi and/or cigarette but 17.7% consumed for less than 10 years, 11.4% consumed for 10-20 years and 4.8% controls consumed for 20 years or more. Those who smoked for less than 10 years were found to be associated with higher risk of oesophageal cancer (OR 2.75), for 10-20 years of smoking (OR 5.55) and for 20 years or more (OR 7.91). More the duration of smoking, higher the risk of developing oesophageal cancer. The association was found statistically highly significant ($X^2=17.84$, $df=3$, $P<0.001$).

Alcohol consumption is not a rare habit in this part of the country. Region wise, different local preparations are available at a cheap rate. Some of the socio-economically poor people often consume this product. Regularity depends on their financial position and various other factors. Table 6-8 represents various alcohol consumption habits of controls and cases.

Table 6 shows alcohol consumption habit wise distribution of controls and cases. In this study 61.3% cases did not consume alcohol but 38.7% consumed it. Whereas 83.9% controls did not consume alcohol but 16.1% consumed it. Those who consumed alcohol were found to be associated with higher risk of oesophageal cancer (OR 3.29). The association was found statistically significant ($X^2=7.94$, $df=1$, $P<0.01$).

Table 7 shows distribution of controls and cases according to number of times alcohol consumption per week. Study results shows that 61.3% cases did not consume alcohol, 12.9% consumed less than 3 times per week and 25.8% consumed 3 times or more per week. Whereas, 83.9% controls did not consume alcohol, 6.4% consumed less than 3 times per week and 9.7% controls consumed 3 times or more per week. The association between number of times alcohol consumption per week and oesophageal cancer was found statistically significant ($X^2=8.06$, $df=2$, $P<0.05$).

Table 8 represents distribution of controls and cases according to history of duration of alcohol consumption. In this study, 61.3% cases did not consume alcohol, 3.2% consumed for less than 10 years, 6.5% consumed for 10-20 years and 29% consumed for 20 years or more. Whereas 83.9% controls did not consume alcohol, 3.2% consumed for less than 10 years, 3.2 % consumed for 10-20 years and 9.7% consumed for 20 years or more. Alcohol consumption often goes hand in hand with smoking and increases the harmful effects to the individual due to a synergistic action. It is postulated that alcohol might act as a solvent facilitating the passage of carcinogens into the inner layers of the oesophagus.

Table 9 shows distribution of controls and cases according to alcohol consumption and tobacco smoking habit (both). In this study, 17.7% cases neither consumed alcohol nor smoked tobacco, 43.6% cases smoked tobacco but not consumed alcohol, 12.9% consumed alcohol but not smoked tobacco and 25.8% cases consumed alcohol and smoked tobacco. Whereas 59.7% controls neither smoked nor consumed alcohol, 24.2% controls smoked tobacco but not consumed alcohol, 6.4% consumed alcohol but did not smoke and 9.7% consumed alcohol and smoked tobacco also. The association between smoking only, alcohol consumption only and consumption of both and carcinoma oesophagus were found statistically highly significant ($X^2=23.38$, $df=3$, $P<0.001$).

Betel nut consumption is a common habit in this part of the country. This is a social tradition to offer betel nut to the guests. The habit started often since childhood. Betel nut is often consumed in various forms and with other ingredients like lime, tobacco, etc. Considering the widespread betel nut consumption habit in this region, detailed investigations had been undertaken. All these are represented in table 10-15.

Table 10 shows distribution of controls and cases by betel nut consumption habit. The study result shows 9.7% cases did not consume betel nut, but 90.3% cases consumed it. Whereas 29% controls did not consume but 71% consumed it. Those who consumed betel nut were found to be associated with higher risk of oesophageal cancer (OR 3.82). The association was found statistically significant ($X^2=7.44$, $df=1$, $P<0.01$).

Table 11 shows distribution of controls and cases according to number of times betel nut consumption per day. In this study 9.7% cases did not consume betel nut but 17.7% consumed less than 5 per day and 72.6% cases consumed 5 or more per day. Whereas 29% controls did not consume betel nut but 25.8% consumed less than 5 per day and 45.8% consumed 5 or more per day. Those who consumed betel nut less than 5 per day were associated with about 2 times higher risk of oesophageal cancer (OR 2.06) and those who consumed 5 or more per day were found to be associated with more than 4 times higher risk (OR 4.82). The association was statistically found highly significant ($X^2=10.88$, $df=2$, $P<0.01$).

Table 12 shows distribution of controls and cases according to history of duration of betel nut consumption. In this study 9.7% cases did not consume betel nut but 6.4% consumed for less than 10 years, 9.7% consumed 10-20 years and 74.2% consumed 20 years or more. On the other hand, 29% controls did not consume betel nut but 9.7% consumed for less than 10 years, 8.1% consumed 10-20 years and 53.2% consumed for 20 years or more. The duration of betel nut consumption habit was found to be associated with higher risk of oesophageal cancer. The association was statistically significant ($X^2=8.24$, $df=3$, $P<0.05$).

Table 13 shows distribution of controls and cases according to betel nut consumption alone, with lime and with lime and tobacco. Study shows 9.7% cases did not consume betel nut but 17.7% consumed betel nut alone, 45.2% consumed betel nut with lime and 27.4% consumed betel nut with lime and tobacco. Whereas 29% controls did not consume betel nut but 24.2% consumed betel nut alone, 33.9% consumed betel nut with lime and 12.9% consumed betel nut with lime and tobacco. Those who consumed betel nut alone were found to carry 2 times higher risk of oesophageal cancer (OR 2.20). Those who consumed betel nut with lime were found to carry 4 times higher risk of oesophageal cancer (OR 4.00) and those who consumed betel nut with lime and tobacco were found to carry about 6 times higher risk (OR 6.38). The association was statistically significant ($X^2=10.86$, $df=3$, $P<0.05$).

Table 14 shows distribution of controls and cases according to spitting habit during betel nut consumption. In this study 9.7% cases did not consume betel nut, 54.4% cases spitted during consumption and 33.9% did not spit during betel nut consumption. Whereas 29% controls did not consume betel nut but 51.6% spitted during consumption and 19.4% did not spit. Those who spitted during betel nut consumption were found to carry higher risk of oesophageal cancer (OR 3.28) and those who did not spit during betel nut consumption were found to carry more than 5 times higher risk (OR 5.25). The association was found statistically significant ($X^2=8.6$, $df=2$, $P<0.05$).

Table 15 shows distribution of controls and cases according to tobacco smoking and betel nut consumption habit. It has been observed that 6.5% cases were non-smoker and betel non chewers, 24.2% were non-smoker but betel chewers, 3.2% were smoker but non betel chewers and 66.1% cases were both smokers and betel chewers. Whereas 21% controls were non-smoker non betel chewers, 45.1% were non-smoker but betel chewers, 8.1% were smoker but non betel chewers and 25.8% were both smokers as well as betel chewers. The association between non-smoker betel chewers, smokers non betel chewers, smoker betel chewers and carcinoma oesophagus was statistically highly significant ($X^2=20.94$, $df=3$, $P<0.001$).

Tobacco chewing habit (Khoiny) is widely prevalent in our country. This habit is directly associated with oral cancer. The mixture of lime and tobacco kept in place in oral cavity for a long time. The contact area may undergo carcinogenic changes. But during keeping the mixture within the oral cavity little amount of the mixture may get swallowed and oesophagus may also get affected. Table 16-18 represents distribution of controls and cases according to various tobacco chewing (Khoiny) habits.

Table 16 shows distribution of controls and cases according to tobacco chewing habit (Khoiny). Study result shows that 40.3% cases did not chew tobacco but 59.7% chewed tobacco. Whereas 67.7% controls did not chew tobacco but 32.3% chewed tobacco. Those who chewed tobacco were found to be associated with higher risk of oesophageal cancer (OR 3.11). The association was statistically found significant ($X^2=9.40$, $df=1$, $P<0.01$).

Table 17 shows distribution of controls and cases according to

frequency of tobacco chewing habit (Khoiny). It is observed in this study that 40.3% cases did not chew tobacco but 22.6% chewed less than 5 times per day and 37.1% chewed 5 times or more per day. Whereas 67.7% controls did not chew tobacco, 14.5% chewed less than 5 times per day and 17.8% chewed 5 times or more per day. Those who chewed tobacco less than 5 times per day were found to be associated with higher risk of oesophageal cancer (OR 2.61) and those who chewed tobacco 5 times, or more were associated with higher risk of oesophageal cancer (OR 3.51). The association was also found statistically significant ($X^2=9.64$, $df=2$, $P<0.01$).

Table 18 shows distribution of controls and cases according to history of duration of tobacco chewing (Khoiny) habit. Study shows 40.3% cases did not chew tobacco, 6.5% chewed for less than 10 years, 17.7% chewed 10-20 years and 35.5% cases chewed for 20 years or more. Whereas, 67.7% controls did not chew tobacco, 4.8% chewed for less than 10 years, 9.7% chewed for 10-20 years and 17.8% chewed for 20 years or more. The association between duration of tobacco chewing and oesophageal cancer was found statistically significant ($X^2=9.60$, $df=3$, $P<0.05$).

CONCLUSION

In this study a strong relationship is established in between bidi and/or cigarette smoking and oesophageal cancer. Bidi smoking was found to carry little bit higher risk of oesophageal cancer than cigarette smoking. Smoking 10 or more than 10 cigarettes and/or bidi per day were found to carry higher risk than smoking less than 10 cigarettes and/or bidi per day. Similarly, smoking for 20 years or more were found to be associated with higher risk followed by 10-20 years.

Alcohol consumption was associated with higher risk of oesophageal cancer. Frequency of consumption of alcohol (≥ 3 times and < 3 times per week) and duration of alcohol consumption (≥ 20 years, 10-20 years and < 10 years) and consumption of alcohol and cigarette both were found to be associated with oesophageal cancer.

Betel nut consumption was found to be associated with higher risk of oesophageal cancer. Those who consumed 5 times or more per day were found to carry higher risk than those who consumed less than 5 times per day. Similarly, duration of consumption of betel nut were also found to be associated with carcinoma oesophagus. Those who consumed betel nut with lime and tobacco were found to carry higher risk than consumption of betel nut with lime and betel nut alone. Those who did not spit during betel nut consumption were found to carry higher risk than those who spitted during consumption. Smoking and betel nut consumption both, non-smoker betel chewers, smokers non betel chewers all were significantly associated with oesophageal cancer.

Tobacco chewing (Khoiny) was also found to be associated with higher risk of oesophageal cancer. Those who chewed tobacco 5 times or more per day were found to be associated with higher risk than those who chewed less than 5 times per day. Duration of tobacco chewing was also associated with carcinoma oesophagus.

Recommendations

To avoid and if not possible to reduce betel nut consumption, tobacco chewing, smoking and alcohol consumption habit.

Periodical health check-up with increasing age and following appearance of doubtful clinical features (difficulty in swallowing, hoarseness of voice and weight loss).

To increase Information Education and Communication (IEC) activities regarding ill effects of betel nut, tobacco, alcohol and about benefits of healthy dietary habits.

Acknowledgement

It is my pleasure to take this opportunity to express my respect and gratitude to Dr M.M. Deka, M.B.B.S., M.D., then Principal-cum-Chief Superintendent, Gauhati Medical College, Guwahati for allowing me to undertake this work.

I must express my profound sense of gratitude to my revered teacher Dr (Ms.) R. Sarma, MBBS (Gau), MD (BHU), then Professor in Department of Community Medicine, Gauhati Medical College, Guwahati for her guidance and valuable advice.

Samra, MBBS, MD, DPH, then Professor of Community Medicine, Gauhati Medical College, Guwahati for his valuable advice and suggestions.

Financial Support And Sponsorship: Nil.

Conflicts Of Interest: There are no conflicts of interest.

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I also take this opportunity to express my sincere gratitude to Dr N.N.