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## RESEARCH COMMUNICATION

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# Assessment of Awareness Level on Tobacco and Smoking Habits as Risk Factors for Cancer among Lung and Laryngeal Cancer Patients in Kolkata -A Case Control Study

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### Abstract

The burden of tobacco related cancers is increasing alarmingly throughout the world; therefore tobacco control merits the highest priority in the fight against cancer worldwide. The present report concerns a case control study of males with cancers of lung and larynx, to assess tobacco use, level of exposure and the awareness of risk of tobacco as a main cause of cancer. A total of 217 new patients with cancer of lung and larynx registered at Chittaranjan National Cancer Institute were recruited for the study, along with 200 healthy male (age, religion and residential status matched) visiting controls. Information on socio-demographic parameters, details of the disease, tobacco use, and awareness about effects of tobacco were obtained through a standardized questionnaire. Smokers were at a higher risk of disease than nonsmokers, with a direct correlation between duration and number of smoking, monthly income, family size and education level. Adjusted ORs observed for smokers for duration more than 40years of smoking and smoking more than 40beedi/ cigarettes per day were 4.3 and 3.9, respectively. Awareness level towards tobacco chewing, active and passive smoking revealed poor response among the subjects. Thus improved health education for antismoking and awareness generation of tobacco hazards should be strongly recommended as a preventive measure.

**Key Words:** case control study - lung and larynx cancers - tobacco habits - awareness - risk.

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### Introduction

Cancer of lung and larynx are the two major cancers among males all over the world which show direct correlations with tobacco smoking and chewing (IARC Monograph 1987;US Department of Health and Human services, 2004). Annually about 1.2 million people are being diagnosed with lung cancer throughout the world and associated is also exceedingly high (IARC Monograph, 2004). The tobacco related cancers reported by various Population Based Cancer Registries in India constitute 56.4% and 44.6 % of cancers in males and females respectively. Lung cancer among males shows a high incidence in almost all the population based registries of the country (NCRP:PBCR report ,2004a), the highest incidence being reported in Kolkata - ASR 18 (PBCR Kolkata , 2005). Cancer of larynx ranks third with ASR 6.1 in Kolkata PBCR, the highest incidence being reported by the Delhi PBCR (NCRP Atlas report 2004). Assessed in

any manner, tobacco use is one of the most alarming global health problems and an important risk factor for cancer. In addition to the active tobacco use, exposure to secondary tobacco smoke has also been proved to be carcinogenic (IARC Monograph, 2004). In India, beedi smoking and oral use of smokeless tobacco are widely prevalent, along with cigarette smoking, and are equally important risk factors (Ministry of Health and Family Welfare, Govt. of India CDC USA, WHO 2004). Currently smoking is considered to be a social issue, and governments of many countries are taking measures against this habit. India's tobacco problem is more complex than probably any other country in the world due to the burden of tobacco related disease and death (Gupta ,1988). Thus prevention and control of cancer necessitates reduction of exposure to the causes, and tobacco elimination alone would reduce a great number of cancer death particularly due to lung cancer (WHO , 2002).

The present study from Kolkata reports a hospital based case control study among males with lung and laryngeal

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cancers in relation to their tobacco habits, potential risk and their awareness towards the danger of tobacco use. Previous studies have investigated the risk factors of both these cancers in different parts of India (Sankarnarayanan et al,1990; Dikshit, 2000; Gupta, 2001). Not much information is available from the eastern part of our country. Thus, assessment of the tobacco habits and the awareness level among the community are of prime importance which are likely to yield clues for making health policies regarding tobacco control and prevention of tobacco related cancers.

## Material and Methods

**Patients:** A total of 217 newly diagnosed and microscopically confirmed male patients with cancers of lung and larynx attending the Surgical Oncology and ENT departments of Chittaranjan National Cancer Institute, were recruited for the study during the period between June 2001-June 2004 (see Table 1).

**Controls:** 200 healthy males without any history of malignancies who were accompanying patients to the hospital were selected as visiting controls. Controls were frequency matched to the cases for age, religion and area of residence and were recruited in the same time period.

**Questionnaire :** All patients and controls were subjected to a validated questionnaire with information on various socio-demographic data, disease details (primary site, morphology, method of diagnosis, extent of disease) (see Table 2) for the cases, tobacco habits, their attitudes and opinions regarding tobacco as a risk factor of cancer.

**Table 1. Frequencies of Cases and Controls as the Socio-demographic Factors**

	Criteria	No. of Cases /Controls	X	P value
Area of Residence	Rural	122/117	0.2209	NS*
	Urban	95/83		
Age Group	>44	31/28	0.2057	NS
	44-54	64/63		
	55-64	71/64		
	65+	51/45		
Religion	Hindu	191/183		
	Muslim	26/17		
Family Size	Small #	77/126	33.4002	<0.05
	Large	140/74		
Monthly Income	<1000	67/14	113.9862	<0.05
	1000-1999	78/29		
	2000-4999	42/34		
	5000+	30/123		
No. of Years of Schooling	< 4	49/10	101.71	<0.05
	4-7	37/13		
	8-12	86/39		
	12+	45/138		
Residential Status	Without Toilet	96/34	35.9918	<0.05
	With Toilet	121/166		

\*Non significant # No. of family members <=4

Smokers were also asked about the factors which influenced their smoking habits.

**Data Management and Analysis :** A visual review of each questionnaire was performed to detect any missing value or error in the data before duplicated data entry using a Visual Foxpro database programme. Odds Ratios (ORs) and 95% Confidence Intervals (CIs) were calculated to compare the nonsmokers and different groups of smokers with the incidence of the disease.

## Results

Socio-demographic factors of cases and controls are shown in Table 1. The incidence of disease was significantly higher among the lower income group (<2000) as compared to the higher income group (>5000). Similarly larger family size and residential status without toilet and running water facilities correlate with high incidence of the disease. Table 2 depicts the disease details of the cases. The smoking habits and the comparative risk of the exposed group have been represented in the Table 3. Duration of smoking was the strongest determinant of lung and laryngeal cancers among smokers. Hence, the earlier the age of start and the longer the continuation, the greater is the risk. It is also linked directly to the number of cigarettes smoked. Thus the smokers smoking for more than 40 years, with number of smoke per day amounting to 40 and above are more exposed to the disease (OR-6.34, CI-2.90-13.86) than the smokers with a lesser number of smoke and for a shorter period. Table 4, shows the correlation of the incidence of the disease with the smoking habits adjusted with the monthly income, number years of schooling and family size.

The awareness level towards the ill effects of tobacco chewing and smoking has been reflected in the Tables 5-10. About 20% of the cases and control had no idea about the adverse effects of tobacco use. 75% of the patients and controls were aware about the risk of smoking. Only 12% of the cases and control knew the risk of tobacco chewing. Maximum number of patients (77%) were aware only after

**Table 2. Disease Details for the Cases**

	Criteria	No. of Cases (#)	Percentage (%)
Primary Site *	Larynx(C32)	94	43.32
	Lung (C34)	123	56.68
Method of Diagnosis	Histology	58	26.73
	Cytology	148	68.20
	Histology& Cytology	11	5.07
Morphology (C32) (C34)	Sq.cell ca	94	43.32
	Sq.cell ca	63	29.04
	Adenoca	19	8.75
	Non small cell ca	33	15.21
	Small cell ca	8	3.68
Extent of Disease	Localized	126	58.06
	Metastatic	91	41.94

\*ICD-10

**Table 3. Frequency Distributions of Cases & Controls for Smoking Habits**

	Criteria	No. of Cases /Controls	OR	95% CI
Smoking Pattern	Nonsmokers	23/40	1.00	—
	Smokers	194/160	2.11	1.21-3.67
No. of Years of Smoking	Nonsmokers	23/40	1.00	—
	1-10	3/11	0.47	0.12-1.88
	11-20	20-42	0.83	0.40-1.73
	21-30	42/49	1.49	0.77-2.88
	31-40	67/39	2.99	1.56-5.71
	40+	62/19	5.68	2.75-11.73
No. of Smokes per Day	Nonsmokers	23/40	1.00	—
	1-5	5/12	0.72	0.23-2.32
	6-10	11/43	0.44	0.19-1.03
	11-20	57/58	1.71	0.91-3.21
	21-30	46-123	3.48	1.70-7.12
	31-40	24/10	4.17	1.70-10.25
	40+	51/14	6.34	2.90-13.86

**Table 4. Adjusted OR and 95% CI for the Smoking Habit, Duration & No. of Smokes per day adjusted to Monthly Income, No. of Years of Education and, Family Size**

	Criteria	OR	95% CI
Smoking Habits	Nonsmokers	1.00	—
	Smokers	1.75	0.89-3.44
No. of Years of Smoking	Nonsmokers	1.00	—
	1-10	0.34	0.05-2.33
	11-20	0.68	0.27-1.66
	21-30	1.42	0.66-3.07
	31-40	2.39	1.10-5.23
	40+	4.27	1.60-11.39
No. of Smokes per day	Nonsmokers	1.00	—
	1-5	1.02	0.28-3.76
	6-10	0.55	0.21-1.46
	11-20	1.42	0.62-3.26
	21-30	2.40	1.02-5.02
	31-40	4.39	1.36-14.14
	40+	3.85	1.61-9.25

**Table 5. Distribution of Cases and Controls according to Awareness about Tobacco as a Risk Factor of Cancer**

Risk Factor	Cases		Controls	
	#	%	#	%
Tobacco smoking	141	64.98	144	72.00
Tobacco chewing	4	1.84	2	1.00
Smoking& chewing	25	11.52	14	7.00
No idea	27	12.44	33	16.50
Not a risk factor	20	9.22	7	3.50
Total	217	100.00	200	100.00

diagnosis of the disease and 45% of them quit tobacco use. The main source of the awareness was the doctors /nurses treating the patients. Smoking habit was influenced by more than one factor mainly friends and occupation in 80% of the cases and 55% of the controls. Regarding the tobacco control measures 79% of the controls and 51% of the cases were in

**Table 6. Frequencies of Cases according to the Time of Realization about the Dangers of tobacco, Source of Awareness and Attitude after Diagnosis.**

	Criteria	No. of Cases(#)	Percentage (%)
Time	After diagnosis	167	76.96
	Before diagnosis	50	23.04
Source	Doctors/Nurses	94	43.32
	Family	5	2.30
	Media	13	5.99
	More than one	66	30.41
	No answer	39	17.98
Attitude after Diagnosis	Continue	44	20.28
	Irregular	65	29.95
	Quit	99	45.62
	No answer	9	4.15

**Table 7. Frequencies of Cases and Controls according to Influencing Factor behind Smoking**

Influencing Factor	Cases		Controls	
	#	%	#	%
Nonsmoker	23	10.60	40	20.00
Smoker				
Family/friends	11	5.06	17	8.50
Occupation	5	2.33	0	0.00
Physical & mental strain	0	0.00	20	10.00
More than one	174	80.18	110	55.00
No answer	4	1.83	13	6.50
Total	217	100.00	200	100.00

**Table 8. Distribution of Cases and Controls according to Awareness about Passive Smoking**

Criteria	Cases		Controls	
	#	%	#	%
No	171	78.81	72	36.00
Yes	39	17.97	112	56.00
No idea	7	3.22	16	8.00
Total	217	100.00	200	100.00

**Table 9. Distribution of Cases & Controls according to the Opinion about Tobacco Control**

	Criteria	Cases		Control	
		#	%	#	%
Increasing Public Awareness	No	19	9.00	2	1.00
	Yes	110	51.00	158	79.00
	No idea	88	40.00	40	20.00
Stop Selling Tobacco Products	No	14	6.45	67	33.50
	Yes	24	11.06	47	23.50
	No idea	179	82.49	86	43.00
Implementation of Law Prohibiting Tobacco Use	No	10	4.62	36	18.00
	Yes	78	35.94	86	43.00
	No idea	129	59.44	78	39.00

**Table 10. Effect of Education & Monthly Income on Awareness Level among the Subjects**

No. of Schooling Years	Only smoking		Only chewing		Smoking& chewing		No awareness	
	#	%	#	%	#	%	#	%
<4	28	6.70	0	0.00	3	0.72	13	3.11
4-7	82	19.66	3	0.72	18	4.31	44	10.55
8-12	57	13.66	2	0.50	3	0.72	17	4.10
12+	118	28.30	1	0.24	15	3.60	13	3.11
Monthly Income	Only smoking		Only chewing		Smoking& chewing		No awareness	
	#	%	#	%	#	%	#	%
<500	5	1.23	0	0.00	0	0.00	5	1.20
500-999	42	10.12	1	0.24	8	1.92	20	4.80
1000-1999	63	15.25	0	0.00	11	2.70	33	7.20
2000-4999	55	13.30	3	0.72	5	1.20	13	3.11
5000+	120	28.80	2	0.50	15	3.60	16	3.90

favour of increased public awareness. 43% of the control and 36% of the case expressed positive attitude towards implementation of laws prohibiting tobacco use. Only 11% of the cases and 23% of the controls were of opinion that sale of tobacco products should be stopped. Regarding passive smoking, 79% of the cases had no idea about the risk of passive smoking. 56% of the control were aware about its consequences. Awareness level showed a direct correlation with the levels of education and monthly income among all the subjects

## Discussion

Tobacco use specially smoking in the form of beedi and cigarettes have been established as risk factors for the cancer of lung and larynx in different countries of the world (Thyng et al,1988; Pandey et al,1999; Walley et al, 2001). In India several case control studies have investigated the association of tobacco use with the high incidence and mortality of the disease (Sankarnarayanan et al,1990; Dikshit and Kanhere, 2000; Gupta et al, 2001). Tobacco smoking increases all the histological types of lung cancer specially squamous cell carcinoma and adenocarcinoma ( Bofetta, 1999). Cessation of smoking at any age prevents further increase in risk of lung and laryngeal cancers incurred by continuous smoking. The younger the age of cessation, the greater the benefit (US department of Health and Human Services,2004). Passive smoking is involuntary exposure to tobacco smoke. The secondhand smoke exhaled by smokers and smoke directly released from smouldering tobacco contains nicotine and other carcinogens (IARC monograph, 2004). Exposure to environmental tobacco smoke has been associated with increased risk of lung cancer in epidemiological studies (Hackshaw et al,1997; Pandey et al,1999; Sandler et al, 1985), although the risk is smaller than the active smoking.

In the present study, attempts have been made to assess the level of awareness among the common people regarding the hazards of tobacco use, both active and passive smoking as risk factors of cancer along with the assessment of the relative risks of the smokers compared with the nonsmokers adjusted to their smoking habits and various socioeconomic

conditions. The data supports the previous findings that smokers had a greater chance of cancer than the nonsmokers, and that too was correlated to the duration and number of smoke. Socioeconomic factors play a prominent role in the smoking habits. Among smokers with a low monthly income, with a large family and with a low literacy level the incidence of the disease was higher than the smokers with a comparatively higher monthly income and literacy level, living in a smaller family. This may be accounted for their poor personal hygiene and health conditions. As shown in earlier studies, (Kitagawa et al, 2000) the difference in the lifestyle is very important for studying the effects of smoking and incidence and severity of the disease.

The role of general awareness is extremely important in cancer control and prevention A report by Yang et al (2001), showed that 72% of smokers had no intention to quit smoking and those who actually did quit, was because of illness. A similar trend is seen in the present study also. 45% of the patients quit smoking after the diagnosis of cancer, as 76% of cases became aware only after their diagnosis through medical personnels. Smoking habit was mainly influenced by friends and relatives, to some extent by gender and occupation. Previous reports by Sen and Basu (2001), showed that the determinants of initiation of smoking in India are friends and relatives with similar habits. A poor awareness level regarding risk of tobacco chewing is revealed through this study. This may be due to lesser chewing habits among the people of West Bengal (Sen, 2002). The pattern may be different in the younger age group at present due to more addiction to gutka and khaini which needs further investigations. Regarding passive smoking as a risk factor of cancer the awareness level is extremely poor, keeping in mind that 80% of the total population of West Bengal are smokers. Only 56% among the controls were aware about the dangers of passive smoking. Several surveys among the school personnels in different parts of India shows that smoking is highly prevalent among them (Sinha et al, 2002). Similar study in West Bengal revealed that most of the school personnels were highly supportive on tobacco control issues through regular tobacco control training (Sinha and Roychowdhury, 2004). Regarding control of tobacco

use, maximum number of subjects voted for the increasing public awareness through various ways. The second category opted for banning tobacco use in public places. The smokers on the other hand opined for a restricted smoking area.

Tobacco smoking is one of the greatest health problems because it becomes the biggest single risk factor for ill health (Walley et al, 2001), and accounts for 12% of the total mortality and is the greatest risk factor for cancer of lung (World Health Organization, 2002). Thus prevention of tobacco use through health education should receive the highest priority among all communities especially among the youth. It is hoped that the social changes brought about by education will make youth to dislike smoking. These findings therefore have important implications for public health efforts to reduce tobacco use through various anti smoking actions, formulations and implementations of laws in the society.

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## References

- Bofetta P & 26 others (1998). Multicentric case control study of exposure to environmental tobacco smoke and lung cancer in Europe. *Europe J Natl Cancer Inst*, **90**, 1440-50.
- Bofetta P, Ahrens W, Nyberg F, et al (1999). Exposure to environmental tobacco smoke a risk of adenocarcinoma of lung. *Int J Cancer*, **83**, 635-9.
- Dikshit RP, Kanhere S, (2000). Tobacco habits and risk of lung cancer, oropharyngeal and oral cavity cancer: A population based case control study in Bhopal, India. *Int J Cancer*, **29**, 609-14.
- Gupta D, Bofetta P, Gaborieau V, et al (2001). Risk factor of lung cancer in Chandigarh, India. *Indian J Med Res*, **113**, 142-50.
- Gupta PC (1988). Health consequences of tobacco use in India. *World Smoking & Health*, **13**, 5-10.
- Hackshaw AK, Law MR, Wald NJ (1997). The accumulated evidence on lung cancer and environmental tobacco smoke. *Brit Med J*, **315**, 980-8.
- International agency for research on cancer (IARC) (1987). IARC monographs on the evaluation of carcinogenic risks to humans, Supplement 7, Overall evaluation of carcinogenicity; An updating of IARC monographs Lyon IARC Press Vol 1-42, 357-61
- International Agency for Research on Cancer (IARC) (2004a). IARC monographs on evaluation of carcinogenic risk of chemicals to humans: Tobacco smoke and involuntary smoking, Lyon IARC Press Vol 83.
- Kitagawa Y, Nakaji S, Shimoyama T, et al (2000). Differences in lifestyle of a smoking and a nonsmoking population in Japan. *Asian Pacific J Cancer Prev*, **1**, 293-8.
- Ministry of Health and Family welfare, Govt. of India, Centre for Disease Control and prevention, USA World health Organization (2004) Report on Tobacco control in India. Eds. Reddy KS, Gupta PC.
- National Cancer Registry Programme (NCRP) (2004a). Two year report by the population based cancer registries 1997-98, Bangalore, Indian Council of Medical Research Coordinating Unit.
- Pandey M, Mathew A, Nair MK (1999). Global perspective of tobacco habits lung cancer a lesion for third world countries. *Eur J Cancer Prev*, **8**, 271-9.
- Population Based Cancer Registry Kolkata (2005). A Report of Kolkata PBCR 1997-2001. Chittaranjan National Cancer Institute. Kolkata.
- Sandler DP, Wilcox AJ, Everson RB (1985a). Passive smoking in adulthood and cancer risk. *Am J Epidemiology*, **121**, 37-48.
- Sandler DP, Wilcox AJ, Everson RB (1985b). Cumulative effects of lifetime passive smoking on cancer risk. *Lancet*, **121**, 312-5.
- Sankarnarayanan R, Duffy SW, Nair MK, et al (1990). Tobacco and alcohol as risk factors in cancer of the larynx in Kerala. India. *Int J Cancer*, **45**, 879-82.
- Sen U, Basu A, (2001). Factors influencing behaviour among adolescents. *Asian Pacific J Cancer Prev*, **1**, 305-9.
- Sen U (2002). Tobacco use in Kolkata. *Lifeline WHO-SEARO Newsletter*, **8**, 7-9.
- Sinha DN, Gupta PC, Pednekar MS, et al (2002). Tobacco use among school personnels in Bihar, India. *Tobacco Control*, **11**, 82-5.
- Sinha DN, Roychowdhury S (2004). Tobacco control practices in 25 school of West Bengal. *Indian J Public Health*, **48**, 128-31.
- Thyng AJ, Estene J, Raymond L, et al (1998). Cancer of the larynx/hypopharynx tobacco and alcohol. *Int J Cancer*, **41**, 483-91.
- US Department of health and human Services (2004). The health consequences of smoking: A report of the surgeon general Atlanta.
- Walley J, Wright J, Hubley J (2001). Public Health, Oxford University Press, Oxford.
- World Health Organization (2002). National Cancer Control Programmes, Policies and Managarial Guidelines, WHO, Geneva.
- Yang G, Ma J, Chen A, et al (2001). smoking cessation in China: finding from the 1996 prevalence study. *Tobacco Control*, **10**, 170-7.