RESEARCH ARTICLE

Score Based Risk Assessment of Lung Cancer and its Evaluation for Bangladeshi People

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Abstract

Background: The problem of cancer, especially lung cancer, is very acute in Bangladesh. The present study was conducted to evaluate the risk of lung cancer among Bangladeshi people based on hereditary, socio-economic and demographic factors. Materials and Methods: This study was carried out in 208 people (patients-104, controls-104) from January 2012 to September 2013 using a structured questionnaire containing details of lung cancer risk factors including smoking, secondhand smoke, tobacco leaf intake, age, gender, family history, chronic lung diseases, radiotherapy in the chest area, diet, obesity, physical activity, alcohol consumption, occupation, education, and income. Descriptive statistics and testing of hypotheses were used for the analysis using SPSS software (version 20). Results: According to this study, lung cancer was more prevalent in males than females. Smoking was the highest risk factor (OR=9.707; RR=3.924; sensitivity=0.8872 and P<0.0001) followed by previous lung disease (asthma, tuberculosis etc.) (OR=7.095; RR=1.508; sensitivity=0.316 and P<0.0001)) for male patients. Highly cooked food (OR=2.485; RR=1.126; sensitivity=0.418 and P=0.004)) and also genetic inheritance (OR=1.93; RR=1.335; sensitivity=0.163 and P=0.138) demonstrated significant correlation with lung cancer as risk factors after these two and alcohol consumption was not prevalent. On the other hand, for female patients, tobacco leaf intake represented the highest risk (OR=2.00; RR=1.429; sensitivity= 0.667 and P=0.5603) while genetic inheritance and highly cooked food also correlate with lung cancer but not so significantly. Socio-economic status and education level also play important roles in causing lung cancer. Some 78.5% male and 83.3% of female cancer patients were rural residents, while 58.2% lived at the margin or below the poverty line. Most male (39.8%) and female (50.0%) patients had completed only primary level education, and 27.6% male and 33.3% female patients were illiterate. Smoking was found to be more prevalent among the less educated persons. Conclusions: The results obtained in this study indicate the importance of creating awareness about lung cancer risk factors among Bangladeshi people and making appropriate access to health services for the illiterate, poor, rural people.

Keywords: Lung cancer - risk assessment - smoking - genetic factor - socio-demographics - awareness - Bangladesh

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Introduction

According to the World Health Organisation, cancer is the leading cause of death worldwide as it accounted for 7.4 million deaths (around 13% of all deaths) in 2004 and lung cancer is among the five main types of cancer leading to overall cancer mortality contributing about 1.3 million deaths per year globally.

Lung cancer was the most frequent malignant disease and also the most common cause of death from cancer, with 1.38 million deaths (18.2% of the total) by 2008 in the world (Ferlay et al., 2010) and almost half (49.9%) of the lung cancer cases occur in the developing countries (Siegel et al., 2013). Unfortunately no reliable statistical data about cancer are available for most developing countries and particularly in Bangladesh. In the light of the statistics available from the World Health Organisation, cancer incidence, prevelence and mortality can be estimated approximately as 2,00,000, 8,00,000 and 1,50,000 respectively for the 130 million people of Bangladesh. Based on the World Health Statistics, new cancer cases in Bangladesh have been estimated at 167 per 1,00,000 population. Based on the data available from the Radiotherapy Department of the Dhaka Medical College and Hospital, 21% male in our country suffer from lung cancer. Illiteracy, inadequate knowledge about health, poverty, chronic infection, and malnutrition are continuously adding additional threat on the huge burden

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of cancers in Bangladesh. Lung cancer is the leading cancer among males and third most common cancer among females in Bangladesh (Islam et al 2012; Sarker et al., 2012).

According to the International Agency for Research on Cancer (IARC) and Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, USA, smoking and secondhand smoke, various exposures at home and work, family history, radiation therapy to the chest can cause lung cancer. Smoking and tobacco use cause 90% of all lung cancer deaths worldwide (Wingo et al., 1999; Thun et al., 2012). A causal association has been established between exposure to environmental carcinogens and lung cancer and a number of workplace exposures have been classified as causes of lung cancer by IARC (Cogliano et al., 2011) which includes exposure to radon, asbestos, silica dust, TCDD, welding fumes, arsenic etc. It has been estimated that in the UK, around 21% of lung cancers in men and around 4% in women are linked to occupational exposures (Rushton et al., 2012). In several Asian populations, an increased risk of lung cancer is present in women from indoor pollution from cooking and heating (Paolo et al., 2003). It is estimated that radiotherapy treatment for a previous cancer is associated with around 320 cases of lung cancer in the UK each year (Parkin and Darby, 2011). Family history of lung cancer in a first-degree relative was associated with a 51% increased risk of lung cancer, independent of smoking and other relevant factors and the effect is stronger when the affected relative is a sibling (82% risk increase) rather than a parent (25-37% risk increase) (Cote et al., 2012). History of pneumonia can be associated with 36% increased lung cancer risk in never-smokers, and a 43% increase in ever- and never-smokers combined and people with a previous diagnosis of tuberculosis (TB) have around double the lung cancer risk (Brenner et al., 2011). People with asthma have a higher risk of being diagnosed with lung cancer in the two years following their asthma diagnosis (Rosenberger et al., 2012). There is limited-suggestive evidence that red meat, processed meat, total fat, butter and retinol (vitamin A) supplements (in smokers only), may increase the risk of lung cancer and limited evidence that non-starchy vegetables, selenium in foods (e.g. nuts, cereals and meat) or supplements, and foods containing quercetin may protect against lung cancer and there is probable evidence that fruit (particularly fruit containing carotenoids) protects against lung cancer (WCRF/AICR, 2007). A diet rich in fresh vegetables and cheese seems to be protective (Kreuzer et al., 2002). Higher levels of physical activity are associated with 20-40% reductions in lung cancer risk and the effect is stronger in smokers than non-smokers (Friedenreich et al., 2010).

Therefore the main objective of the present study was to carry out a statistical investigation for evaluation of the risk factors of lung cancer for Bangladeshi people and to understand the present condition of lung cancer patients in Bangladesh so that it may help to promote public awareness for prevention of lung cancer.

Materials and Methods

Study design and participants

The study was designed through extensive literature review from PubMed and from field survey. Because of the exploratory nature of the study, a cross-sectional, self-administered questionnaire-based survey was carried out. Patients' data were collected from the patients, who have histologically proven lung cancer, from the National Cancer Research Institute and Hospital (NICRH), Mohakhali, Dhaka and Dhaka Medical College and Hospital (DMCH), Dhaka and control samples were collected from population of different regions of Bangladesh.

Questionnaire design

Extensive review of literature, exploratory research and qualitative piloting informed the development and refinement of a structured questionnaire in English. The questionnaire was close and open ended including series of questions about the knowledge of known risk factors associated with lung cancer such as age, smoking status, passive smoking, tobacco leaf intake, hereditary factor, chronic lung disease, radiotherapy, diet, alcohol consumption, obesity, physical activity etc. The gender, educational level, income, living place and occupation were considered in the analysis to mediate the socio-demographic factors which had an influence on other risk factors.

Data collection

This study was carried out between 01 January 2012 and 31 September 2013. A total of 104 patient's data were collected, comprising 98 males (94.2%) and 6 females (5.8%) of the total study samples and 104 control groups (98 male and 6 female) were randomly selected from different areas of Bangladesh. Oral consent was taken from all subjects before data collection and the study subjects were requested to complete the provided questionnaires. The authors described the purpose and process of the survey to the people, gave instructions for completing the questionnaire, and emphasized the confidentiality and anonymity of the responses. The questionnaires were completed and collected under the supervision of the authors. Anthropometric data of control group were collected according to standard techniques (De Onis, 1996) and samples' data were collected from their medical report. In this study, body weight (W), height (H) was taken to calculate BMI (W/H^2). Age was estimated from birth certificates.

Data analysis

Collected data from sample and control were edited during and after collection, coded, classified, tabulated, and checked further for any missing information. The total risk factors and socio demographic data were analyzed with correspond to gender to evaluate the risk factors those are crucially responsible for lung cancer among male and female in Bangladesh. The data were analyzed using MS Excel spread sheet 2007, Statistical Package for the Social Sciences (SPSS) Version 20.0. The chi-square

test was used to examine the association and significance between different variables. A p-value of <0.05 was used to establish statistical significance. Odd ratio (at 95% confidence Interval) more than 2.00 represents the significant correlation with lung cancer and associated risk factor.

Results

In the 104 samples, the mean age of patient was 56.99±SD12.542 years, and mean BMI was 19.035± SD3.3925, where 98(94.2%) were male and 6(5.8%) were female. In the control group, we selected 104 individual (male 94.2% and female 5.8%) from different areas of Bangladesh. The mean age and BMI of control groups were respectively, age 48.27±SD 10.517 and BMI mean 21.8231± SD 2.9359. Total 88.78% (among male) of the study samples are smokers and rest of the sample groups smoke occasionally or not at all. No smoking patient was found among female patients. Table 1 shows the frequency distribution of study samples and controls. From Table 1, it is clearly seen that, smoking (for male) (87%, P <0.0001) and highly cooked food (p=0.222) are highly associated with lung cancer for Bangladeshi people. Tobacco leaf intake represents higher risk for female than male.

Table 2 represents the risk factors and their association with lung cancer for Bangladeshi people in corresponding with Odd ratio, Relative Risk, Sensitivity and P-value. This table reveals significant difference in smoking and alcohol prevalence amongst males and females. In our study sample 88.78% male patients are smoker and smoking belongs to highest risk factor (OR=9.707; RR=3.924; Sensitivity=0.8872 and P<0.0001) according to our statistical analysis. Then previous lung diseases (asthma, tuberculosis etc.) shows the second risk factor (OR=7.095; RR=1.508; Sensitivity=0.316 and P<0.0001)) for male patients. Highly cooked food (OR=2.485; RR=1.126; Sensitivity=0.418 and P=0.004)) and also Genetic inheritance (OR=1.93; RR=1.335; Sensitivity=0.163 and P=0.138) depict significant correlation with lung cancer as risk factors after smoking and previous lung diseases. Alcohol consumption is not so prevalent for Bangladeshi people. On the other hand, tobacco leaf intake represent the highest risk (OR=2.00; RR=1.429; Sensitivity= 0.667 and P=0.5603) for female patients. Genetic inheritance and highly cooked food also correlate with lung cancer of female patients but not so significant. In Bangladesh, lung cancer is more prevalence for male than female. Score based risk factor assessment of lung cancer for Bangladeshi people are shown in Figure 1.

According to statistical data analysis (based on Odd ratio and Relative Risk) we are able to find out risk factors and their scoring within male and female patients of lung cancer in Bangladesh. Figure 1 shows the rate of risk with based on scoring of relative risk. Score based arrangement of lung cancer risk factors for male: Smoking > Previous lung disease > Highly cooked food>Genetic inheritance>

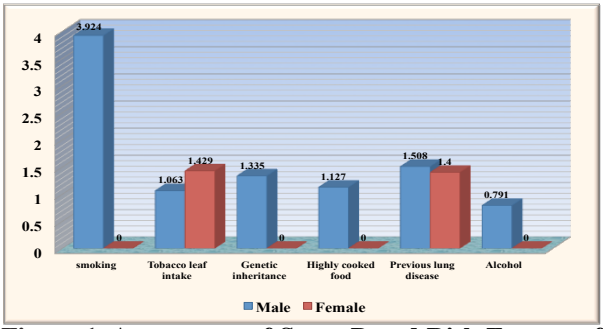

Figure 1. Assessment of Score Based Risk Factors of Lung Cancer for Bangladeshi People

Table 1. Frequency Distribution and Significant Variation of Risk Factors among Cancer Patients and Control Groups (*Statistically Significant)

Risk Factors	Patients (N=104)				Controls (N=104)				P value
	Male n=98, (94.2%)		Female n=6, (5.8%)		Male n =98, (94.2%)		Female n=6,(5.8%)		
	Yes	No	Yes	No	Yes	No	Yes	No	
Smoking	87 (88.78%)	11 (11.22%)	0	6 (100%)	44 (44.89%)	54 (55.11%)	0	6(100%)	<0.0001*
Tobacco leaf intake	47 (48.0%)	51 (52.0%)	4 (66.7%)	2 (33.33%)	44 (44.9%)	54 (55.1%)	3 (50.0%)	3 (50.0%)	0.375
Genetic inheritance	16 (16.32%)	82 (83.7%)	0	6 (100%)	9 (9.2%)	89 (90.8%)	1 (6.7%)	5 (83.3%)	0.561
Highly Cooked food	41 (41.8%)	57 (58.2%)	1 (16.7%)	5 (83.3%)	22 (22.4%)	76 (77.6%)	0	6(100%)	0.222*
	Daily	Not daily							
Previous lung disease (Asthma,TB)	31 (31.6%)	67 (68.4%)	3 (50%)	3 (50%)	6 (6.1%)	92 (93.9%)	2 (33.3%)	4 (66.7%)	0.352
Alcohol	4 (4.1%)	94 (95.9%)	0	6 (100%)	6 (6.1%)	92 (93.9%)	0	6 (00%)	0.881
	Daily				Daily				

Table 2. Assessment of Risk Factors of Lung Cancer with Odd ratio, Relative Risk and p value (At 95% CI, NaN=Not a number, *Statistically Significant)

Risk Factors	Odd Ratio		Relative Risk		Sensitivity		p value	
	Male	Female	Male	Female	Male	Female	Male	Female
Smoking	9.707	NaN	3.924	NaN	0.8872	0	<0.0001*	1
Tobacco Leaf intake	1.13	2	1.063	1.429	0.48	0.667	0.667	0.5603
Genetic inheritance	1.93	0	1.335	0	0.163	0	0.138	1
Cooked food Highly	2.485	NaN	1.127	NaN	0.418	0	0.004*	1
Previous lung disease (Asthma,Tb)	7.095	2	1.508	1.4	0.316	0.5	<0.0001*	0.558
Alcohol	0.652	NaN	0.791	NaN	0.041	0	0.518	1

Tobacco leaf intake>Alcohol consumption and for female: Tobacco leaf intake> Previous lung disease> Highly cooked food>Genetic inheritance.

The sensitivity and specificity of risk factors were analyzed through Receiver Operating Characteristic (ROC) curves (Figure 2). Each point on the ROC curve represents a sensitivity/specificity pair corresponding to our particular decision threshold value. The area under the ROC curve (AUC) is a measureable parameter that can distinguish between two diagnostic groups (diseased/ normal).This ROC curve depicts graph of sensitivity (y-axis) *vs* 1-specificity (x-axis). Maximizing sensitivity corresponds to some large y value on the ROC curve and maximizing specificity corresponds to a small x value on the ROC curve. As our study samples consist 94.2% male patients and larger values of the test result variable(s) indicate stronger evidence for a positive actual state so our positive actual is male. Due to the low number female samples statistical analysis become slightly biased. The smallest cutoff value is the minimum observed test (- 1), and the largest cutoff value is the maximum observed test value (+1). All the other cutoff values are the averages of two consecutive ordered observed test values. The test result variable(s): smoking, tobacco leaf intake, previous lung disease history; family member diagnosed with lung cancer has at least one tie between the positive actual state group and the negative actual state group. Area under the Curve (AUC) smoking (0.515); tobacco leaf intake (0.427); previous lung disease (0.595); genetic inheritance (0.4).

In further, the socio-demographic conditions of lung cancer were correlated with respect to annual income, residential area, occupation and their educational level. Most of the study samples (cancer patients) are from the rural area, 78.5% male and 83.3% female patients live in rural area and their work places are also in rural area. Maximum male lung cancer patients' occupations (45.9%) are related mostly with business and then with agriculture, in fact most of them are farmers (26.5%). On the other hand, most of the female patients (83.3%) are housewives. According to our study, 58.2% lung cancer patients are not solvent; most of them live in the margin or bellow the poverty line. So they are unable to afford for the early diagnosis of lung cancer and it's a matter of great regret that most of our study patients are in metastasis stage.

Table 5 describes the socio economic character of lung cancer patients in Bangladesh. In this study, we have found 32.7% patients belong to annual income of 100000 to 150000 tk range (USD 1288to 1932) and 25% people belong to annual income of USD 644-1288 range.

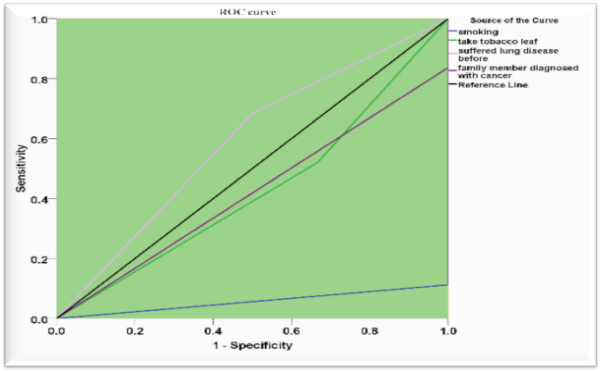

Figure 2. Complete Sensitivity and Specificity Report of Risk Factors of Lung Cancer by ROC Curve Analysis

Table 3. Correlation among Gender, residential Area and Work Place of Cancer Patients (Pearson Chi-square value 26.952 and df 1, *Statistically Significant)

Gender				Residential Area		Total	P-value
				Rural	Urban		
Male	Work Place	Rural	Count	62	3	65	
			% within workplace	96.90%	3.10%	100.00%	
			% within residential area	78.50%	11.10%	66.00%	
			% of Total	63.90%	2.10%	66.00%	
		Urban	Count	17	16	33	
			% within workplace	51.50%	48.50%	100.00%	
			% within residential area	21.50%	88.90%	34.00%	
			% of Total	17.50%	16.50%	34.00%	
	Total		Count	79	18	98	
			% within workplace	81.40%	18.60%	100.00%	
			% within residential area	100.00%	100.00%	100.00%	<0.0001*
			% of Total	81.40%	18.60%	100.00%	
Female	Workplace	Rural	Count	5		5	
			% within workplace	100.00%		100.00%	
			% within residential area	83.30%		83.30%	
			% of Total	83.30%		83.30%	
		Urban	Count	1		1	
			% within workplace	100.00%		100.00%	
			% within residential area	16.70%		16.70%	
			% of Total	16.70%		16.70%	
	Total		Count	6		6	
			% within workplace	100.00%		100.00%	<0.0001*
			% within residential area	100.00%		100.00%	
			% of Total	100.00%		100.00%	

Table 4. Correlation among Gender and Occupation of the Lung Cancer Patients (*statistically significant)

Gender			Occupation							Total	P-value
			Farmer	Business	Labor	Teacher	Job	housewife	student		
	Male	Count	26	45	11	3	11	0	2	98	
		% within gender	26.50%	45.90%	11.20%	3.10%	11.20%	0.00%	2.00%	100.00%	
		% within Occupation	100.00%	100.00%	100.00%	100.00%	100.00%	0.00%	66.70%	94.20%	
		% of Total	25.00%	43.30%	10.60%	2.90%	10.60%	0.00%	1.90%	94.20%	
	Female	Count	0	0	0	0	0	5	1	6	
		% within gender	0.00%	0.00%	0.00%	0.00%	0.00%	83.30%	16.70%	100.00%	<0.0001*
		% within Occupation	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	33.30%	5.80%	
		% of Total	0.00%	0.00%	0.00%	0.00%	0.00%	4.80%	1.00%	5.80%	
	Total	Count	26	45	11	3	11	5	3	104	
		% within gender	25.00%	43.30%	10.60%	2.90%	10.60%	4.80%	2.90%	100.00%	
		% within Occupation	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
		% of Total	25.00%	43.30%	10.60%	2.90%	10.60%	4.80%	2.90%	100.00%	

Table 5. Cross Tabulation of Gender and Annual Income of Cancer Patients (Pearson Chi-square value 55.220 and df 6, *statistically significant)

Gender		Annual income								P-value
		No income	50000-100000 tk	100000-150000 tk	150000-200000 tk	200000-250000 tk	250000-300000 tk	>300000 tk	Total	
Male	Count	1	25	32	16	13	5	6	98	
	% within gender	1.00%	25.50%	32.70%	16.30%	13.30%	5.10%	6.10%	100.00%	
	% within annual income	20.00%	92.60%	100.00%	100.00%	100.00%	100.00%	100.00%	94.20%	
	% of Total	1.00%	24.00%	30.80%	15.40%	12.50%	4.80%	5.80%	94.20%	
Female	Count	4	2	0	0	0	0	0	6	
	% within gender	66.70%	33.30%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	
	% within annual income	80.00%	7.40%	0.00%	0.00%	0.00%	0.00%	0.00%	5.80%	
	% of Total	3.80%	1.90%	0.00%	0.00%	0.00%	0.00%	0.00%	5.80%	
Total	Count	5	27	32	16	13	5	6	104	<0.0001*
	% within gender	4.80%	26.00%	30.80%	15.40%	12.50%	4.80%	5.80%	100.00%	
	% within annual income	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
	% of Total	4.80%	26.00%	30.80%	15.40%	12.50%	4.80%	5.80%	100.00%	

Table 6. Cross Tabulation within Gender and Education of Cancer Patients (Pearson Chi-square value 0.793 and df 3, at 95%CI)

Gender			Education				Total	P-value
			Primary	Secondary	Higher educated	Illiterate		
	Male	Count	39	26	6	27	98	
		% within gender	39.80%	26.50%	6.10%	27.60%	100.00%	
		% within education	92.90%	96.30%	100.00%	93.10%	94.20%	
		% of Total	37.50%	25.00%	5.80%	26.00%	94.20%	
	Female	Count	3	1	0	2	6	0.851
		% within gender	50.00%	16.70%	0.00%	33.30%	100.00%	
		% within education	7.10%	3.70%	0.00%	6.90%	5.80%	
		% of Total	2.90%	1.00%	0.00%	1.90%	5.80%	
Total		Count	42	27	6	29	104	
		% within gender	40.40%	26.00%	5.80%	27.90%	100.00%	
		% within education	100.00%	100.00%	100.00%	100.00%	100.00%	
		% of Total	40.40%	26.00%	5.80%	27.90%	100.00%	

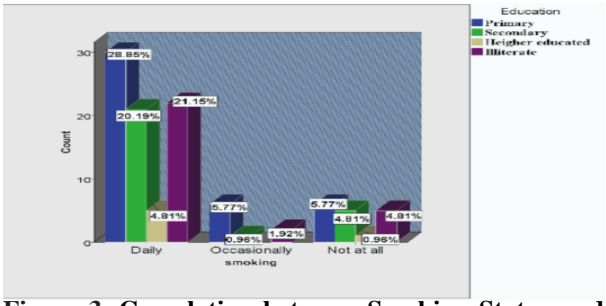

Figure 3. Correlation between Smoking Status and Educational Level of Lung Cancer Patients

So maximum percentage of lung cancer patients are poor and only 6% patients are rich (annual income more than 5795 USD) according to our study.

Table 6 indicates the educational status of cancer patients. Most of the male (39.8%) and female (50.0%) patients have completed only primary level education. Then 27.6% male and 33.3% female patients are illiterate and only 6.1% patients are higher educated. Significant relationship was also found between smoking and educational level of lung cancer patients in Bangladesh. Smoking was found to be more prevalent among the less

educated person. This relationship is shown in bar diagram (Figure 3). It was found that 28.85% daily smoker patients have completed primary level education and 21.5% daily smoker patients are illiterate. Only 4.81% higher educated patients are daily smoker (Figure 3).

Discussion

This study shows that lung cancer is more prevelant in male than female and this finding is similar to that were found in previous surveys conducted in Bangladesh. Literature revealed lung cancer as the leading cancer in male in our country (Talukder et al., 2008). In this study, we found out some risk factors and socio-economic, demographic conditions those are highly correlated with lung cancer for Bangladeshi people. We found risk factors those are comparatively higher in correlation with or responsible for lung cancer, are smoking, tobacco leaf intake, previous lung disease (asthma, tuberculosis etc.), genetic inheritance, highly cooked food consumption. It was found that the highest number of cancer patients were among 50-65 year age group which supports the hypothesis of risk of developing lung cancer increases with age (Moore et al., 2010).

Tobacco use, especially cigarette smoking, has been considered as the highest risk factor for lung cancer in different studies worldwide and our study also tells that smoking belongs to the highest risk factor for male and tobacco leaf intake for female for lung cancer incidents in Bangladeshi people, as in other countries of Asia (Ahmed et al., 2013; Kamsa-Ard et al., 2013; Luqman et al., 2014). Though no female patient was found as smoker in our study but females are prone to expose second hand smoke and indoor air pollution. Previous lung disease and genetic inheritance are associated with lung cancer both for male and female and these two factors have been considered as greater risk for lung cancer by IARC. Alcohol consumption has not been found so prevalent for lung cancer in Bangladeshi people, which supports the findings of some meta-analyses that have shown that alcohol intake is not associated with lung cancer risk in never-smokers or ever-smokers (Bagnardi et al., 2011; Chao, 2011).

In our study, smoking was found to be more prevalent in low educational level population , which is similar to the findings supported by other international comparison studies where smoking was found to be more prevalent among the less educated (Chawla et al., 2010; Aarts et al., 2013). Socio-econic factors are also important in Nepal (Hashibe et al., 2011). As cessation of smoking has been associated with a declining risk for lung cancer (Yano et al., 2011), therefore proper counselling, programs and policies to promote cessation and reduce smoking are to be provided by the public health workers and by the government.

World Cancer Research Fund/American Institute for Cancer Research tells that there is limited-suggestive evidence that red meat, processed meat, total fat etc. may increase the risk of lung cancer, but our study found a significant correlation between highly cooked food, for example, highly fried meat, grilled food, open flame cooked meat or fish, junk foods etc and lung cancer risk).

We found most of our lung cancer patients illiterate and poor rural people who are not conscious about their health due to lack of knowledge and can not afford for the proper treatment after being diseased or diagnosed, so they have a greater risk of suffering from lung cancer death than that of educated and rich people. These findings emphasize the need to develop health education programs that enhance lung cancer knowledge among men and women who are in low socioeconomic groups. So, the government and NGOs should gear up for a population based counselling program.

In conclusion, according to cancer registry report of NICRH, the number of lung cancer patients in Bangladesh is increasing year by year, so it became very urgent to find out the lung cancer risk factors, that is why we conducted this study. The results obtained in this study indicate the importance of creating awareness about lung cancer risk factors among Bangladeshi people as the prevention of lung cancer warrants serious attention. Smoking is the single most preventable risk factor for lung cancer in our country. As we found most of the study patients in metastasis phase, we suggest that attempts should be made to diagnose patients at an early stage, which can come with awareness and use of various diagnostic modalities. Educational qualification and socio-economic and demographic characteristics are significantly related to lung cancer and we may define them as passive risk factors. So steps should be taken to make smooth access to health services and proper knowledge about lung cancer for the illiterate, poor, rural people. This research will be helpful to create a national database of lung cancer based on hereditary, socio-economic and demographic factors as well as can suggest guidelines for other cancers in Bangladesh. This will also suggest the risk of developing lung cancer in control population based on the score of the risk factors which will be certainly helpful for self assessment of individuals and changes their lifestyle to prevent this type of cancer.

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