RESEARCH COMMUNICATION

Awareness and Assessment of Risk Factors for Lung Cancer in Residents of Pokhara Valley

Rachit Chawla[1], Brijesh Sathian[2], Aradhana Mehra[3], Vivek Kiyawat[1], Ashvita Garg[1], Kriti Sharma[4]

Abstract

Objective: The objective of this study was to evaluate the awareness and assessment of lung cancer risk factors with respect to sociodemographic factors among residents of Pokhara Valley, Nepal. Materials and Methods: A cross sectional study was carried out in 240 residents between 01 September 2009 and 31 March 2010 using a structured questionnaire containing details of lung cancer risk factors viz., smoking, environmental pollution, insecticide exposure, hereditary factors, protective diet and socio demographic details. Descriptive statistics and testing of hypothesis were used for the analysis using EPI INFO and SPSS 16 software. Results: In the 240 subjects, the mean age was 33.4 ± SD 11.4 years, with a slight male preponderance in gender distribution (57.5% males vs. 42.5% females). 32.5% out of the study population were smokers (43.5% of males and 17.6% of females). Relationships could be established between gender and smoking (p=0.001, odds ratio=3.58), stoppage or restriction of tobacco use (p=0.001), smoking by mother during subjects' childhood as a motivation to develop smoking habit (p= 0.001), tobacco use as a cause of cancer (p=0.001), cancer as the most dreaded disease (p=0.009). Positive relationships were found between educational level and risk factors viz. smoking by mother during subjects' childhood (p= 0.03), wood or coal exposure causing lung cancer (p=0.0001), protection from lung cancer by consumption of green and yellow vegetables (p=0.0001) and insecticide exposure as a cause of lung cancer (p=0.0001). No strong relationship could be established between gender and outdoor pollution (p=0.721), insecticide exposure (p=0.219), protective diet (p=0.979) and hereditary factors (p=0.273). Conclusion: Awareness of lung cancer by tobacco use and other risk factors varied with socioeconomic status amongst residents of Pokhara. Despite their awareness of smoking as a risk factor for lung cancer, most of them still continue to smoke. Government and NGOs should gear up a population based counselling programme in this community.

Keywords: Awareness - smoking - lung cancer - risk factors - Nepal

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Introduction

Lung cancer is a leading cause of cancer death in both men and women. Mortality from lung cancer remains very high in the world amongst all cancers (Parkin et al., 2001). It is the most frequent malignant disease and is 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). Almost half (49.9%) of the cases occur in the developing countries, a big change since 1980, when it was estimated that 69% were in developed countries (Parkin et al., 2005). The high rates of tobacco consumption as well as the diversity of tobacco products available influence the profile of common cancers (Ghaffar et al., 2004). The age standardized rate (ASR) of lung cancer for both sexes in Nepal was found to be 19.3 for the year 2008 (Ferlay et al., 2010). The average survival at five years in the United States is 15%, in Europe is 10% and in developing countries it is 8.9% (Parkin et al., 2005). In Nepal, incidence wise, it is the most common malignancy in males and third most common malignancy in females (Ferlay et al., 2010); it is noteworthy, that Nepal has amongst the highest percentage of smokers with males accounting for 48% and females 29% (Machael et al ., 2001). Tobacco use, especially cigarette smoking, accounts for up to 90% of all lung cancer deaths worldwide (Hopland, 1995; Wingo et al ., 1999). 13 million people die of cigarette smoking each year, 70% of which are from developing countries (Parkin et al., 1994). Fewer than 20% of cigarette smokers, however, develop lung cancer, suggesting that other factors play a role in the disease (Wright et al., 2000). Other causes of lung cancer include environmental factors such as tobacco smoke, radon and various occupational exposures. Diet and pre-existent non malignant lung disease also have been associated with the risk for developing lung cancer (Richard et al., 2002). The

*[1]Final MBBS Students, Manipal College Of Medical Scienes, Pokhara, Nepal, [2]Department of Community Medicine, Manipal College of Medical Sciences, Pokhara, Nepal, [3]Human & Physical Sciences Research Group, Faculty of Education, Health & Sciences, University of Derby, England, [4]Medical University of Pleven, Bulgaria *For correspondence : rachitchawla23@gmail.com*

occupational environment provides an ideal opportunity for introducing cancer prevention by eliminating or decreasing the exposure. Many studies in occupational cancer epidemiology show the decrease in the risk of cancer-followed prevention (Simonato et al., 1991). Lung cancer is the most common cancer expected to occur in men and women in 2010 (Jemal et al., 2010). Also excess incidence of lung cancer has been found in men compared to women in all racial/ethnic socioeconomic strata (Krieger et al., 1999). The objective of this study is to evaluate the awareness and assessment of lung cancer risk factors with respect to socio demographic factors.

Materials and Methods

Study design and participants

A cross-sectional, self-administered anonymous questionnaire-based survey was carried out. The survey was carried out in a community setting and data was collected from lakeside residents of Pokhara valley, which is the tourist capital of Nepal having exposure to cultural influences. We used a convenient sample of population in lakeside, Pokhara because of exploratory nature of the study.

Questionnaire design

Extensive review of literature, exploratory research and qualitative piloting informed the development and refinement of a structured questionnaire in English. There were series of questions such as the smoking status of the subject, of father and mother who lived with the responder. Then there were questions about the knowledge of known risk factors associated with lung cancer such as whether smoking lung cancer, wood or coal exposure causes lung cancer, insecticide exposure causes lung cancer, role of hereditary factor in lung cancer etc. The items were not grouped according to the type of question so that the individual influence of each variable could be examined.

Data collection

This study was carried out between 01 September 2009 and 31 March 2010. A total of 240 people were selected, comprising 138 males (57.5%) and 102 females (42.5%) of the total study samples. The study subjects were requested to complete a self-reported anonymous questionnaire. 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. Oral consent was taken from all subjects. Under the supervision of interviewers (authors), the questionnaires were completed and collected.

Data management and statistical analysis

The smoking status of the respondents was classified, based on the self-report, in a yes/no response format. Of the people who responded in the affirmative, questions were asked regarding the amount and type of tobacco consumed. The gender, educational level and occupation were considered in the analysis to mediate the demographic factors which had an influence on other variables. The other variables that were considered were the smoking status of parents during subject's childhood, whether cancer was the most feared disease, and risk factors of lung cancer viz., smoking, environmental pollution (wood or coal smoke exposure), insecticide exposure, hereditary factors, and protective diet. The data was analyzed using Excel 2003, R 2.8.0 Statistical Package for the Social Sciences (SPSS) for Windows Version 16.0 (SPSS Inc; Chicago, IL, USA) and the EPI Info 3.5.1 Windows Version. The chi-square test was used to examine the association between different variables. A p-value of < 0.05 (two-tailed) was used to establish statistical significance.

Results

Demographic Characteristics

In the 240 subjects, the mean age of individuals was calculated to be 33.4 ± SD 11.4 years, gender distribution showed a slight male preponderance (57.5% males vs. 42.5% females). Total 32.5% of the study population are

Table 1. Cross Tabulation of Gender, Risk Factors and Awareness of Risk Factors of Lung Cancer

		Males (n=138)	Females (n=102)	P-Value
Smoking status	Yes	60	18	0.001**
	No	78	84	
Tried to stop using tobacco or cutting down	Yes	18	12	0.001**
	No	42	6	
Mother smoking status during subjects' childhood	Yes	66	12	0.001**
	No	72	90	
Is lung cancer caused by tobacco use	Yes	138	90	0.001**
	No	0	12	
Disease feared the most- Cancer	Yes	66	54	0.009**
	No	72	48	
Does wood or coal exposure cause lung cancer	Yes	78	60	0.721
	No	60	42	
Green and yellow vegetables protect from lung cancer	Yes	114	84	0.979
	No	24	18	
Hereditary factor	Yes	30	24	0.273
	No	108	78	
Insecticide exposure can cause lung cancer	Yes	12	6	0.413
	No	126	96	

**Statistically significant ($p<0.05$)

Table 2. Cross Tabulation of Educational Level, Risk Factors and Awareness of Risk Factors of Lung Cancer

		Education level			P-Value
		Illiterate	up to HSEB	Graduate	
Smoking status	Yes	12	48	18	0.2299
	No	18	90	54	
Father smoking status during subjects' childhood	Yes	18	74	36	0.6538
	No	12	66	36	
Mother smoking status during subjects' childhood	Yes	6	54	18	0.0342*
	No	24	84	54	
Is lung cancer caused by tobacco use	Yes	20	132	72	0.0001*
	No	10	6	0	
Does wood or coal exposure cause lung cancer	Yes	12	84	60	0.0001*
	No	18	54	12	
Green and yellow vegetables protect from lung cancer	Yes	12	132	54	0.0001*
	No	18	6	18	
Insecticide exposure can cause lung cancer	Yes	0	48	36	0.0001*
	No	30	90	36	

HSEB, Higher Secondary Education Board, Nepal (Equivalent to Class 12), *Statistically significant

Table 3. Cross Tabulation of Smoking Status and Occupation of Lakeside Residents of Pokhara

Occupation	Yes	No	Number	Percentage of Total (n=240)
Business#	54	54	108	45
Cook	0	12	12	5
Driver	6	0	6	2.5
Engineer	0	6	6	2.5
Farmer	6	0	6	2.5
Housewife	0	30	30	12.5
Police	6	12	18	7.5
Student	6	30	36	15
Tailor	0	6	6	2.5
Teacher	0	6	6	2.5
Travel agent	0	6	6	2.5

Includes shop owner (confectionary, café and hotel owners)

smokers of which 43.5% are males and 17.6% females.

Table 1 reveals significant difference in smoking prevalence amongst males and females. Males were smoking 4 times more (odds ratio= 3.58) compared to females. 30% male smokers and 67% female smokers have tried to stop using tobacco or cut down. There was a significant effect of smoking by mother during childhood in those subjects' who took up smoking in later life. Significant relationship was also found between gender and lung cancer caused by tobacco use. 47.8% males and 53% females feared the most from having cancer. No significant statistical relationship was found between gender and other risk factors of lung cancer viz., outdoor pollution, insecticide exposure, protective diet and hereditary factor.

Table 2 depicts relationship between educational level and smoking and other risk factors. In our study smoking prevalence was the highest in illiterate group (40%) followed by HSEB group (34.7%) and minimum among graduates (25%).

A statistically significant relationship was found between the subjects' educational level and smoking by mother during subjects' childhood, knowledge of wood or coal exposure causing lung cancer, insecticide exposure causing lung cancer, protective role of diet in lung cancer. Both amongst smokers and non smokers 50% feared cancer as the most dreaded disease amongst road accidents, diabetes, tuberculosis, cancer, influenza, heart diseases, respiratory diseases.

Table 3 shows cross tabulation of smoking status and occupation of lakeside residents of Pokhara. Profession wise, smoking was found to be more prevalent amongst people in business, farmers and drivers whereas it was found low amongst students and police personnel. It was absent amongst housewives, tailors, travel agents and teachers.

Discussion

A hospital based study showed 20.9% prevalence of lung cancer in Pokhara with CI (18.4-23.6) (Sathian et al., 2010). Awareness study on lung cancer is important in Nepal as the prevalence of smoking is as high as 38.4% as per global youth tobacco survey country report 2009 (WHO, Nepal) which is slightly higher than the prevalence in our study (32.5%).

In our study, males smoked more than females which is similar to the findings in a study of smoking prevalence and predictors in western Nepal (Binu et al., 2010). In our study, smoking was found to be more prevalent in low educational level population, the findings of which are also supported by an international comparison study where smoking was found to be more prevalent among the less educated (Cavelaars et al ., 2000). The death rate for all cancers combined among less-educated (<12 years of education) compared with more-educated (>12 years of education) people was more than twice as high in men and about 40% higher in women (Jemal et al ., 2008).

In this study, only 38.5 % of the smokers tried to cut down their smoking which is far less as compared to a study done by Eiser et al., (1985) in London in which 81.5% respondents wanted to cut down or stop their smoking. Therefore proper counselling, programs and policies to promote cessation and reduce smoking are to be provided by the public health workers and government in the lake side region of Pokhara. Also cessation of smoking has been associated with a declining risk for lung cancer, the relative risk for lung cancer among former smokers begins to drop 5 years after they quit smoking and continues to drop thereafter; however, the relative risk

in former smokers is never the same as the risk of lifelong non smokers (Halpern et al., 1993).

Parental smoking was found to influence the smoking behaviour amongst the respondents in our study which is found to be an important factor in the early onset smoking proved in a previous study (Engels et al., 2004). Parents' low educational attainment acted as a moderate to strong risk factor for the initial onset of smoking (Chassin et al., 1992).

In our study, influence of smoking by mother during subjects' childhood was found to be very significant for adolescent tobacco use. This may be because the people in their adolescence are given the message nonverbally that tobacco use is desirable, socially acceptable, safe, healthy, and prevalent in society (Conrad et al., 1992; Dusenbury et al., 1992; Botvin et al., 1994). Mothers, in children's eyes, have an influential role, and are providers of knowledge, who steer them in the right direction. Therefore, by setting a good example of healthy living, parents can help their children make healthy choices in life (Zhang et al., 2005).

Awareness of smoking as a primary risk factor for lung cancer was found to be 100% amongst males and 88% in our study in females which is well documented even in study by (Salber et al., 1961) according to which smoking is the most important environmental risk factor of lung cancer. 90% of all lung cancer is caused by tobacco smoking, including active cigarette smoking, pipe and cigar smoking, and exposure to second-hand smoke (U.S. Department of Health and Human Services, 1982; 1989).

In this study, knowledge of smoke exposure and lung cancer causation by burning wood or coal was 57.5% amongst all respondents as smoke from domestic fuel (i.e. coal, wood, biomass) used for cooking and heating has been associated with lung cancer (Mumford et al., 1987; Hernandez-Garduno et al., 2004; Hosgood et al., 2008; Lan et al., 2008).

People were well aware of role of diet (82.5% knew about their protective role), that is, green and yellow vegetables which are good source of β-carotene in protecting them from lung cancer since it has been proved to be beneficial; however its role is still controversial in some case control studies (Pg 2069-2071; Oxford Textbook of Oncology, 2nd edition) 22% of the people only responded as having knowledge about the role of hereditary factor in the causation of the disease. A study has shown 6.1 fold increases in the incidence of lung cancer in families in which the proband (a patient who is the initial member of a family to come under study) contracted lung cancer between the age of 40-59 years (Shwartz et al., 1996).

When compared by educational level awareness of risk factors, that is, wood or coal exposure, insecticide exposure causing lung cancer and protective role of diet, was the lowest amongst illiterate and the highest amongst graduates, similar to the result found in a study of knowledge and beliefs about smoking and cancer among women in 5 European countries (Li et al., 2010).

Smoking prevalence was found to be the lowest amongst teachers and cooks while it was higher amongst drivers, farmers and people in business and this finding was similar to the result found in study done in California (Leigh, 1996).

In conclusion, Knowledge and beliefs about lung cancer and smoking varied significantly by socio-demographic factors amongst lake side residents of Pokhara. Most of the people continue to smoke. Results emphasize the need to develop health education programs that enhance lung cancer knowledge among men and women who currently smoke and are in low socioeconomic groups. So, the government and NGOs should gear up for a population based counselling programme in this community.

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