Smoking Habits and their Effects on Different Histological Types of Non-Small Cell Lung Cancer (NSCLC) among Kashmiri Population

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Abstract
This prospective study was conducted with the aim to determine the effect of smoking habits on different histological types of non-small cell lung cancer among male and female Kashmiri population. A total of 65 patients out of which 55 males and 10 females with histological documentation of non-small cell lung cancer were enrolled in the study. Patients with malignancy were presented with average age of 58.94 years; most of them were within the age range of 50 to 84 years. A detailed history was taken in each case that revealed active smokers 80% of which cigarette smokers were 59.61%, hookah (water pipe) 32.69 % and bidi smokers 13.46 %. It was also observed that non-small cell lung cancer was more common among cigarette smoker (80%) followed by active hookah smokers (5%). Adenocarcinoma was the main histological type of lung cancer associated with all types of smoking habits, followed by squamous cell carcinoma. The major symptom which was seen in the patients having non-small cell lung cancer is cough (53 out of 65). Beside cough other major symptoms were dyspnea 56.92 % and weight loss 56.92%. Haemoptysis were seen in 33.8% of the patients, 30.7% patients were having chest pain, 29.23 % patients were having fever and 29.23 % patients complain of having hoarseness of voice.
Keywords: Smoking, non-small cell lung cancer, adenocarcinoma, Kashmiri population

Introduction

Lung cancer is the most common cancer worldwide accounting for about 18% of all cancers in men (Jemal and Bray, 2011; Brambilla *et al.*, 2001). There are 2- 2.5 million cancer cases present at any given point of time in India (Rwat *et al.*, 2009). Lung is the leading site of cancer in males as per the three urban cancer registries of India (Ganesh *et al.*, 2011.). The incidence of lung cancer is increasing rapidly, mainly due to progressive change in life style (Dhar *et al.*, 1993; Parkin., 1989). It remains a major health problem in Kashmir valley and constitutes nearly 9.9% of all cancers (Shah *et al.*, 1990; Koul *et al.*, 2010). The epidemiology of lung cancer is dominated by its association with smoking. The dramatic increase in cancer death rates among men and the more recent increase among women can be attributed to increase in cigarette consumption (Forbes *et al.*, 2006). Lung cancer is responsible for about one million deaths per year at present and will rise to three million per year by the year 2010 (Long., 2012). Smoking is a major risk factor for lung cancer with approximately 90% to 95% of new lung cancers resulting from active smoking (Ferlay *et al.*, 2015). Tobacco exposure has been strongly associated with non-small cell lung cancer than any other type (Riely *et al.*, 2008). The current study was undertaken to determine the risk of smoking habits on different histological types of lung cancer in Kashmiri population.

Material and Methods

A total of 65 patients with the diagnosis of non-small lung cancer were studied prospectively between January 2014 and June 2015 in the Department of Clinical Biochemistry at SKIMS Srinagar, Kashmir. All patients had

histologically and cytologically proven cancer of the lung determined through CT guided FNAC/ biopsy 80%, bronchoscopy 15.38% and both 4.61%. Besides routine history, a detailed history was taken in each case regarding smoking habits that included duration of smoking and the type of smoking. The occupational history and the association with non-small cell lung cancer were also stressed upon in the history.

Results and Discussion

With effect from January 2014 to June 2015, 65 patients with histologically proven non-small cell lung cancer were enrolled in the study. There were 55 male and 10 female patients. Majority of patients were in the age group of 50-84 years. All patients had histologically /cytologically proven cancer of the lung determined through CT guided FNAC/ biopsy 80%, bronchoscopy 15.38% and both 4.61 % (Figure 1). As per the occupational status, 34% were farmers, 27.69% service class, 18.46% housewives and others 23.07% (Table 1). The history of active smoking was present in 80% and 20% were non-smokers but had definite history of house hold smoke exposure since their childhood/adolescence. Among 80% of active smokers, 59.61% were cigarette smokers. Hooka and Bidi smokers were 32.69% and 13.46% respectively (Table 2). It is interesting to note that 45.6% of patients had started smoking below 20 years of age. Majority, 64.61% had smoked for 11-30 years. Adenocarcinoma was the main histological type of non-small cell lung cancer associated with all types of smoking habits, followed by squamous cell carcinoma. The major symptom which was seen in the patients having non-small cell lung cancer is cough (53 out of 65). Beside cough other major symptoms were 56.92 % dyspnea and 56.92% weight loss. Haemoptysis were seen in 33.8% of the patients, 30.7% patients were having chest pain, 29.23 % patients were having fever and 29.23 % patients complain of having hoarseness of voice (Figure 2).

Table 1: Occupational status of patients with NSCLC

Occupation	Number
Farmer	20
Service Class	18
House Wife	12
Others	15

Table 2: Smoking status of patients diagnosed as NSCLC.

Smoking status	Number	Percentage
Smokers	52	80
Cigarette	31	59.61
Hookah (water pipe)	17	32.69
Bidi	7	13.46
Non Smokers	13	20

Lung cancer is the most frequently malignant disease and the most common cause of cancer death in the world. A recent study shows that Srinagar, Jammu and Kashmir has the highest incidence of lung cancer among males in India (Koul *et al.*, 2010). The lung cancer was predominantly seen in male, who accounted for 84.61%. The male female ratio was 1:1 in this study. A significant proportion of the cases in the study were within range of 50-70 years (68%) the mean age was 58.94 years. Most common symptom experienced by the patients was cough and were associated with 53 patients who were suspected for lung cancer. The next most common symptom reported were 56.92% dyspnea and 56.92% weight loss. Haemoptysis were seen in 33.8% of the patients, 30.7% patients were having chest pain, 29.23% patients were having fever and 29.23% patients complain of having hoarseness of voice (Figure 2). Most common radiological finding in lung cancer patients was space occupying lesion (mass) which was found in 66.15% of all malignant patients (43). It was on the right side of lung in 32 patients (74.41%) and on the left side of lung in remaining 11 patients (25.58%). Other major radiological finding was pleural effusion in 22 patients (33.84%). Finally out of all NSCLC cases fifteen i.e 23.07% patients had squamous cell

carcinoma, fifty i.e 76.92% had adenocarcinoma. The most histological type among smokers (cigarette, bidi and hookah) was adenocarcinoma of about 80.76% (Figure 3).

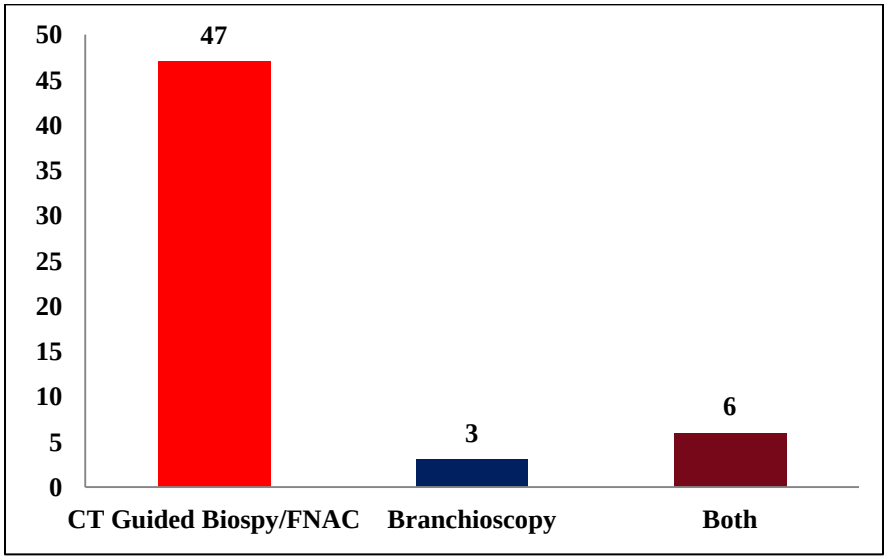

Figure 1: Diagnostic procedures used for identification of NSCLC patients (enrolled in the study)

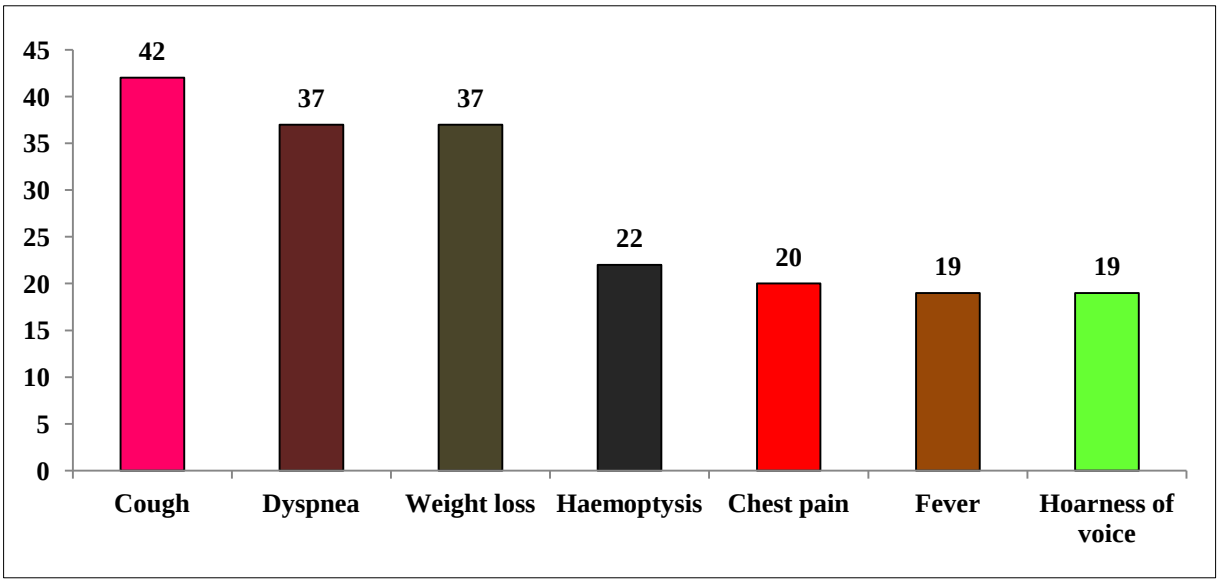

Figure 2: Symptoms found in NSCLC patients (enrolled in the study)

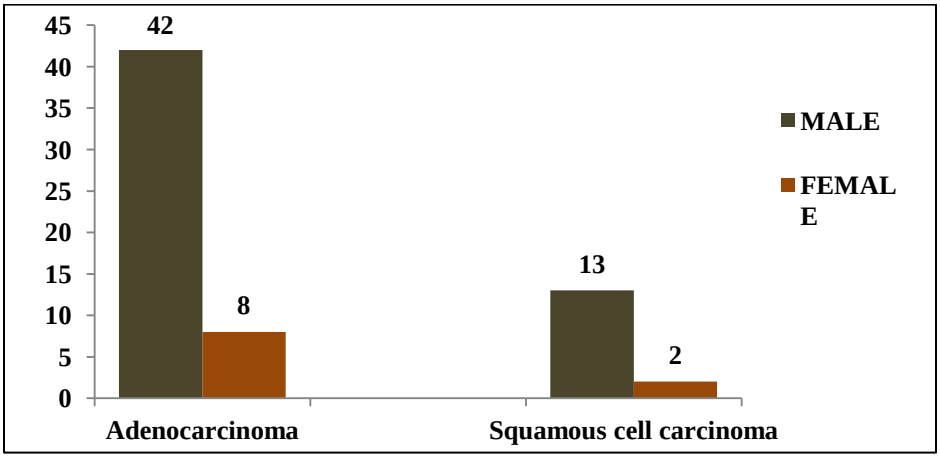

Figure 3: Histological type found in the patients having NSCLC

Conclusion

The present study demonstrates that majority of the patients having adenocarcinoma were males and smokers. Lung cancer was more common among farmers, who were active hooka smokers. The findings of the current study are limited due to small sample size in the strata, our results need to validate by large size studies.

References

Brambilla, E., Travis, W. D., Colby, T. V., Corrin, B. and Shimosato, Y. 2001. The new world health organization classification of lung tumors. ***Eur. Respir. J.* 18:** 1059-1066

Dhar, G. M., Shan, G. N. and Naheed, B. 1993. Epidemiological trend in the distribution of cancer in Kashmir valley. ***J. Epidemiol. Commu. Hlth***. **47:** 290-292.

Ferlay, J., Soerjomataram, I., Ervik, M., Dikshit, R., Eser, S., Mathers, C., Rebelo, M., Parkin D. M., Forman, D. and Bray, F. 2015. ***International Journal of Cancer***. **136 (5):** 359–386.

Forbes, S., Clements, J., Dawson, E., Bamford, S., Webb, T., Dogan, A., Flanagan, A., Teague, J., Wooster, R., Futreal, P. A. and Stratton, M. R. (2006). The Catalogue of Somatic Mutations in Cancer (COSMIC) ***Br. J. Cancer*. 94 (2)**: 318–322.

Ganesh, B., Sushama, S. and Monika. 2011. S. A case-control study of risk factors for lung cancer in Mumbai, India. ***Asian Pac. J. Cancer***. **12**: 357-362.

Jemal. A, Bray , F., Center, M.M., Ferlay, J., Ward, E. and Forman, D. 2011. Global cancer statistics. *CA: A* ***Cancer Journal for Clinicians***. **61 (2):** 69-90.

Koul, P. A., Kaul, S. K. and Sheikh, M. M. 2010. Lung cancer in Kashmir valley. ***Lung India***. **25**:131-1377.

Longo, D. L., Fauci, A. S., Kasper, D. L., Hauser, S. L., Jameson, J. L. and Loscalzo, J. 2012. ***Approach to the Patient with Cancer, Harrison's Principles of Internal Medicine (2v. 18th ed.).*** McGraw Hill Education. 4012 pp.

Parkin, D. M. 1989. Trends in lung cancer incidence worldwide. ***Chest.* 96:**5S-9S.

Riely, G. J., Kris, M. G., Rosenbaum, D., Marks, J., Li, A., Chitale, D. A., Nafa, K., Riedel, E. R., Hsu, M. and Pao, W. 2008. Frequency and distinctive spectrum of KRAS mutations in never smokers with lung adenocarcinoma. ***Clin. Cancer. Res***. **14**: 5731–5734.

Rwat, J., Sindhwani, G. and Gaur. D. 2009. Clinico-pathological profile of lung cancer in Uttarakhand. ***Lung India*. 26**: 74-76.

Shah, A. and Jan, G. M. 1990. Pattern of cancer at Srinagar (Kashmir). ***Ind. J. Pathol. Microbiol***. **33**: 119-123.