

Role of Smoking in Primary Pulmonary Malignancies in Central Punjab

Muhammad Riaz Hussain,¹ Saeed Akhtar Khan,² Mulazim Hussain Bukhari³

Abstract

Three hundred patients of primary malignancies of the lung from Gulab Devi Chest Hospital and other hospitals of Lahore were studied. The history of the Patients and their clinical findings were recorded. The sections of all the cases were stained with haematoxylin and eosin whereas all large cell carcinomas were stained with Alcian Blue – Periodic Acid – Schiff (AB – PAS) stain. Significantly large numbers of patients (70%) were smokers. 83.33% of patients were cigarette smokers whereas 7.14% were hukka smokers. The remaining (9.53%) was taking both cigarette and hukka. Amongst the cases of squamous cell carcinoma, the number of smokers was significantly more ($P < 0.001$) as compared to those of adenocarcinoma. Adenocarcinoma cases had significantly less ($P < 0.02$) number of smokers as compared with small cell carcinoma.

Key Words: Smoking, Lung Cancer, Squamous Cell Carcinoma, Small cell Carcinoma, Adenocarcinoma.

Introduction

Malignancies of the lung remain one of the most frequently diagnosed malignant neoplasms throughout the world.¹⁻³

In Pakistan, amongst the males, the malignant tumours of the bronchus ranked number one.⁴ Various regional studies also show that malignancies of the lungs are a common malignancy of the male in Pakistan.⁵⁻⁶

Development of malignancies of the lung is multifactorial process. These factors include smoking,^{7,30} ionizing radiation, metals, diffuse pulmonary fibrosis⁸ and asbestos exposure.¹

The most important factor for causing lung carcinoma is smoking. The role of tobacco smoke in the development of malignancies of the lung is well known.^{9-11,30} Active as well as passive smoking is associated with an increase in risk of having cancer.^{7,10} A study conducted by Jubelirer and Wilson¹² concluded cigarette smoking as causative factor in 80% of their patients. Smoking has also been held responsible for the rise in the incidence of bronchogenic carcinoma in India.¹³

However relatively few people who develop malignancies of the lung are exposed to an occupation – associated carcinogen and since only about 10% of cigarette smokers develop malignancies of the lung, other unknown factors appear operative.^{1,14}

Therefore the present study was carried out to see the role of smoking in primary pulmonary malignancies in central Punjab.

Hussain M.R.¹
Associate Professor Histopathology
Azra Naheed Medical College, Lahore

Khan S.A.²
Associate Prof Pathology, King Edward Medical University,
Lahore

Bukhari M.H.³
Associate Prof Pathology, King Edward Medical University,
Lahore

Materials and Methods

Three hundred patients of primary malignancies of the lung from Gulab Devi Chest Hospital and other hospitals of Lahore were included in this study. Gulab Devi Chest Hospital drains the maximum number of cases of pulmonary malignancies from the region of central Punjab. Patients of all ages and both sexes were included in the study.

History of the patients regarding name of patient, age, and sex, presenting complaints with duration, and smoking habits were recorded. Patients were examined clinically; lymph node enlargement was noted and recorded along with relevant investigations, x-ray chest, Bronchoscopy, and CT Scan (if available).

The specimens included were bronchial biopsy, transthoracic core needle lung biopsy, open lung biopsy and/or regional lymph node biopsy.

The sections of all the cases were stained with haematoxylin and eosin whereas all large cell carcinomas were stained with Alcian Blue – Periodic Acid–Schiff (AB – PAS) stain,¹⁵ without diastase as well as with diastase.

The tumors were classified according to WHO classification.¹⁶ Chi square test was used for statistical analysis.

Results

In our study of 300 cases of primary pulmonary malignancies a total of 210 cases were smokers, which is significantly large number as compared with nonsmokers (Table 1). Amongst the smokers 83.33% of patients were taking cigarette whereas 7.14% were using hukka (Table 2). The remaining (9.53%) was taking both cigarette and hukka.

The distribution of histological lesion in smokers and nonsmokers is given in table 3.

Table 1: Smoking Habits of 300 Cases of Malignancies of the Lung.

Smoking Habit	No. of Cases	Percentage
Smoker	210*	70.00
Non-smoker	68	22.67
Unknown	22	7.33
Total	300	100.0

*p < 0.001 when compared with non-smokers

Table 2: Types of 210 Smokers in 300 Cases of Malignancies of the Lung.

Type of Smoke Used	No. of Cases	Percentage
Cigarettes	175	83.33
Hukka	15	7.14
Cigarette + Hukka	20	9.53
Total	210	100.0

Table 3: Smoking Habits of Different Histological Types of 300 Cases of Malignancies of the Lung.

S. No.	Histological Type	Smoker	Non-smoker	Unknown
1.	Squamous cell carcinoma	106*	20	4
2.	Small cell carcinoma	47	11	10
3.	Adenocarcinoma	28**	20	6
4.	Large cell carcinoma	22***	11	0
5.	Others	7	6	2
	Total	210	68	22

* P < 0.001 as compared with adenocarcinoma

** P < 0.02 as compared with small cell carcinoma

*** P < 0.05 as compared with squamous cell carcinoma

Discussion

Malignancies of the lung remain one of the most frequently diagnosed malignant neoplasms throughout the world.² It is the number one cause of cancer death in the American males and females.^{11,17-19,30,31} Bronchogenic carcinoma is being diagnosed with increasing frequency in China, Japan, Canada, and European countries, as well as in India.²⁰⁻²⁴ Similarly in Pakistan, malignant tumours of the lung ranked number one, among males.^{4,25}

Cigarette smoke is the most common pollutant that the human lungs are exposed to.²⁶ In this study of 300 cases of primary lung carcinoma 70% of patients were smoker, whereas smokers in other studies were ranged from 80 – 90%.^{11,12,19,27,30,32}

Active as well as passive smoking is associated with an increase in risk of having malignancies of the lung.^{7,10} Squamous cell carcinoma and small cell carcinoma are strongly associated with smoking.^{9,28}

Amongst the cases of squamous cell carcinoma, the number of smokers in this study was significantly more ($P < 0.001$) as compared to those of adenocarcinoma. This is in accordance with the study of Jindal et al¹³ and Auerbach and Garfinkel²⁸ who reported that adenocarcinoma are associated less directly with smoking.

Cases of adenocarcinoma included significantly less ($p < 0.02$) number of smokers as compared with small cell carcinoma. Our results are similar with the study of Jett et al²⁹ who concluded that there is high association of smoking and small cell carcinoma.

Thus in conclusion this study has highlighted the role of smoking in primary malignancies of the lung.

References

1. Hammar SP. Common neoplasms. In : Dail DH, Hammar SP (eds). Pulmonary pathology. 2nd Ed. New York: Springer – Verlag, 1994: 1123-78.
2. Parkin DM, Pisani P, Ferlay J. Global Cancer Statistics. CA Cancer J Clin 1999; 49: 33-64.
3. Cancer Research UK. Statistics. [On Line] [cited 2002, August 15] Available from <http://www.cancersearchuk.org/about/cancer/statistics>.
4. PMRC. Malignant tumours: Report of a multicentric study. Karachi: Pakistan Medical Research Council, 1982: 1-15.
5. Ahmad I. A morphological evaluation of bronchial biopsy, washing and brushing using fiberoptic bronchoscope in lung disease [Thesis]. Lahore : University of the Punjab, 1986.
6. Ahmad M, Khan AH, Mansoor A. The pattern of malignant tumours in Northern Pakistan – Rawalpindi: Armed Forces Institute of Pathology [AFIP Monograph] 1990: 1-62.
7. Weiss ST. Passive smoking and lung cancer. What is the risk? [Editorial]. Am Rev Respir Dis 1986; 133: 1-3.
8. Mooi WJ, Addis BJ. Carcinoma of the lung. In: Corrin B (ed). The Lungs. 3rd Ed. Edinburgh: Churchill Livingstone, 1990; 5: 341-72.
9. Morabia A, Wynder EL. Cigarette smoking and lung cancer cell types. Cancer 1991; 68: 2074-78.
10. Biesalki HK, Bueno de Mesquita B, Chesson A, Chytil F, Grimble R, Hermus RJJ, et al. European Consensus Statement on Lung Cancer: Risk Factors and Prevention. CA Cancer J Clin 1998; 48: 167-176.
11. American Lung Association. Facts About Lung Cancer [On Line]. [cited 2002, Dec 10]. Available from <http://www.lungusa.org/diseases/lungcanc.html>.
12. Jubelirer SJ, Wilson RA. Lung cancer in patients younger than 40 years of age. Cancer 1991; 67: 1436-38.
13. Jindal SK, Malik SK, Dhand R, Gujral JS, Malik AK, Datta BN. Bronchogenic carcinoma in Northern India. Thorax 1982; 37: 343-47.
14. Progress Review Groups. Report of the Lung Cancer Progress Review Group August 2001 [On Line]. [cited 2002, Dec 15]. Available from <http://Prg.nci.nih.gov/lung/default.html>.
15. Cook HC. Carbohydrates. In: Bancroft JD, Stevens A (eds). Theory and Practice of Histological Techniques. 3rd Ed. Edinburgh: Churchill Livingstone, 1990: 177-214.
16. WHO. Histological Typing of Lung and Pleural Tumours. 3rd Ed. Geneva: World Health Organization, 1999.
17. Fretz PC, Petterson MW. Lung Tumors: A multidisciplinary Database: Diagnosis [On Line]. [cited 2002, Nov 11]. Available from <http://www.vh.org/adult/provider/radiology/LungTumors/ClinicalPresentation/Text/SignsandSymptoms.html>.
18. Rolfe M, Tockman MS. Lung Cancer [On Line]. [cited 2002, Nov 29]. Available from http://www.merck.com/pubs/mm_geriatrics/sec10/ch81.htm.
19. Lung Cancer.org.Lung Cancer101|About Lung Cancer [On Line]. [cited 2002, Nov 10]. Available form http://www.lungcancer.org/patients/fs_patient_about.htm.
20. Tanaka I, Matsubara O, Kasuga T, Takemura T, Inoue M. Increasing incidence and changing histopathology of primary lung cancer in Japan - A review of 282 autopsied cases. Cancer 1988; 62: 1035-39.
21. Fergusson RJ, Gregor A, Dodds R, Kerr G. Management of lung cancer in South East Scotland. Thorax 1996; 51: 569-74.
22. Srivastava R. Lung Cancer Rises Sharply [On Line]. [cited 2002, Nov 29]. Available from http://www.healthlibrary.com/news/19_24_feb/times_lung_cancer_rises_sharply20.htm.
23. Kejing Y, Enguo C, Chen Z, Fadden DM. Comparison Between Young And old Patients with Lung Cancer [On Line]. [cited 2002, Nov 29]. Available form <http://www.cmj.org/3wl/3wy/yingkejing2.htm>.
24. Canadian Cancer Society. Cancer Statistics [On Line]. [cited 2002, July 27]. Available from <http://www.cancer.ab.ca/stats/index.htm>.
25. Fikree FF. Reproductive Health in Pakistan: Evidence and Future Directions. JPMA 2002; 52: 1-12.
26. Sköld CM, Hed J, Eklund A. Smoking cessation rapidly reduces cell recovery in bronchoalveolar lavage fluid, while alveolar macrophage fluorescence remains high. Chest 1992; 101: 989-95.
27. Cancer Updates. Lung Cancer In Canada [On Line]. [cited 2002, Dec 4]. Available from http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/updates/lungs_98_e.html.
28. Auerbach O, Garfinkel L. The changing pattern of lung carcinoma. Cancer 1991; 68: 1973-77.
29. Jett Jr, Cortese DA, Fontana RS. Lung cancer: Current concepts and prospects. Ca-A Cancer J Clin 1983; 33:

- 74-86.
30. Martin T. Smoking and Cancer Statistics for the U.S. [On Line]. [cited 2008, October 22]. Available from http://www.quitsmoking.about.com/lr/smoking_and_cancer/88052/1/
31. American Cancer Society. Cancer Reference Information. [On Line]. [cited 2008, October 20]. Available from http://www.cancer.org/docroot/cri/cri_o.asp
32. Lung cancer. Cancer Research UK [On Line]. [cited 2008, October 20]. Available from <http://www.cancerresearchuk.org/cancerstats/types/lung/?a=5441>