

DEMOGRAPHICS OF BRONCHOGENIC CARCINOMA PATIENTS AND FREQUENCY OF CELL TYPES

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ABSTRACT

Background: Bronchogenic carcinoma can present in many ways. The diagnosis of its different types is important because of its effect on prognosis and management. Geographical and socio-economic factors such as climate, culture, ethnic origin, diet and life style have been noted to influence the occurrence of this disease. We conducted this study to document the frequency of various histological types of bronchogenic carcinoma and correlated it with their demographic characteristics.

Material and Methods: This descriptive study was carried out in the Department of Medicine, Bahawal Victoria Hospital, Bahawalpur, Pakistan. Thirty consecutive histopathologically &/or cytologically confirmed cases of bronchogenic carcinoma were included in the study. These patients were admitted from January 2001 to May 2002. History was taken in detail with emphases on personal particulars, past and present occupation and living conditions. Specimens for histopathological study were collected by trans-thoracic needle aspiration or bronchoscopy.

Results: Four types of bronchogenic carcinoma were found; squamous cell carcinoma 60%, small cell carcinoma 20%, adenocarcinoma 13.33% and large cell carcinoma 6.66%. Among these, seventeen males and one female patient proved to have squamous cell carcinoma were in the age group between 46-89 years and the majority was from the urban areas. While cases with small cell carcinoma belonged to the age group between 56-74 years, being six in total and all were males; four from urban and two from rural areas. On the other hand patients with adenocarcinoma belonged to the age group 50-89 years, being four in total with three females and one male, with only one female from rural area. In addition we found two city dweller males with large cell carcinoma belonging to the age group of 50-79 years.

Conclusion: Bronchogenic carcinoma in our setup is more frequent beyond the middle age. It is more common in males and urban dwellers. On histological examination, squamous cell carcinoma is the commonest variety followed by small cell carcinoma. Adenocarcinoma is more common in females.

Key words: Bronchoscopy, Cytology, Bronchogenic carcinoma, Squamous cell carcinoma, Smoking.

INTRODUCTION

Bronchogenic carcinoma can present in a myriad of ways and the skilled clinician using different available diagnostic techniques in the light of his knowledge and experience leads to prompt diagnosis and staging.¹ Whenever clinical presentation, sputum analysis or chest radiograph raises the possibility of lung carcinoma, a tissue diagnosis is mandatory. The knowledge of its histopathological variety is also very important in the calculation of its prognosis.²

Geographical and socioeconomic factors such as climate, culture, ethnic origin, diet and life style have been noted to influence the occurrence of this disease. Cigarette smoking and occupational exposure have been shown to increase the risk of certain types of lung cancers.^{3,4}

Classification introduced by World Health Organization (WHO) includes; large cell, neuroendocrine and spindle/giant cell categories. It has also extended consideration to paraneoplastic lesions.⁵ Squamous cell carcinoma, adenocarcinoma, small cell carcinoma and large cell carcinoma account for more than ninety percent of all the cases of bronchogenic carcinoma. Squamous cell carcinoma is the most common type but recently the incidence of adenocarcinoma is increasing among the female population.⁶

The diagnosis of different types of lung carcinoma is important because of their independent disease prognosis and management. For example small cell lung cancer is rapidly growing and highly malignant; it is the only type of lung carcinoma that responds well to chemotherapy. The majority (80%)

of small cell lung carcinomas present in advanced stage with widespread metastasis.⁷ On the other hand, surgery is the mainstay of treatment in cases of non-small cell lung carcinoma. Moreover, continuous hyper fractional radiotherapy is also a good option in these cases.

We designed this study to check the frequency of various histological types of bronchogenic carcinoma and their correlation with age, gender, occupation and living conditions in our setup.

MATERIAL AND METHODS

This descriptive study included 30 consecutive patients of bronchogenic carcinoma admitted through outpatient department in Bahawal Victoria Hospital, Bahawalpur, Pakistan, from January 2001 to May 2002. All the patients were admitted with suspicion of bronchogenic carcinoma on clinical &/or radiological grounds and were subjected to histological sampling, either by trans-thoracic needle aspiration (TTNA) or by bronchoscopy. No age, gender, environmental or occupational limits were applied for the selection of patients. Patients already diagnosed by some other hospital presenting to our unit with complications were not included in the study. Patients admitted with the suspicion of lung carcinoma on clinical and/or radiological grounds but later on turning out either to be a case of benign lung tumor such as bronchial adenoma and hamartoma or sarcoma were also not included in the study. Patients having metastasis in the lungs with primary lesions elsewhere in the body were also not included in the study.

Written informed consent was taken from all these patients. Details about the patients name, age, gender, address, date of admission and past and present occupation and histopathology &/or cytology report showing the type of bronchogenic carcinoma

were recorded in a specifically designed pro-forma.

RESULTS

Age range of patients with bronchogenic carcinoma varied from 46 to 84 years, mean age being 58.61 years. Majority of patients i.e. 73.33% (n=22) were found to be in their sixth to seventh decade of life. Gender distribution revealed that bronchogenic carcinoma was more common in males 86.66% (n=26) as compared to females 13.44% (n=4). Thus male to female ratio turned out to be 6.5:1. Most of the patients in the study belonged to urban areas 63.34% (n=19), while 36.66% (n=11) came from the rural population. Hence the ratio between urban and rural population in this study was 1.7:1. (Table-1)

In urban population, all males with bronchogenic carcinoma were smokers while the only one female was non-smoker. In rural population 81.81% of patients were smokers and only one male and one female were non-smokers.

Furthermore, farmers (30% of the study population) were most commonly affected with two-third suffering from squamous cell carcinoma and one-third having small cell carcinoma. The next in descending order were office workers (26.66%) and the rest were shopkeepers, laborers and drivers, mainly residing in the urban areas. All females in the study population were housewives.

Biopsy was taken during bronchoscopy in 26 (86.66%) patients. The results of histopathology in 26 patients are were; 17 (65.38%) squamous cell carcinoma, 6 (23.07%) small cell carcinoma, 2 (7.70%) large cell carcinoma and 1 (3.85%) adenocarcinoma.

Trans-thoracic needle aspiration was performed in 5 (16.66%) cases. The results of cytology

Table-1: Correlation of bronchogenic carcinoma with age, gender and living environment.

Age of Patients			Gender		Living Environment	
Decade	Number of cases	Percentage	Male	Female	Urban	Rural
Fifth	2	6.66%	2	0	2 (6.66%)	0
Sixth	13	43.33%	11	2	8 (26.66%)	5 (16.66%)
Seventh	9	30.00%	8	1	6 (20%)	3 (10%)
Eighth	4	13.33%	3	1	1 (3.33%)	3 (10%)
Ninth	2	6.66%	2	0	2 (6.66%)	0
Total	30	100%	26	4	19 (63.34%)	11 (36.66%)

Table-2: Gender distribution of bronchogenic carcinoma according to the histological type.

Type	Male	Female	Total
Squamous cell carcinoma	17 (56.66%)	1 (3.33%)	18 (59.99%)
Small cell carcinoma	6 (19.99%)	0	6 (19.99%)
Large cell carcinoma	2 (6.66%)	0	2 (6.66%)
Adenocarcinoma	1 (3.33%)	3 (10.00%)	4 (13.33%)

categorized these five patients into squamous carcinoma 2 (40%) and adenocarcinoma 3 (60%). One of these patients underwent percutaneous needle aspiration as well as biopsy through bronchoscopy and his final diagnosis was moderately differentiated squamous cell carcinoma.

Squamous cell carcinoma turned out to be the commonest variety, 18 (60%) of lung cancers in our study. Morphologically all grades of differentiation were observed. There were 14 (77.77%) cases of well-differentiated, 1 (5.55%) of moderate and 3 (16.66%) of poorly differentiated epidermoid carcinomas. On the other hand, small cell carcinoma was found to be the second common variety of lung carcinoma i.e. a total of 6 (20%) cases. The subjects included in this group were further classified into three sub-groups. Thus, there were 4 cases of oat cell carcinoma, 1 of intermediate cell type and one of anaplastic type. Adenocarcinoma was diagnosed in 4 biopsies, one taken by bronchoscopy and the other three by percutaneous needle aspiration. In these only one patient was male, while the rest were females. Large cell carcinoma was shown in 6.66% lung cancers. (Table-2)

DISCUSSION

Bronchogenic carcinoma is the commonest and devastating malignant tumor all over the world in males. Bronchogenic carcinoma ranked the most frequent cancer in men at Karachi in a study through 1995 to 2002.⁸

In a total of 30 cases of bronchogenic carcinoma in our study, four histopathological types were found. Subjects ranged from 46 to 84 years of age with 58.61 years being the average age. The mean age in males was 57.53 and in females 49.8 years. The maximum numbers of cases were found to be in their sixth to seventh decade of life. Similarly, a study carried out by Karlikaya⁹ also proved that maximum patients were in their sixth and seventh decade at the time of diagnosis of bronchogenic carcinoma. Another study conducted by Chughtai AS,¹⁰ on the contrary, found that most of the affected patients

were in their fifth decade while the subjects were in their fifth and sixth decade in a study by Butcovan.² In our study 6.66% of the cases were below 50 years of age, which is similar to a study conducted by Schottenfeld D.¹¹

Among 30 cases, 26 were males and four females giving a male to female ratio of 6.2:1. According to Radzikowska¹² lung carcinoma was six times more frequent in men as compared to women. In the western world, there is a trend that the incidence in males is declining, while it is increasing in females.¹³

The patients were also categorized into those coming from urban and the ones from rural areas with a ratio of 1.7:1, which is quite less to the ratio observed by Memon MA,¹⁴ (2.09:1) and Chaudhry MK,¹⁵ (2.03:1).

Surprisingly, in urban population, all males with bronchogenic carcinoma were smokers while the only one female was non-smoker. In rural population 81.81% of patients were smokers and only one male and one female were non-smokers.

Coming to the occupational distribution in our study subjects, thirty percent patients were farmers, 26.66% office workers and the rest were shopkeepers, laborers and drivers. According to Strauss GM¹⁶ the risk of developing bronchogenic carcinoma was on an increase among farmers. As previously found in Sweden and Netherlands, the risk of lung cancer remained low among farmers while skilled workers had twice the risk than teachers and academicians.¹⁷

On the basis of histopathology of specimens collected through bronchoscopy of 26 patients, following results were obtained; Squamous cell carcinoma 17 cases, small cell carcinoma in 6 cases, large cell carcinoma in 2 while adenocarcinoma in only one. According to a study conducted by Mushtaq S,¹⁸ the most commonly diagnosed malignant neoplasm, on the basis of bronchoscopy, was squamous cell carcinoma, followed by small cell carcinoma and adenocarcinoma.

TTNA was performed in 5 of the 30 cases revealing adenocarcinoma in 3 and squamous cell carcinoma in 2 of the cases. Ijaz AM¹⁴ also studied the role of TTNA in 48 cases in making the diagnoses of mass in the chest and found that squamous cell carcinoma was present in 15 of the cases and adenocarcinoma in 6 of them. Squamous cell carcinoma was the commonest variety; 18 (60%) of lung cancer cases in this study. Squamous cell carcinoma continues to be the most frequent histological type.¹⁹ Chughtai AS¹⁰ observed in his study that the average age was 43.8 years with the number of cases between 20 and 75 years. They consisted of 17 males and 1 female making a male to female ratio of 17:1.

Small cell carcinoma was found to be the second commonest variety of lung carcinoma i.e. a total of 6 (20%) cases. According to Gerda,²⁰ 9.25% of 77 patients turned out to be small cell carcinoma. Their ages ranged between 56 and 74 years with an average age of 64.16 years. Study by Chughtai AS¹⁰ revealed, 44.3 years being the average age among 30 patients with small cell carcinoma. Maximum number of cases were seen in their seventh decade. All the cases were males.

One case in our study was of intermediate cell type amongst the small cell carcinomas constituting 16.66% of tumors in this sub-group and 3.33% of all lung carcinomas. The age of the patient in this group was 56 years.

Adenocarcinoma was diagnosed in 4 biopsies, one taken by bronchoscopy and the other three by percutaneous needle aspiration. Their ages ranged between 55 and 84 years. The average age was found to be 65.25 years. One was male, making male to female ratio as 1:3. Female sex is associated with adenocarcinoma.¹⁹ A prospective study at Sweden found, adenocarcinoma being the most common type among female population and squamous cell carcinoma in males.¹³

Large cell carcinoma showed an incidence of 6.66% amongst lung carcinomas. The youngest patient was a 59 years old male and the oldest was 72 years with an average age of 65.5 years. Mean age was 65 years among patients of large cell carcinoma analyzed by Chughtai AS¹⁰ in his study of 76 patients which is exactly similar to that in our study. All the patients of large cell carcinoma were males.

Although the sample size in our study was not big enough yet it is enough to know the socio-demographic distribution of different varieties of bronchogenic carcinoma in our set up.

CONCLUSION

Bronchogenic carcinoma is more frequent beyond the middle age in our setup. It is more com-

mon in males and urban dwellers. On histological examination, squamous cell carcinoma is the commonest variety followed by small cell carcinoma. Adenocarcinoma is more common in females.

REFERENCES

1. Hyer J, Silvestri G. Diagnosis and staging of lung cancer. *Clin Chest Med* 2000; 21: 95-106.
2. Butcovan D, Borza C, Chisalita I, Mihaescu T, Grigoras C, Mihailovici MS. The histopathological study of the bronchopulmonary carcinoma. *Rev Med Chir Soc Med Nat Iasi* 2001; 105: 509-13.
3. Takkouche B, Gestal-Otero J. The epidemiology of lung cancer. Review of risk factors and Spanish data. *Eur J of Epidemiol* 1996; 12: 341-349.
4. Osann K. Epidemiology of lung cancer. *Curr Opin Pulm Med* 1998; 4: 198-204.
5. Franklin W. Diagnosis of lung cancer: pathology of invasive and pre-invasive neoplasia. *Chest* 2000; 117: 80-89.
6. Kuo C, Chen Y, Chao J, Tsai C, Perng R. Non-Small cell lung cancer in very young and very old patients. *Chest* 2000; 117: 35-7.
7. Park B, Louie O, Altorki N. Staging and the surgical management of lung cancer. *Radiol Clin North Am* 2000; 38: 545-561.
8. Bhurgri Y, Bhurgri A, Usman A, et al. Patho-epidemiology of lung cancer in Karachi (1995-2002). *Asian Pac J Cancer Prev* 2006; 7: 60-64.
9. Karlikaya C, Cakir Edis E. Lung cancer histopathology in the Thrace region of Turkey and comparison with national data. *Tuberk Toraks* 2005; 53: 132-38.
10. Rumi R. Induced sputum and cytological diagnosis of lung cancer. *Lancet* 1991; 338: 976-77.
11. Zaman SK, Arshad M. Bronchogenic carcinoma in females Proceedings of 5th All Pakistan Biennial Cancer Conference held at Lahore 6-7 Oct. 1995.
12. Radzikowska E, Glaz P, Roszkowski K. Lung cancer in women: age, smoking, histology, performance status, stage, initial treatment and survival. Population-based study of 20 561 cases. *Ann Oncol* 2002; 13: 1087-93.
13. Koyi H, Hillerdal G, Branden E. A prospective study of a total material of lung cancer from a county in Sweden 1997-1999: Gender, symptoms, type, stage, and smoking habits. *Lung Cancer* 2002; 36: 9-14.
14. Payne PW, Sebo TJ, Doudkine A, et al. Sputum screening by quantitative microscopy: A re-examination of a portion of the National Cancer Institute Cooperative Early Lung Cancer Study. *Mayo Clin Proc* 72: 697, 1997
15. Chaudhary K, Rasul S, Iqbal Z, et al. Fiberoptic bronchoscopy-role in the diagnosis of bronchogenic carcinoma. *Biomedica* 1998; 14: 32-36.

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16. Spitz MR, Wu X, Lippman SM. Markers of Susceptibility. In Roth JA, Cox JD, Hong WK (eds): Lung cancer, ed 2. Maiden, Blackwell Science, Inc, 1998, P1.
17. Liu BQ, Peto R, Chen ZM, et al. Emerging tobacco hazards in China; 1: retrospective proportional mortality study of one million deaths. BMJ 1998; 317: 1411-22.
18. Gahery SH, Molinier F V, Boulaire C, et al. Phase I trial of recombinant adenovirus gene transfer in lung cancer. Longitudinal study of the immune responses to transgene and viral products. J Clin Invest 1997; 100: 2218-26.
19. Santos-Martinez MJ, Curull V, Blanco ML, et al. Lung cancer at a university hospital: epidemiological and histological characteristics of a recent and a historical series. Arch Bronchoneumol. 2005; 41: 307-12
20. Gerda E, Palmgren F, Elsebeth L. Lung cancer, smoking, and environment: A cohort study of the Danish population. BMJ 1996; 312: 1259-63.

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