

Clinicopathologic Profile of Bronchogenic Carcinoma

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ABSTRACT

Introduction: Bronchogenic carcinoma is the most common cancer in the world. It can present in many ways. Accurate diagnosis and categorization into different types is important because of its effect on prognosis and management. We conducted this study to find out the frequency of various histological types of bronchogenic carcinoma and correlate with their clinicopathologic profile.

Methods: This is a retrospective study conducted in 174 histopathologically proven cases of bronchogenic carcinoma that were referred from different parts of the country to a private hospital in Kathmandu over a period of 4 years.

Results: The mean age of the patients developing bronchogenic carcinoma was 64 years. Squamous cell carcinoma was the commonest histologic subtype followed by small cell carcinoma. Adenocarcinoma was more common in females. Clinical history was available in 133 cases. Among them, almost all patients had a history of smoking, the average number of pack years being 39.99. Most of the patients consulted doctor for chief complaint of cough and shortness of breath, the average duration of symptoms being 117.53 days.

Conclusions: The lung cancer must be ruled out in all patients who have persistent signs and symptoms of pulmonary disease with a history of smoking.

Key Words: *bronchogenic, histopathology, smoking*

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INTRODUCTION

Bronchogenic carcinoma once considered to be a rare disease, has reached almost epidemic proportions. It is the leading cause of cancer deaths in developed countries and its incidence is rising at alarming rates in developing countries.¹ Owing to the improvement of modern surgical technique, the chances of successful intervention in bronchogenic carcinoma have much improved and histology plays an important role in prognosis. Evidences show that various types of bronchogenic carcinoma have different relationship as to sex, occupation and smoking habits.²

Bronchogenic carcinoma is the commonest malignancy in men over 50 years of age. It is not so common in young ages. However, there have been reports of an increase in the incidence of bronchogenic carcinoma in patients below 40 years of age.³ The rise may be due to an increase in the smoking habit and also exposure to other carcinogens. There are not many published studies regarding the pattern of bronchogenic carcinoma in our country. Hence the study was conducted to shed light in this regard.

METHODS

A retrospective study which included cases referred from various parts of the country to the pathology department of Mount Everest Hospital from July 2004 to June 2008. It included 174 histopathologically proven cases of bronchogenic carcinoma. Patients with metastatic cancer to the lungs, mesothelioma and carcinoid tumor were not included in the study. All patients were diagnosed on the basis of clinicoradiologic, bronchoscopic, cytologic and histopathologic findings. Histopathology was taken as the gold standard for diagnosis. Details of smoking were noted with regard to the number of pack years smoked. Bronchoscopic findings were recorded carefully with regard to side, site and type of lesion. The histologic typing was based on the accepted system of classification of lung cancer. Statistical analysis were done in statistical package for social science (SPSS) version 16 for windows.

RESULTS

A total of 174 cases (35.5%) of lung cancer were diagnosed from July 2004 to June 2008 out of 490 lung biopsy (including pleural) sent for evaluation. Out of 310 lung biopsy performed on male patients, 120 (38.7%) turned out to be malignant where as 54 (30%) cases of malignancy was diagnosed among 180 lung biopsies performed female patients. The male to female ratio for bronchogenic carcinoma was 2.2:1 (figure1).

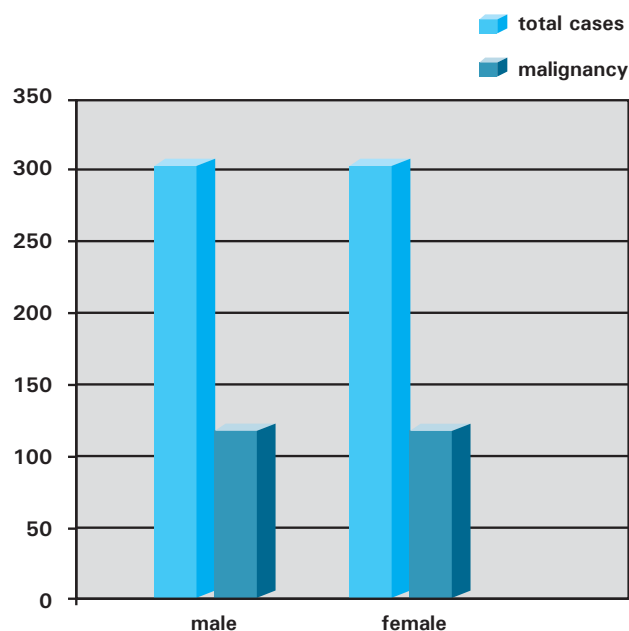


Figure 1. Distribution of cases in male and female patients

The mean age of the patient with lung cancer was 64 years. The youngest patient was 32 years old and oldest was 88 years old at diagnosis. Most of the cases were diagnosed during sixth to seventh decade of life. Histologic typing

Squamous cell carcinoma was the commonest subtype in both sexes followed by small cell carcinoma. Squamous cell carcinoma was more frequent in males where as adenocarcinoma was more frequent in females (Table 1)

Table 1. Distribution of histopathological types of lung cancer

Malignancy	Male	Female	Total
Squamous cell carcinoma	79	27	106
Small cell carcinoma	25	9	34
Adenocarcinoma	5	9	14
Adenosquamous carcinoma	5	6	11
Bronchioloalveolar carcinoma	2	1	3
Large cell carcinoma	3	0	3
Clear cell carcinoma	1	0	1
Undifferentiated carcinoma	2	0	2

Detail history could be traced out in 133 cases. The clinical, radiologic as well as bronchoscopic findings among them are as follows.

Clinical features of patients

The average duration of symptoms at the time of diagnosis was 117.3 days. Most of the patients presented with clinical complaint of cough, shortness of breath and weight loss (Table 2). One case was diagnosed incidentally due to presence of mass lesion on chest X-ray done for

pre-operative evaluation for cholecystectomy.

Table 2. Clinical presentation of bronchogenic carcinoma

Symptoms	Number (%)
Cough	131 (98.49)
Shortness of breath	85 (63.90)
Wheeze	22 (16.54)
Hemoptysis	61 (45.86)
Loss of weight	84 (63.15)
Loss of appetite	81 (60.90)
Chest pain	47 (35.33)
Fever	23 (17.29)
Hoarseness of voice	10 (7.51)

Among 133 cases, history of smoking was present in 114 (85.71%) cases. Eight (6.01%) cases were non smokers where as in 11 (8.27%) cases, history of smoking could not be traced out. Surprisingly, all 8 patients who never smoked in their lifetime and developed lung cancer were females only. Among smokers, the mean number of cigarette pack years smoke was 39.99.

Chest X ray was done in as a preliminary investigation, which revealed mass lesion in most of the cases. Contrast enhanced CT scan report was available in some of the cases (61 cases). Bronchoscopy was done in most of the cases followed by bronchial wash, bronchial brushing and biopsy. The specimens obtained were sent for pathological evaluation. Majority of the patients had lesions in right lung (74; 55.63%). Bronchoscopy was performed in 122 cases of which exophytic growth was seen in 88 (72.13%) cases. Submucosal growth was noted in 19 (15.57%) cases where as stenosis of the bronchus was observed in 6 (4.91%) cases. Cancer was found in 9 (7.37%) patients who had a non diagnostic bronchoscopy, in which the biopsy was taken randomly from the bronchial wall. Specimen from peripherally located lesions were obtained with transthoracic needle biopsy.

DISCUSSION

Bronchogenic carcinoma is the commonest and devastating malignant tumor all over the world in males.⁴ The frequency of bronchogenic cancer in our country is also alarming, however, due to lack of adequate literature, the exact incidence of it can not be documented. A study done in Tribhuvan University teaching hospital revealed lung cancer as the second most common cancer.⁵ This is probably the largest study of its kind taking into account 174 cases of bronchogenic carcinoma which were proven by histopathology.

In a total of 174 cases of bronchogenic carcinoma in our study, eight histopathological types were found. The patients ranged from 32 to 88 years, the average age at diagnosis being 64 years. The maximum number of cases were found to be in seventh decade of life. In a similar study, Karlikaya also found that the maximum patients were in their sixth and seventh decade of life.⁶ Interestingly, most of the patients having bronchogenic carcinoma were smokers (85.71%).

The effect of smoking on bronchial mucosa has been extensively studied. Due to smoking, the transport activity of ciliated cells of the respiratory tract is inhibited. The ciliary action is reduced by 50 percent from only two to three puffs of smoking. Filter cigarettes are of no help; they produce similar results. Due to loss of ciliary processes there is interference with the removal of inhaled carcinogens that are present in the smoke from the respiratory tract. Cigarette smoke is known to contain carcinogenic agents, arsenic, benzopyrene and benzathrecene. These carcinogens act as chronic stimuli to bronchial mucosa causing dysplasia, squamous metaplasia and carcinoma in situ. The stimulus like chronic smoking, if persistent, may lead to a point of no return, the invasive carcinoma. There is relationship between the amount of cigarette smoking and frequency of certain changes in the bronchial epithelium, including basal cell hyperplasia or dysplasia, loss of ciliated columnar cells and carcinoma in situ.²

In our study, the male to female ratio for lung cancer was found to be 2.2, which is in contrast with a study conducted by Radzikowska, which revealed male is to female ratio of 6.2: 1.⁸ The increased incidence of bronchogenic carcinoma in female may be due to increased incidence of smoking in women compared to other countries. All eight non smokers developing lung cancer were females only. Interestingly, among these eight cases, three were adenocarcinoma, 2 were adenosquamous carcinoma, two were squamous cell carcinoma and one was small cell carcinoma. This finding supports the well known fact that adenocarcinoma develops more frequently than any other histologic type of lung cancer in individuals (particularly women) who have never smoked.^{9,10}

In the present study, most of the patients consulted the doctor for persistent pulmonary symptoms. The average duration of symptoms before diagnosis was about four months. Cough, shortness of breath, loss of weight and appetite, chest pain, wheeze and fever were common complaints among them. Hemoptysis, which is an alarming symptom in chronic smoker, was present in 61 cases. Interestingly, five of the cases were on Anti tubercular treatment for variable duration, for tuberculosis of lung, before a diagnosis of bronchogenic carcinoma was made. Sayami et al also observed that 18% of the patients were wrongly diagnosed as tuberculosis and being treated with antitubercular drug for 1 to 6 months period before being diagnosed as lung cancer.¹² This highlights the need of diagnostic tests in all patients with persistent pulmonary symptoms or abnormal findings on chest radiograph to exclude the possibility of bronchogenic carcinoma.

Owing to the improvement of modern surgical technique, the chances of successful intervention in bronchogenic carcinoma have much improved and histology plays an important role in prognosis and treatment. Evidence has been accumulated in the past showing that various histological types of bronchogenic carcinoma have different relationships, as to sex, occupation and smoking.² In our study, squamous cell carcinoma was the commonest carcinoma in both sexes, followed by small cell carcinoma and adenocarcinoma. Regarding the sex incidence, squamous cell carcinoma is the most predominant tumor of men. Similar finding was observed in our study; the frequency of squamous cell carcinoma in male was 79(74.52%). Contrary

to the trend of lung cancer in the world, squamous cell carcinoma is the most common cancer in female as well in our study. However, the frequency of adenocarcinoma in female was higher than in males.

Squamous cell carcinomas are most of the time central, and adenocarcinomas are peripheral in location. The centrally located lesions, most of the time, if not always, outcasts the patient from surgical interference, but the latter type stands an excellent chance for total resection with a better cure rate.^{4,10,13,14} In the present study, most of the squamous cell carcinoma were centrally located where as most of the adenocarcinoma were peripherally located.

The rate of growth between squamous cell carcinoma differs from that of adenocarcinoma. The former type lesion has a rapid growth rate, where as the latter is slower in progress. In the series of Weiss, the doubling time for squamous cell carcinoma

and undifferentiated carcinoma was shorter than for adenocarcinoma and brochioloalveolar carcinoma. It may require as long as 9.1 years of growth for squamous cell carcinoma to achieve a size of 2 cm in diameter, and for an adenocarcinoma, 25.5 years of growth to achieve a 2 cm diameter. The histological diagnosis not only establishes the nature of the lesion but also determines the type of therapy.^{2,15,16}

CONCLUSIONS

Bronchogenic carcinoma is more frequent in seventh decade of life and is closely associated with smoking. All patients, who have persistent pulmonary symptoms with a long standing history of cigarette smoking should be screened for lung cancer for early diagnosis.

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