

Clinicopathological Profile of Patients with Bronchogenic Carcinoma at a Tertiary Care Center in Western India

Dharitri Thakkar, Pradipkumar Damor¹, Kamlesh Vithalani

Department of TB and Chest, P. D. U. Medical College, Rajkot, ¹Department of TB and Chest, Smt. NHL Municipal Medical College, Ahmedabad, Gujarat, India

Abstract

Background: Bronchogenic carcinoma is the most common malignancy all over the globe in terms of incidence and mortality, especially in males. Its increasing incidence in nonsmokers and females is also an important concern. **Objectives:** The objective of this study was to study various demographic, clinical, radiological, and histopathological features of patients with confirmed diagnosis of lung cancer. **Patients and Methods:** Patients with confirmed histopathological diagnosis of bronchogenic carcinoma attending a tertiary care center in western India were included in the study. **Results:** A total of 50 patients were studied. Of 50, 45 were male and 5 were female. Average age of the patient was 59.92 years. Forty-six (92%) patients were current or ex-smokers, whereas only 4 patients were never-smokers. Cough (90%) followed by chest pain (62%) was the presenting symptom. Soft-tissue density mass lesion was the most common radiographic finding. Adenocarcinoma (36%) followed closely by squamous cell carcinoma (32%) was the diagnosed histological subtype. Of 50, 9 (18%) patients had evidence of distant metastasis at the time of diagnosis. **Conclusions:** This study concludes that adenocarcinoma was the most common subtype even in smokers. A high index of suspicion and prompt investigations in a patient with respiratory symptoms should be employed to diagnose patients at an early stage.

Keywords: Adenocarcinoma, lung cancer, smoking, squamous cell carcinoma

INTRODUCTION

Bronchogenic carcinoma is the most common malignancy all over the world in terms of both incidence and mortality. There were estimated 1.8 million new cases in 2012 (12.9% of total), 58% of which occurred in the developing countries. It also remains the most common malignancy in men worldwide (1.2 million, 16.7% of total). It is the most common cause of death from cancer worldwide, accounting for 1.59 million deaths per year (19.4% of total). In females, incidence rates are lower than that of males, but its incidence and mortality are rising.^[1]

In India, the incidence and mortality of lung cancer are rising, mainly due to changing smoking practices. Studies have emphasized the association of smoking habit with bronchogenic carcinoma and differences in relative risk rates in different communities based on the smoking habit. Significant epidemiological and cell type differences exist in India as compared to the West. The males are predominant sufferers, with average age around 54 years. Squamous cell carcinoma is the most common type, followed by adenocarcinoma, small-cell carcinoma, and large-cell carcinoma. Adenocarcinoma mostly

occurs in nonsmokers and females.^[2] The incidence of adenocarcinoma is rising in India.^[3,4]

Tobacco smoking is the most common cause of bronchogenic carcinoma. The etiological association between smoking and lung cancer was reported in the 1940s and was established in the 1950s by epidemiological research.^[5,6] The first US Surgeon General's Report on Smoking and Health was published in 1964 and concluded that cigarette smoking was causally related to lung cancer.^[7]

Following the cessation of smoking, the risk of developing carcinoma of the lung has been shown to decline progressively with time. However, even after 10–20 years of smoking cessation, the risk is still about 2.5 times that of nonsmokers.^[8] Other risk factors include exposure to

Address for correspondence: Dr. Dharitri Thakkar, "Parijat," Gyanjivan Society, Street No. 3, Raiya Road, Rajkot, Gujarat, India. E-mail: dhari.17@gmail.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Thakkar D, Damor P, Vithalani K. Clinicopathological profile of patients with bronchogenic carcinoma at a tertiary care center in Western India. *Indian J Respir Care* 2019;8:80-3.

Received: 19-10-2018 **Revised:** 05-12-2018 **Accepted:** 13-01-2019

Access this article online	
Quick Response Code: 	Website: www.ijrconline.org
	DOI: 10.4103/ijrc.ijrc_47_18

occupational and environmental pollutants, passive smoking, and chronic lung diseases.^[9-11]

The present study aims at studying various demographic characteristics, clinical features, and results of various radiological and pathological investigations.

The objectives of the present study were to study various demographic characteristics, clinical features, and diagnosis of patients with bronchogenic carcinoma.

PATIENTS AND METHODS

This cross-sectional, observational study was carried out at the Department of Pulmonary Medicine at a Tertiary Care Level Medical College located in Western India. All patients with confirmed diagnosis of bronchogenic carcinoma by histopathological examination of material obtained by transthoracic needle aspiration, pleural fluid aspiration, or lymph node fine-needle aspiration cytology (FNAC) were included in the study. Patients with only radiological diagnosis of bronchogenic carcinoma (without histopathological confirmation) were not included in the study. Informed written consent was obtained from patients before enrollment in the study.

RESULTS

Demographic characteristics

A total of 50 patients were included in this study. Of 50 patients, 45 patients were male and 5 patients were female. The ratio of male: female was 9:1. The mean age of the patients was 59.92 years, i.e., about 60 years. The mean age in females was 56 years. The average age in males was 60.35 years. The youngest patient was of 41 years, whereas the oldest patient was of 80 years. The highest number of patients belonged to the age group of 51–60 years (19 patients, 38%). Of 50 patients, 27 (54%) belonged to rural areas, whereas 23 (46%) belonged to urban areas.

Clinical presentation

The symptoms and signs seen in the patients included in this study are given in Tables 1 and 2.

Radiological presentation

In the present study, 33 patients (66%) presented with right lung lesion, whereas 16 patients (32%) had left lung lesion. One patient had bilateral lesions on chest X-ray, with multicentric lung lesions. Upper and middle zone lesions were more common than lower zone lesions. The most common radiographic pattern was soft-tissue density mass lesion ($n = 33$, 66%) followed by pleural effusion ($n = 10$, 20%) and signs of collapse ($n = 8$, 16%). Other findings were mediastinal widening, nodular pattern, rib erosion, cavitation, and combination of findings [Table 3].

Metastasis

Of 50, 9 (18%) patients had evidence of distant metastasis, which included metastasis in liver ($n = 7$), adrenal glands ($n = 1$), and skeletal system and brain ($n = 1$).

Table 1: Symptoms

Symptom	Number of patients (%)
Cough	45 (90)
Chest pain	31 (62)
Hemoptysis	21 (42)
Dyspnea	34 (68)
Facial puffiness	3 (06)
Constitutional symptoms	44 (88)

Table 2: Clinical signs

Clinical sign	Number of patients (%)
Pallor	9 (18)
Clubbing	32 (64)
External lymphadenopathy	8 (16)
Engorged neck veins	3 (06)

Table 3: Radiographic patterns

Radiographic pattern	Number of patients (%)
Soft-tissue density mass lesion	33 (66)
Costophrenic angle blunting	10 (20)
Hilar enlargement	8 (16)
Mediastinal widening	4 (8)
Nodular pattern	3 (6)
Rib erosion	1 (2)
Pulling of hemidiaphragm	5 (10)
Tracheal deviation	5 (10)
Cavity with air-fluid level	1 (2)

Risk factors

Forty-six patients (92%) were chronic smokers, which included 45 males and 1 female. Out of 46, 40 patients used to smoke bidis, 4 used cigarettes, whereas 2 were chillum smokers. Only 4 patients were nonsmokers. Thus, smoker: nonsmoker ratio was 11.5:1. Of 5 female patients, 4 had a history of exposure to biomass fuel, one of which was also a smoker. Eight patients had prior history of tuberculosis.

Diagnostic method employed

In the present study, in 40 patients, the diagnosis was established by cytopathological examination of tissue obtained by transthoracic aspiration, out of which 23 were performed under ultrasonography guidance and 17 were performed under computed tomography guidance. FNAC from external lymph node (cervical/supraclavicular) was performed in 6 patients. All 46 results thus obtained were positive for malignancy. Remaining 4 patients had undergone fiberoptic bronchoscopy, examination of bronchoalveolar lavage (BAL) fluid, and endobronchial biopsy. Endobronchial biopsy and BAL were positive for malignant cells in 4 and 3 patients, respectively.

Thoracentesis and cytological examination of pleural fluid for malignant cells was performed in 13 cases. Out of 13 cases, cytological examination was positive for malignant cells in 10 patients (77%), whereas 3 patients (33%) had negative

cytological examination of pleural fluid. Cytological examination of sputum for malignant cells was positive in 4 patients.

Histological type

Of 50 patients, 18 (36%) had been diagnosed with adenocarcinoma, 16 (32%) with squamous cell carcinoma, 2 (4%) with small-cell carcinoma while cell type could not be confirmed in 14 (28%) patients. Thus, adenocarcinoma was the most common histopathological type in the present study followed closely by squamous cell carcinoma. No patient was diagnosed with large-cell carcinoma [Figure 1].

Age distribution according to histopathological subtype is as follows [Table 4 and Figure 2]. Four of five female patients had adenocarcinoma, while one female patient was diagnosed with squamous cell carcinoma. Of 18 patients diagnosed as adenocarcinoma, 4 were nonsmokers, while 14 were smokers. All 16 patients with squamous cell carcinoma were smokers.

DISCUSSION

Bronchogenic carcinoma is the most common malignancy in terms of incidence and mortality. Its incidence is rising in India due to changing smoking practices. The present study aims at studying clinical and demographic profile and diagnostic findings in patients with lung cancer.

The mean age of the patients was 59.92 years, i.e., about 60 years. The highest numbers of patients were in the age

group of 51–60 years (19 patients, 38%). This data are similar to other Indian studies.^[12-15]

Of 50 patients included in the study, 45 patients were male and 5 patients were female. The ratio of male:female was 9:1. This ratio is higher as compared to other Indian studies conducted by Pujari VV *et al.* (ratio – 4.12:1), Dhandapani S *et al.* (ratio – 3.9:1), and Sundaram V *et al.* (ratio – 4.3:1).^[12-14]

In the present study, 46 patients (92%) were chronic smokers, which included 45 males and 1 female. Only 4 patients were nonsmokers. Thus smoker: nonsmoker ratio was 11.5:1. The ratio of smoker: nonsmoker ratio was higher as compared to other studies, for example, Gupta D *et al.* reported a ratio of 3.6:1,^[16] whereas Kashyap S *et al.* reported ratio of 2.4:1.^[17] The higher male-to-female ratio and higher ratio of smokers in our study may be attributed to different smoking practices and other social factors in our region.

In the present study, the most common radiographic pattern was soft-tissue density mass lesion ($n = 33$, 66%) followed by pleural effusion ($n = 10$, 20%) and signs of collapse ($n = 8$, 16%). Similar findings were reported in the study conducted by C P Sharma *et al.* (mass lesion – 49.9%, collapse – 14.2%, pleural effusion – 8.8%, and combination pattern – 24.4%).^[18] Saha A *et al.* reported collapse in 26.92%, mass lesion in 26.92%, nodules in 13.46%, consolidation in 18.72%, and pleural effusion in 10.58% of cases.^[19]

Of 50 patients, 18 (36%) had adenocarcinoma, 16 (32%) had squamous cell carcinoma, 2 (4%) had small-cell carcinoma while cell type could not be confirmed in 14 (28%) patients. Thus, adenocarcinoma was the most common histopathological type in the present study followed closely by squamous cell carcinoma.

Most of the Indian studies have reported either higher or almost similar proportion of adenocarcinoma as compared to squamous cell type.^[15,20,21] This observation is different as compared to western countries where a higher percentage of squamous cell type is reported. Furthermore, adenocarcinoma might be surpassing squamous cell type in frequency in India as demonstrated by various studies [Table 5].

Few limitations of the present study include limited use of bronchoscopy and immunohistochemistry typing of the

Table 4: Distribution of histological cell type according to age group

Histopathological type	Number of patients in each age group			
	41-50 years	51-60 years	61-70 years	71-80 years
Squamous cell carcinoma	2	7	5	2
Adenocarcinoma	5	6	6	1
Small-cell carcinoma	0	1	1	0
Undifferentiated cell type	5	5	2	2

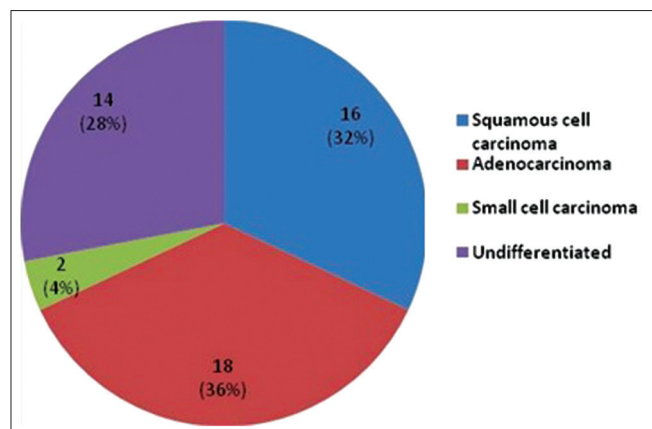


Figure 1: Histopathological subtypes of bronchogenic carcinoma

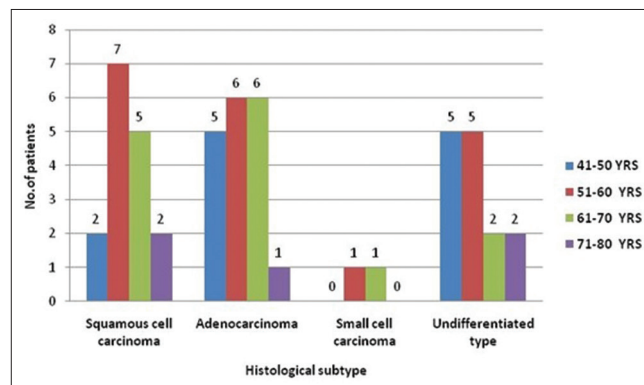


Figure 2: Age distribution according to cell type

Table 5: Comparison of the distribution of histological type of lung cancer in Indian studies

Name of study (number of patients)	Pujari <i>et al.</i> (n=82) ^[12] , n (%)	Malik <i>et al.</i> (n=397) ^[20] , n (%)	Bhadke <i>et al.</i> (n=94) ^[21] , n (%)	Dey <i>et al.</i> (n=607) ^[22] , n (%)	Present study (n=50), n (%)
Squamous cell carcinoma	20 (24.39)	100 (25.18)	30 (32)	213 (35.09)	16 (32)
Adenocarcinoma	47 (57.31)	96 (24.18)	45 (48)	187 (30.81)	18 (36)
Small-cell carcinoma	5 (6.09)	58 (14.6)	8 (8)	100 (16.47)	2 (4)
Large-cell carcinoma	1 (1.2)	6 (1.51)	2 (2)	36 (5.93)	0
Cell type undetermined	8 (9.75)	137 (34.5)	9 (10)	71 (11.70)	14 (28)
Other	1 (1.2)	0	0	0	0

specimens due to nonavailability at our institution. This may have contributed to more number of undetermined cell type and some form of biased results. Further analysis of adenocarcinoma was not done because of the unavailability of testing at our institute at the time of the study.

CONCLUSIONS

In the present study, the mean age of patients of patients is around 60 years. Cough and chest pain are the most common symptoms while soft-tissue density mass lesion on chest X-ray is the most common radiological finding. Adenocarcinoma followed closely by squamous cell carcinoma is the most common histological cell type.

Acknowledgment

The authors would like to thank the Departments of Radiology and Pathology, PDU Medical College, Rajkot.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, *et al.* GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: <http://globocan.iarc.fr>. [Last accessed on 2018 Jun 25].
- Jindal SK, Behra D. Clinical spectrum of Primary lung cancer- review of Chandigarh experience of 10 years. *Lung India* 1990;37:343-7.
- Kaur H, Sehgal IS, Bal A, Gupta N, Behera D, Das A, *et al.* Evolving epidemiology of lung cancer in India: Reducing non-small cell lung cancer-not otherwise specified and quantifying tobacco smoke exposure are the key. *Indian J Cancer* 2017;54:285-90.
- Behra D. Epidemiology of lung cancer – Global and Indian perspective. *J Indian Acad Clin Med* 2012;13:131-7.
- Wynder EL, Hoffman D. Smoking and lung cancer. *Scientific Challenges and Opportunities Cancer Res* 1995;54:5284-95.
- Doll R, Hill AB. A study of the aetiology of carcinoma of lung. *Br Med J* 1952;2:1271.
- U.S. Department of Health and Human Services. The Health Consequences of Smoking: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004.
- Doll R, Hill AB. Mortality in relation to smoking: Ten years' observations of British doctors. *Br Med J* 1964;1:1399, 1460.
- Janerich DT, Thompson WD, Varela LR, Greenwald P, Chorost S, Tucci C, *et al.* Lung cancer and exposure to tobacco smoke in the household. *N Engl J Med* 1990;323:632.
- Hammond EC, Selikoff IJ, Lawther PL, Seidman H. Inhalation of benzpyrene and cancer in man. *Ann New York Academy of Sciences* 1976;271:116-24.
- Brenner DR, McLaughlin JR, Hung RJ. Previous lung diseases and lung cancer risk: A systematic review and meta-analysis. *PLoS ONE* 2011;6:e17479. doi:10.1371/journal.pone.0017479.
- Pujari VV, Lokhande RM, Meshram SH. Clinical and pathological presentations of bronchogenic carcinoma in a tertiary care centre. *J Evolution Med Dent Sci* 2016;5:2968-71. DOI: 10.14260/jemds/2016/692.
- Dhandapani S, Srinivasan A, Rajagopalan R, Chellamuthu S, Rajkumar A, Palaniswamy P. Clinicopathological profile of lung cancer patients in a teaching hospital in South India. *J Cardiothorac Med* 2016;4:440-3.
- Sundaram V, Sanyal N. Clinicopathological profile of bronchogenic carcinoma in a tertiary care hospital in eastern part of India. *Clin Cancer Investig J [serial online]* 2014;3:220-4. Available from: <http://www.ccij-online.org/text.asp?2014/3/3/220/132114>. [Last cited 2018 Apr 28].
- Mohan A, Latifi AN, Guleria R. Increasing incidence of adenocarcinoma lung in India: Following the global trend? *Indian J Cancer* 2016;53:92-5.
- Gupta D, Boffetta P, Gaborieau V, Jindal SK. Risk factors of lung cancer in Chandigarh, India. *Indian J Med Res* 2001;113:142-50.
- Kashyap S, Mohapatra PR, Negi RS. Pattern of primary lung cancer among bidi smokers in North-Western Himalayan region of India. *Lung Cancer* 2003;41(Suppl 2):S111.
- Sharma CP, Behera D, Aggarwal AN, Gupta D, Jindal SK. Radiographic patterns in lung cancer. *Indian J Chest Dis Allied Sci* 2002;44:25-30.
- Saha A, Saha K, Ghosh S, Mitra M, Panchadhyayee P, Sarkar AP. Chest X-ray of lung cancer: Association with pathological subtypes. *J Assoc Chest Physicians* 2017;5:76-80.
- Malik PS, Sharma MC, Mohanti BK, Shukla NK, Deo S, Mohan A, *et al.* Clinico-pathological profile of lung cancer at AIIMS: A changing paradigm in India. *Asian Pac J Cancer Prev* 2013;14:489-94.
- Bhadke BB, Rathod RK, Deshmukh DG, Luniya AB, Mahajan P, Surjushe AU. Clinical profile of lung cancer in rural medical college of Maharashtra (India): A prospective study of three years. *Int J Med Res Rev* 2016;4:1063-71. doi:10.17511/ijmrr.2016.i06.34.
- Dey A, Biswas D, Saha SK, Kundu S, Kundu S, Sengupta A. Comparison study of clinicoradiological profile of primary lung cancer cases: An Eastern India experience. *Indian J Cancer* 2012;49:89-95.