

Clinical Profile of Lung Cancer in Visakhapatnam, India: A Three Year Study

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ABSTRACT

Introduction : Lung malignancy is the main and utmost type of cancer cases and mortality with raising trends in recent decades particularly in emergent countries like India. Lung malignancy can be suspected when patient presents with clinical symptoms like cough, hemoptysis or incidental abnormality on chest x-ray/ Computed Tomography or by screening with low-dose CT.

Material and Methods : A retrospective observational study done at Government hospital for chest and communicable diseases under Andhra Medical College, India from Jan 2017 to Dec 2019. Patients diagnosed with bronchogenic carcinoma either inpatient or outpatient were taken into consideration for analysis.

Results : A total of 173 subjects were considered in study for analysis. Mean age found to be 57.67±11.36 years. 121 patients were male and 52 were female. 69.36% patients belonged to rural areas. 82.08% which accounted for 142 patients were smokers. Mean smoking index was 258±246.63. Most common presentation was cough and sob i.e., 83.24%. Most common radiological presentation was mass i.e., 54.3% (94) followed by pleural effusion in 24 cases (13.8%). Adenocarcinoma was observed in 83 patients (48%) followed by squamous cell in 61 patients (35%).

Conclusion: Lung cancer was more common in elderly subjects with age >50 years with mean age of presentation in females being lower than males. Adenocarcinoma was the predominant histological type in both males and females. Smoking still continues to be the main and important risk factor for lung cancer.

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Introduction

With 2.1 million new cases and 1.8 million deaths from lung cancer anticipated for 2018, which represents nearly 1 in 5 (18.4%) cancer deaths globally, lung malignancy continues to be the most significant cause of

cancer incidence and mortality, (1). Despite the fact that lung cancer mortality has begun to decline globally, India's prevalence is rising. According to the 2020 Cancer Statistics Report from the Indian National Cancer Registry Programme, the estimated incidence of lung cancer is 98, 278 (2).

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In India, lung cancer is the third leading cause of death and the fourth most frequent cause of detection among all malignancies. In India, lung cancer is the second most frequently found malignancy and second leading cause of cancer death in men (3). Squamous cell carcinoma has been surpassed by adenocarcinoma in most Western and Asian nations (4,5). This change may be partially attributed to the smoking behaviours, notably the use of filtered cigarettes; in addition, lung cancer incidence is rising among females and non-smokers (4,6,7).

Squamous cell carcinoma has been cited as the most prevalent histology in the majority of earlier Indian studies (8,9) however, some new research from two large centers indicate that India's histology pattern is shifting (10,11). The total 5-year survival rate for lung cancer in the United States is still a pitiful 15.6%, despite the availability of novel diagnostic and genetic methods, improvements in surgical procedures, and the introduction of new biological management of lung cancer. With 5 year survival rates being estimated as only 8.9% in Europe, China and emerging nations, the situation is significantly worse even internationally. Throughout the world, mortality rates for both male and female patients vary greatly. Since smoking tobacco is the primary cause of lung cancer this gender variation reflects the smoking trend (12).

There are many studies on the histological and clinical characteristics of lung cancer from various regions of India, but there are only few studies from South India. Therefore this study was done.

Materials and Methods

This was a retrospective observational study conducted at a government institution providing tertiary care i.e Government Hospital for chest and communicable diseases attached to Andhra Medical College, Visakhapatnam, AP, South India. This study was done by collecting and analysing the case records throughout the time frame of January 2017 to December 2019. Patients who attended our hospital either as out patients or inpatients and who were suspected and

diagnosed with bronchogenic carcinoma were taken for the study.

Inclusion Criteria ;

- Patients diagnosed with primary lung malignancy
- Age more than 18 years.

Exclusion Criteria ;

- Patients with extrathoracic malignancies with lung secondaries
- Age less than 18 years
- Pregnant females

Detailed clinical history, demographic data, and smoking history, family history of lung malignancy and occupational exposure were taken in a structured predesigned format. All patients were subjected to Complete Blood Picture (CBP), Sputum for Mycobacterium tuberculosis i.e., Catridge Based Nucleic Acid Amplification Test (CBNAAT), Sputum for gram staining and culture sensitivity, Chest X-ray Posteroanterior view (CXR P/A) view, Liver function tests and renal function tests as a routine. Based on the clinical presentation they were subjected to specific investigations like Contrast enhanced computed tomography of chest (CECT chest), analysis of pleural fluid for Total cell count, Differential cell Count, Protein, Glucose and adenosine deaminase (ADA), lactate dehydrogenase (LDH), Cytology and cell block, Pleural biopsy (blind or image guided), Supraclavicular Lymph node fine needle aspiration cytology (FNAC) or Biopsy, Fibreoptic flexible bronchoscopy (FOB) and Bronchial brushings, Bronchial washings (BW) for cytology, endo-bronchial biopsy, Image guided or blind transcutaneous FNAC or biopsy to confirm and to establish histopathological diagnosis. As our hospital does not have the facility of Immunohistochemistry (IHC) or mutation analysis we could not do it in all cases. The data was compiled and statistical analysis was done using SSPS. For continuous variables means were calculated, and for categorical variables percentages were calculated.

Results

The present study considered 173 cases for analysis after strict inclusion and exclusion criteria. Mean age of incidence in the present study was 57.67 ± 11.36 . 121 were males

with mean age of 58.12 ± 11.66 and 52 were females with mean age of 56.44 ± 10.61 . In male patients more number of cases belonged to the age group range of 61-70 years whereas in female patients more number of cases were present in the age of 51-60 years. Most of the cases (120/173 - 69.36%) belong to rural areas, and 30.63% of cases belong to urban areas. Majority (142/173 -82.08%) were smokers. Only 31 (17.9%) cases were non-smokers (Table 1). Mean smoking Index was 258 ± 246.63 . Mean BMI of the patients was 23.08 ± 3.17 .

Cough with expectoration and breathlessness was the most typical complaint observed (83.24%), followed by hemoptysis and chest pain. Hoarseness of voice was present as one of the clinical presentation in 17 patients. 11 patients also had features of superior vena cava obstruction. Clubbing was the predominant physical examination finding in 61.2% cases. 24 patients had enlarged supraclavicular lymph nodes. Anemia was observed in 10.4% cases (Table 2).

The most frequent radiological presentation found is mass, that was seen in 94 (54.3%) cases followed by Pleural effusion seen in 24 (13.8%) cases. Mass with effusion in 22(12.7%) cases, Collapse was seen in 16(9.2%) cases, collapse consolidation was found in 13(7.5%) cases and consolidation was seen in 4(2.3%) cases (Table 3).

Most of the cases 99(57.2%) were diagnosed by Trans Thoracic Lung biopsy

(TTLB) followed by Fiber Optic Bronchoscopy (FOB) biopsy in 29(16.7%) of cases. Pleural Fluid (PF) cytology and cell-block was positive for malignancy in 20(11.5%) cases. Supra clavicular lymph node (SCLN) Fine Needle Aspiration Cytology (FNAC) was positive in 18 (10.4%) cases, SCLN biopsy was positive in 3(1.7%) cases. FOB brushings, Bronchial washings cytology positive in 4 (2.3%) cases.

Adenocarcinoma was observed in 83(48%) cases and squamous cell in 61(35%). Small cell carcinoma was seen in 4(2.3%) cases and large cell carcinoma seen in 1(0.5%) case. Undifferentiated histology was seen in 24 (14%) cases (Figure 1).

Among the 83 patients of adenocarcinoma 63 (75%) patients were smokers. Out of 61 sufferers of squamous cell carcinoma, smokers were 55(90%), and 4 cases of all small cell histology were smokers.

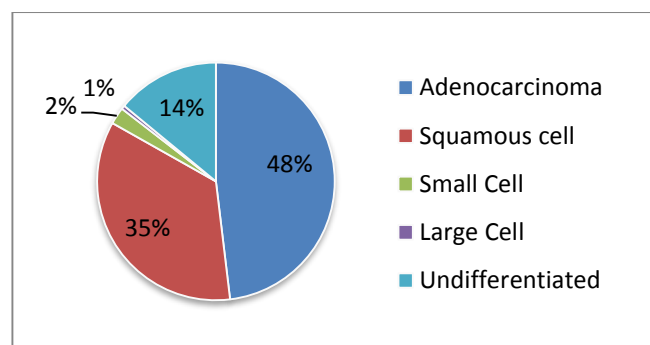


Figure 1. Histological types of Lung cancer.

Table 1. Demographic characters (Age and sex distribution, place of residence, smoking habits) of cases with lung cancer.

Variables	Sub Group	Number Of Patients (n=173), (%)
Age (years)	21-30	2 (1.15%)
	31-40	14 (8.09%)
	41-50	35 (20.23%)
	51-60	57 (32.94%)
	61-70	51 (29.47%)
	>70	14 (8.09%)
Sex	Males	121 (69.9%)
	Females	52 (30%)
Rural/Urban	Rural	120 (69.36%)
	Urban	53 (30.63%)
Smoker/Non Smoker	Smokers	142 (82%)
	Non-Smoker	31 (18%)

Table 2 . Clinical features .

S NO	Clinical feature	Number of patients (%)
1	Cough with Expectoration	144/173 (83.24%)
2	SOB	144/173 (83.24%)
3	Hemoptysis	111/173 (64.16%)
4	Chest pain	99/173 (57.22%)
5	Superior Vena Caval Obstruction	11/173 (6.35%)
6	Hoarseness Of Voice	17/173 (9.82%)
7	Clubbing	106/173 (61.27%)
8	Supra clavicular Lymph Nodes enlarged	24/173 (13.8%)
9	Anemia	24/173 (13.8%)

Among the total 52 cases of females with lung cancer 26(50%) had adenocarcinoma followed by undifferentiated carcinoma in 13 (25%) patients. Squamous cell carcinoma was found in 12(23%) cases and one had large cell histology. Among 121 total male patients 57 (47%) had adenocarcinoma and 49(40.5%) had squamous cell carcinoma. Undifferentiated carcinoma seen in 11(9%) patients and 4patients (3.3%) had small cell carcinoma (Figure 2).

Discussion

Adenocarcinoma occurrence has tremendously increased lately and adenocarcinoma has superseded squamous cell carcinoma as the most common kind of NSCLC. Apart from age, smoking is the primary risk factor for lung cancer, and its consequences are responsible for a significant fraction of all pulmonary carcinomas (13).

The mean age of presentation in the current study was found to be 57±11.364, and that was comparable to other recent studies done in India i.e conducted by Dubey et al, Mohan A et al, Thakkar D et al (14-16). In the current study males constituted 70% and females 30%. The findings are almost equivalent to other studies conducted by Bharate et al, Bhadke BB et al, Dattatreya SP et al, however

in studies conducted by Dubey et al, Mohan A et al, Thakkar D et al, the number of male patients were more compared to female patients (14-19).

Major proportion of the patients are from rural areas in the present study, which is consistent with previous studies like those done by Dubey et al, Thakkar D et al, Bharate et al, whereas in a study by Jindal et al, rural and urban patients were equal in number (14,16,17,20). 82% cases in this study were smokers, which was a similar finding in various other studies Dubey et al, Mohan A et al, Thakkar D et al, Dey A et al (14,15,16,21).

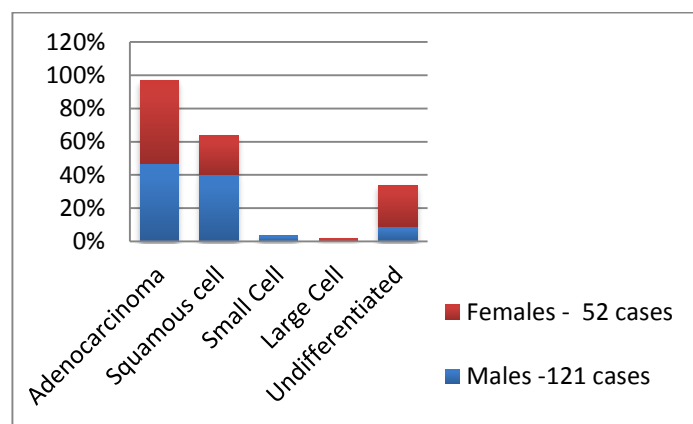


Figure 2. Gender distribution of different histologies of lung cancer .

Table 3. Imaging Findings .

S NO	Radiological presentation	No of cases (%)
1	Mass	94 (54.33%)
2	Pleural Effusion	24 (13.87%)
3	Mass with Effusion	22 (12.7%)
4	Collapse	16 (9.2%)
5	Collapse consolidation	13(7.5%)
6	Consolidation	4 (2.3%)

Among smokers more than 90% were males in the current study, and these findings were identical to most of the other studies.

Cough was the predominant clinical presentation (83.24%) followed by SOB, hemoptysis, and chest pain. These findings were comparable to findings from other studies conducted by Dubey et al, Thakkar D et al, Bharate et al, Bhadke BB et al, Jindal S.K et al, P.N.Chhajer et al, Dhandapani S et al (14-18,20,23,24). In majority of previous studies by Dubey et al, Thakkar D et al, Bhadke BB et al, Dey A et al, Behera D et al, most frequently observed radiological presentation on imaging was mass and pleural effusions were the next frequent presentation (14,16,18,21,22). This is analogous to present study.

The common histopathology observed was adenocarcinoma followed by squamous cell followed by undifferentiated variety. These results were akin to the studies done by Mohan A et al, Thakkar D et al, Dattatreya SP et al, Dhandapani S et al (15,16,19,24) but in studies by Dubey et al, Bharate et al (14,17), the squamous was observed to be more type was predominant (Table 4). In a study by Mohan A et al in 2016, squamous cell and

adenocarcinoma histology were almost equal in number (25). Among females adenocarcinoma was most common and majority of them were not smokers, which was analogous to a recent study by Mohan A et al: 2020 (15).

Conclusion

Lung cancer was more frequent in elderly patients i.e age >50 years with mean age of presentation in females lower than males. Adenocarcinoma was the predominant histological type in both gender. Smoking is still the primary risk factor for developing lung cancer.

Abbreviations

CT: Computed Tomography ; **ADA:** Adenosine deaminase ; **LDH :** Lactate Dehydrogenase ; **FOB:** Fiberoptic Bronchoscopy ; **FNAC :** Fine Aspiration Cytology; **IHC:** Immune histochemistry; **TTLB:** Transthoracic Lung Biopsy; **SCLN:** Supraclavicular Lymphnode .

Table 4. Histopathological type of various malignancies and comparisons with other studies.

S.NO	Study Name	Adenocarcinoma	Squamous cell	Small cell	Large cell	Undifferentiated
1	Present study (n=173),%	48	35	2.3	0.5	14
2	Chandramouli et al 2021(n=50),%	42	48	-	-	-
3	Ananta Mohan et al 2020 (n=1862)	34	28.6	16.1	-	-
4	Vinod Ramani et al 2020(n=1248), %	70.4	15.3	14.3	-	-
5	Dharitri Takkar et al 2019 (n=50) %	36	32	-	-	-
6	Satya Palanki et al 2019 (n=446)%	66	11.6	2.9	-	15.5
7	Snehal Basan et al 2018 (n= 63)%	66.7	28.5	-	-	-
8	Anjana Das et al 2017(n=295) %	34.58	40	-	-	-
9	Deependra et al 2016 (n=30)%	46.6	16.6	13.3	-	-
10	Mohan et al 2016(n=397) %	28.3	30	14.6	1.7	-
11	Dhandapani et al 2016 (n=54)	42.6	35.18	5.6	-	16.7

References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: a cancer journal for clinicians*. 2018 Nov;68(6):394-424.
2. Mathur P, Sathishkumar K, Chaturvedi M, Das P, Sudarshan KL, Santhappan S, et al. Cancer statistics, 2020: report from national cancer registry programme, India. *JCO Global oncology*. 2020 Jul;6:1063-75.
3. Dar M, Sharma K. Burden of cancer in India: GLOBOCAN 2018 estimates incidence, mortality, prevalence and future projections of cancer in India. *JETIR*. 2019;6:505-14.
4. Valaitis J, Warren S, Gamble D. Increasing incidence of adenocarcinoma of the lung. *Cancer*. 1981 Mar 1;47(5):1042-6.
5. Janssen-Heijnen ML, Coebergh JW. The changing epidemiology of lung cancer in Europe. *Lung cancer*. 2003 Sep 1;41(3):245-58.
6. Thun MJ, Henley SJ, Burns D, Jemal A, Shanks TG, Calle EE. Lung cancer death rates in lifelong nonsmokers. *Journal of the National Cancer Institute*. 2006 May 17;98(10):691-9.
7. Wakelee HA, Chang ET, Gomez SL, Keegan TH, Feskanich D, Clarke CA, et al. Lung cancer incidence in never-smokers. *Journal of clinical oncology: official journal of the American Society of Clinical Oncology*. 2007 Feb 2;25(5):472.
8. Behera D, Balamugesh T. Lung cancer in India. *Indian J Chest Dis Allied Science* 2004; 46: 269. 2012;81.
9. Singh N, Aggarwal AN, Gupta D, Behera D, Jindal SK. Unchanging clinico-epidemiological profile of lung cancer in north India over three decades. *Cancer epidemiology*. 2010 Feb 1;34(1):101-4.
10. Noronha V, Dikshit R, Raut N, Joshi A, Pramesh CS, George K, et al. Epidemiology of lung cancer in India: Focus on the differences between non-smokers and smokers: A single-centre experience. *Indian journal of cancer*. 2012 Jan 1;49(1):74.
11. Malik PS, Sharma MC, Mohanti BK, Shukla NK, Deo SV, Mohan A, et al. Clinico-pathological profile of lung cancer at AIIMS: A changing paradigm in India. *Asian pacific journal of cancer prevention*. 2013;14(1):489-94.
12. Islami F, Torre LA, Jemal A. Global trends of lung cancer mortality and smoking prevalence. *Translational lung cancer research*. 2015 Aug;4(4):327.
13. Parkin DM, Pisani P, Lopez AD, Masuyer E. At least one in seven cases of cancer is caused by smoking. *Global estimates for 1985*. *International journal of cancer*. 1994 Nov 15;59(4):494-504.
14. Dubey N, Arti J, Varudkar H. A clinicopathological profile of primary lung cancer patients presenting in a rural medical College of central India. *Panacea Journal of Medical Sciences*. 2016;5:124-9.
15. Mohan A, Garg A, Gupta A, Sahu S, Choudhari C, Vashistha V, et al. Clinical profile of lung cancer in North India: A 10-year analysis of 1862 patients from a tertiary care center. *Lung India: official organ of Indian Chest Society*. 2020 May;37(3):190.
16. Thakkar D, Damor P, Vithalani K. Clinicopathological profile of patients with bronchogenic carcinoma at a tertiary care center in Western India. *Indian Journal of Respiratory Care*. 2019 Jul 1;8(2):80.
17. Bharate Ramesh Tukaram, D G Mhaisekar, Anil Maske. Clinical profile of lung cancer patients. *MedPulse International Journal of Medicine*. February 2017; 1(2): 54-58.
18. 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(6):1063-71.
19. Dattatreya SP, Bansal R, Vamsy M, Vaniawala S, Nirni SS, Dayal M, Sharma R. Clinicopathological profile of lung cancer at a tertiary care center. *Indian Journal of Cancer*. 2018 Jul 1;55(3):273.
20. Jindal SK, Malik SK, Dhand R, Gujral JS, Malik AK, Datta BN. Bronchogenic carcinoma in Northern India. *Thorax*. 1982 May 1;37(5):343-7.
21. Dey A, Biswas D, Saha SK, Kundu S, Sengupta A. Comparison study of clinicoradiological profile of primary lung cancer cases: An Eastern India experience. *Indian journal of cancer*. 2012 Jan 1;49(1):89.
22. Behera D, Balamugesh T. Lung cancer in India. *Indian J Chest Dis Allied Science* 2004; 46: 269. 2012;81.
23. Chhajed PN, Athavale AU, Shah AC. Clinical and pathological profile of 73 patients with lung carcinoma: is the picture changing?. *The Journal of the Association of Physicians of India*. 1999 May 1;47(5):483-7.
24. 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. *Journal of Cardio-Thoracic Medicine*. 2016;4(2):440-3.
25. Mohan A, Latifi AN, Guleria R. Increasing incidence of adenocarcinoma lung in India: Following the global trend?. *Indian journal of cancer*. 2016 Jan 1;53(1):92.