

# Clinico-Radiological and Pathological Profile of Lung Cancer Patients: An Experience from Tuberculosis and Chest Department of Indira Gandhi Institute of Medical Sciences, Patna: A Tertiary Health Care Centre of Bihar

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## Abstract

**Introduction:** Today, lung cancer is the leading cause of cancer-related morbidity and mortality worldwide. Lung cancer especially shows varied epidemiological, clinico-radiological, and pathological profile. Majority of patients are at advanced stages before reaching to hospital. Lung cancers are growing at fast pace due to smoking habits, especially in Bihar. There are very sparse data of lung cancer patients especially in this part of the world.

**Aim:** This study aims to evaluate the clinico-radiological, demographic, and pathological profile of lung cancer patients reaching to Tuberculosis (TB) and Chest Department of Indira Gandhi Institute of Medical Sciences (IGIMS), Patna, Bihar and to assess the yield of various diagnostic processes used for the diagnosis.

**Materials and Methods:** This is a retrospective observational study done between September 2016 and February 2018 at TB and Chest Department of IGIMS, Patna, Bihar which is a tertiary health-care institute. Around 216 of proven lung cancer patients were enrolled for the study. Their history, clinical details, radiological, pathological, and demographic profiles recorded in the departmental records were analyzed in details using SPSS software.

**Results:** A total of 216 patients were included in our study of which 154 (71.29%) were male and 62 (28.7%) were female. Most patients were in the age bracket 66–75 years (33.88%). Most of the patients belonged to rural background (65.27%). About 71.29% of patients were smokers or former smokers. Adenocarcinoma was the most common histological subtypes documented, i.e., 89 patients (41.20%).

Computed tomography scan and ultrasonography-guided percutaneous biopsy combined was the most common modality of successfully diagnosing lung cancer, in about 25.92%. Majority of patients reached in advanced stage 63.88% among non-small cell lung cancer before arriving to health care facility (in Stage IVA). Mass was the most common radiological diagnosis in about 42.59%.

**Conclusion:** Adenocarcinoma is the leading type of lung cancer found in this study especially in this part of the world. Moreover, there is growing trend of lung cancer among females. Smoking is still the leading cause. Majority of patients reach at an advanced stage before diagnosis. Hence, aggressive approach is needed for earlier diagnosis of lung cancer for timely management.

**Key words:** Clinico-radiological profile, Lung cancer, Patna, Tuberculosis and chest

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## INTRODUCTION

Lung cancers are leading cause of cancer-related deaths (28%) worldwide.<sup>[1]</sup> The clinicopathological profile of lung cancer, its frequency and demographic profile are changing in recent years due to changes in smoking habits and exposure to other source of pollution and occupational exposure.<sup>[2-9]</sup>

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There is increasing prevalence of lung cancer in India and smoking is still the most common causative agent, but there is rising trend of development of adenocarcinoma among non-smokers. Bihar constitutes a large chunk of patients having lung cancer, but there is scarce data available, so we undertook this study to retrospectively analyze the clinico-radiological and pathological profile of lung cancer patients attending the Tuberculosis (TB) and Chest Department in Indira Gandhi Institute of Medical Sciences (IGIMS), Patna, Bihar.

**MATERIALS AND METHODS**

The lung cancer data were collected from the TB and Chest Department, of IGIMS, Patna between September 2016 and February 2018. Only biopsy-proven lung cancer patients were included in this study. Their personal history, demographic profiles, smoking history, symptoms duration, signs and symptoms, radiographic findings, histopathological subtypes, and clinical staging of lung cancer were recorded in detail. Only patients with biopsy and histopathologically confirmed lung cancer were included in the study.

**Exclusion Criteria**

1. Age <25 years.
2. Patients with secondary lung cancer, lymphoma, sarcoma, malignant pleural effusion of unknown primary or non-pulmonary site, and other rare varieties were excluded from this study.
3. Patient not willing to undergo various diagnostic and interventional procedures.

Routine hematological examinations, sputum for malignant cytology, chest radiology including computed tomography (CT) thorax were done of nearly all patients. However, CT scan of abdomen, brain, or other parts of the body were done in selected cases as per requirement due to economic constraints. CT/ultrasound guided fine-needle aspiration cytology (FNAC)/biopsy, pleural fluid malignant cytology were done where indicated. Fiber optic bronchoscopy (FOB) was done in selected patients where indicated and biopsy and bronchial aspirate taken. Lymph node biopsy was also taken where indicated. Thoracoscopic biopsy could not be done due to unavailability of the instruments in our institute.

**RESULTS**

A total of 216 histopathologically proven cases of lung cancer were analyzed between September 2016 and February 2018. Most of the patients were in the age group of 66–75 years (34.25%) [Table 1].

Non-small cell lung carcinoma (NSCLC) were diagnosed in 180 patients (83.33%), where as small-cell lung carcinoma (SCLC) in 36 patients (16.66%). Majority were male

**Table 1: Clinicopathological and demographic profile of lung cancer patients**

Feature	NSCLC n=180 (%)	SCLC n=36 (%)
Age		
<45	6 (3.33)	0
45–55	26 (14.44)	3 (8.33)
56–65	45 (25)	9 (25)
66–75	61 (33.88)	13 (36.11)
>75	42 (23.33)	11 (30.55)
Sex		
Male	126 (70)	28 (77.77)
Female	54 (30)	8 (22.22)
Occupation		
Farmer	74 (41.11)	14 (38.88)
Household worker	19 (10.55)	6 (16.66)
Laborer	51 (28.33)	9 (25)
Office goers	36 (20)	7 (19.44)
Geographical distribution		
Urban	67 (37.22)	8 (22.22)
Rural	113 (62.77)	28 (77.77)
Smoking history		
Smoker	102 (56.66)	29 (80.55)
Non-smoker	58 (32.22)	4 (11.11)
Former smoker	20 (11.11)	3 (8.33)
Type of smoking		
Bidi	124 (68.88)	29 (80.55)
Cigarette	49 (27.22)	4 (11.11)
Hukka, Biomass fuel	7 (3.88)	3 (8.33)
Carcinoma subtypes		
SCC	58 (32.22)	
Adenocarcinoma	89 (49.44)	
Large cell carcinoma	2 (1.11)	
Poorly differentiated carcinoma	31 (17.22)	
Small-cell carcinoma		36 (100)
Mode of diagnosis		
FOB/BAL	56 (31.11)	8 (22.22)
CT-guided percutaneous	42 (23.33)	14 (38.88)
FNAC USG-guided	27 (15)	10 (27.77)
percutaneous		
FNAC/Tru cut biopsy	21 (11.66)	2 (5.55)
Pleural fluid cytology	21 (11.66)	2 (5.55)
Lymph node biopsy	25 (13.88)	2 (5.55)
Sputum malignant	8 (4.44)	1 (2.77)
cytology		
AJCC staging (8 <sup>th</sup> ed..ition)		
IA	0	
IB	0	
IIA	0	
IIB	2 (1.11)	
IIIA	9 (5)	
IIIB	16 (8.88)	
IIIC	23 (12.77)	
IVA	115 (63.88)	
IVB	9 (5)	
NS	6 (3.33)	
Limited		7 (19.44)
Extensive		29 (80.55)

NSCLC: Non-small cell lung carcinoma, SCLC: Small-cell lung carcinoma, FNAC: Fine-needle aspiration cytology, USG: Ultrasonography, SCC: Squamous cell carcinoma, FOB: Fiber optic bronchoscopy, CT: Computed tomography, AJCC: American Joint Committee on Cancer

154 (71.29%), females were 62 (28.70%) in totality. One hundred twenty-six (70%) of males were having NSCLC out of 180 cases, whereas 28 (77.77%) were males in SCLC group of 36. Among the occupation, farmers (40.74%) were the most vulnerable group to develop lung carcinoma probably due to smoking habits. Patients from rural areas (65.27%) were mostly diagnosed with lung carcinoma as compared to urban group (34.72%). Active smoking history was present in 131 cases (60.66%) whereas 23 (10.64%) were former smokers. Hence, smoking was still the most common cause of lung cancer in this study. Bidi smoking was the most common cause in 153 (70.83%). Adenocarcinoma was the most common subtype identified in 89 patients (49.44%) among NSCLC in the present study surpassing squamous cell carcinoma (SCC) as per national average. This may be due to growing incidence of adenocarcinoma in non-smokers in this region. CT and ultrasonography (USG)-guided biopsy combined were the most common modality of diagnosis in 93 (43.05%) whereas FOB was diagnostic in 64 patients (29.62%). Most of the NSCLC 115 (63.88%) were of the American Joint Committee on Cancer (AJCC) stage (8<sup>th</sup> edition)

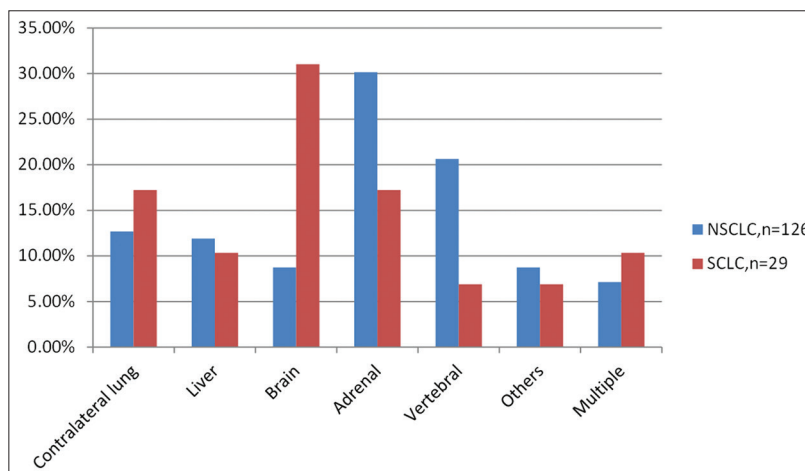
IVA whereas SCLC was of extensive stage in 29 patients (80.55%). Most of the patients had metastasis to different organs during evaluation 155 (71.75%) with adrenals being the most common organ to be metastasized in 43 (27.74%). Multiple metastasis was seen more commonly in SCLC 10.34% as compared to NSCLC in 7.14% [Graph: 1].

Most common symptoms were weight loss 189 (87.5%) followed by a cough 113 (52.31%). Most common clinical examination findings were pallor 78 (36.11%) whereas superior vena cava obstruction (SVC) was found in 27 (12.5%) [Graph 2 and Table 2].

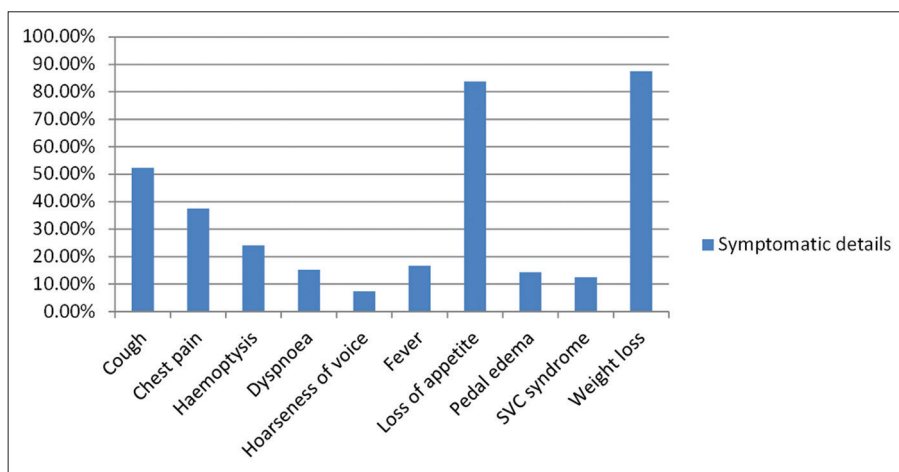
Among radiological distribution, right lung was involved more commonly in 113 (52.31%) and mass was most common finding on radiology in 92 (42.59%) [Table 3].

## DISCUSSION

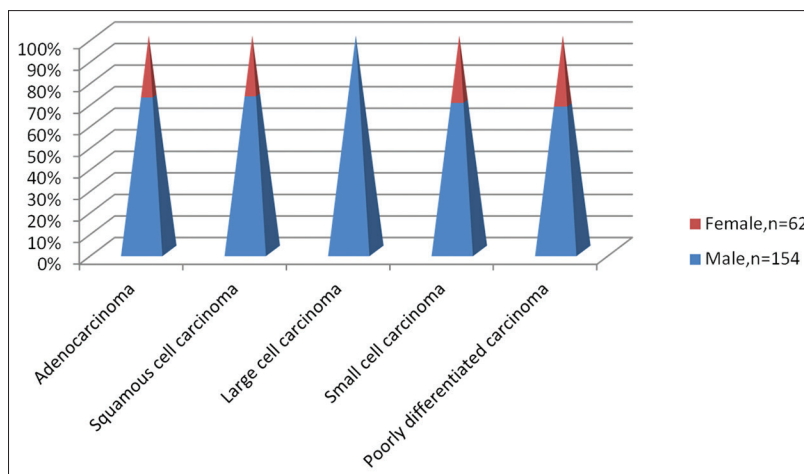
Our study represents the clinical, radiological, demographic, and histopathological profile of lung cancer patients



Graph 1: Metastatic details



Graph 2: Symptomatic details



**Graph 3: Lung carcinoma distribution among different sex**

**Table 2: Distribution according to clinical examination findings**

Findings	Number of patients (%)
Pallor	78 (36.11)
Clubbing	54 (25)
Cyanosis	24 (11.11)
Peripheral lymphadenopathy	42 (19.44)
SVC obstruction	27 (12.5)

SVC: Superior vena cava obstruction

**Table 3: Radiological lesion distribution**

Radiological lesion	Number of patients n=216 (%)
Bilateral	22 (10.18)
Right lung	113 (52.31)
Left lung	81 (37.5)
Mass	92 (42.59)
Mass with effusion	41 (18.98)
Effusion	32 (14.81)
Coin shadow	13 (6.01)
Mass with collapse/consolidation	26 (12.03)
Hydropneumothorax	5 (2.31)
Cavity	7 (3.24)

presenting to TB and Chest Department, in IGIMS, Patna, a tertiary health-care center from different parts of Bihar and adjoining states including Nepal. Most of the patients were diagnosed falsely having pulmonary TB and were taking antituberculous therapy in the peripheral health center. That leads to patients being diagnosed late and arriving at our center in advanced stage. Most of the patients fall into higher age group (>56 years) with Non small cell lung cancer (NSCLC) comprising 68.51% and Small cell lung cancer (SCLC) 15.27% in this age group. In different studies from west as well as from India, it is reported that 50%–70% cases of NSCLC and up to two-third of SCLC usually present in advanced stage.<sup>[10,11]</sup>

Male-female ratio constitutes about 2.4:1 which appears to be slightly lower than most of the studies from

India and abroad.<sup>[2,7,12,13]</sup> This may be due to growing incidence of adenocarcinoma in female non-smoker. Smoking is associated with most of the lung cancer cases. In present study, bidi smoking, a form of unfiltered tobacco smoke was associated with a large number of NSCLC, i.e, 56.66% and SCLC in 80.55%, especially in rural background. Previous Indian series have shown that majority of patients with lung cancer were bidi smokers.<sup>[13-15]</sup> This may be due to growing awareness about the smoking hazard and anti-smoking campaign in urban areas leading to less number of lung cancer cases among them. The risk of lung cancer in former smoker remains high than never-smoker even after >40 years of abstinence.<sup>[2]</sup>

In our study, lung cancer was found in former smokers in 11.11% in NSCLC and in 8.33% in small-cell lung cancer (SCLC). There has been a shift of histological profile towards adenocarcinoma worldwide these days.<sup>[16-18]</sup>

In our study also, adenocarcinoma was the predominant subtype in 49.44% among NSCLC with females constituting 28.08%. Poorly differentiated carcinoma was found in 31 (17.22%) [Graph 3]. This is due to lack of immunohistochemistry available in our institute and also financial constraints. Most of the patients were in an advanced stage in our study with stage IVA according to AJCC 8<sup>th</sup> edition constituting 63.88% among NSCLC and extensive stage 80.55% in SCLC.

As positron emission tomography scan, mediastinoscopy thoracoscopy was not available and in our institutes and also due to financial constraints, we could not go for extensive investigations. CT/USG-guided FNAC/biopsy was the most common modality of diagnosis followed by FOB in our study as former is easy and relatively cheap and safe. We could diagnose lung cancer by sputum examination only in 8 patients in NSCLC and 1 patient

in SCLC. Although outcome of sputum examination is low this test is recommended in patients since this is a very easy and cost-effective. Most of the patients had metastasis to different organs with the involvement of adrenal being most common, i.e., 30.15% in NSCLC and 17.42% in SCLC. Among symptoms, weight loss and persistent cough were the most common symptoms followed by anorexia and hemoptysis. Pallor followed by clubbing was found most commonly in clinical examinations. SVC syndrome was found in 12.5% cases. Among radiological findings right lung was more commonly involved 52.31% and mass was the most common finding 42.59%. Adenocarcinoma commonly manifested peripherally in radiology or as a malignant pleural effusion as were also reported in other studies.<sup>[19,20]</sup> The SCLC and SCC presented commonly as central lesion as in other studies.<sup>[19,21,22]</sup> Actually, real number of patients of lung cancer are much higher than what appears in this study due to patients not attending the hospitals and also underreporting of cases. Furthermore, most cases of cough and hemoptysis are being treated under the assumption of exacerbation of chronic obstructive pulmonary disease (COPD) or pulmonary tuberculosis (TD) thereby negating the patients of timely intervention.

## CONCLUSION

This study signifies that smoking is the principal risk factor of lung carcinoma. Adenocarcinoma appears to be the most common type of lung cancer in this region. There is growing trend of female lung cancer patients which need further studies to find out the etiological factors responsible. Lung cancer patients present with some specific sign and symptoms which mimics with TB or COPD leading to patients presenting late to the specialized centers. Hence, every effort is needed to find out the etiology, prevent the risk factors, to diagnose early and treat effectively so that patients can lead a comfortable life.

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