

## A clinico-radiological and pathological profile of lung cancer patients presented to All India Institute of Medical Sciences (Patna)

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### ABSTRACT

**Background:** Lung cancer is one of the most common cancers and cause of cancer-related deaths worldwide. The clinico-pathological profile of lung cancer has shown marked regional and geographical variation. Majority of the patients have locally advanced or disseminated disease at presentation and are not candidates for surgery. **Objective:** The aim of this study was to evaluate the clinico-radiological and pathological profile of lung cancer patients and difference in histopathology between smoker and non-smoker. We also assessed yield of the various diagnostic procedures used for confirmation of lung cancer. **Materials and Methods:** A total of 30 patients diagnosed between May 1, 2016, and December 31, 2016. The complete demographic profile, smoking status, clinical, radiological, and diagnostic details were recorded in the study. Data were entered and analyzed using SPSS software. **Results:** A total of 30 patients (19 male and 11 female) included in our study with mean age of 55.26 years. Cough (80%) and dyspnea (80%) were the most common symptom and mass (86%), pleural effusion (53.3%) was the most common radiological presentation of patients. Clubbing and hemoptysis both was found only in 8 out of 30 (26%) patients. Adenocarcinoma (46.6%) was the most common histopathological type followed by squamous cell carcinoma (16.6%) and small cell carcinoma (13.3%). The majority of patients (60%) presented in Stage 4. Computed tomography guided biopsy had better yield in compare to ultrasonography guided (80% vs. 70.8%). Bronchoscopic procedure had lowest yield (38.8%). **Conclusion:** The clinicopathological profile of lung cancer has changed in last few years, especially in the increase in adenocarcinoma incidence, and now it is the most common cause in both smokers and non-smoker.

**Key words:** Adenocarcinoma, Lung cancer, Pleural effusion, Smoking

Lung cancer remains the most lethal form of cancer in men and has now surpassed breast cancer in women. It is responsible for 28% of all the cancer-related deaths [1]. In the developed countries, incidence and mortality from lung cancer in females is rising, whereas it is declining in males. The worldwide incidence is 14% whereas it constitutes 6.8% of all cancers in India [2]. In our country, it is responsible for 6% of total deaths, in males it accounts for 78.8 deaths/lakh population and in females 71.8 deaths/lakh population. In addition to smoking, occupational exposure to carcinogens, indoor air pollution, and dietary factors have been included in causation of lung cancer. Primary lung cancers, which originate in the lungs, are divided into two main types; small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC). NSCLC, approximately 80% of lung cancer diagnoses. There are three types of NSCLC, namely, squamous cell carcinoma, adenocarcinoma and large cell carcinoma. Squamous cell carcinoma is still the commonest histological type in India in contrast to the Western countries although adenocarcinoma is becoming more common [3].

Various invasive and non-invasive investigations are available for evaluation of lung cancer, e.g., chest X-ray, computed tomography (CT) thorax, fine needle aspiration cytology (FNAC),

bronchoscopy, positron emission tomography (PET) scan, and magnetic resonance imaging. Most of the patients have locally advanced or disseminated disease at presentation and are not candidates for surgery. Chemotherapy applied as an adjunct with radiation improves survival and the quality of life. New anticancer drugs, which have emerged during the last decade, have shown an improved efficacy-toxicity ratio.

This study is designed to evaluate the epidemiological, clinico-pathological aspects of lung cancer.

### Aims and Objectives

#### Primary

1. To study the clinico-radiological and pathological profile of lung cancer patients
2. Stage of presentation of lung cancer.

#### Secondary

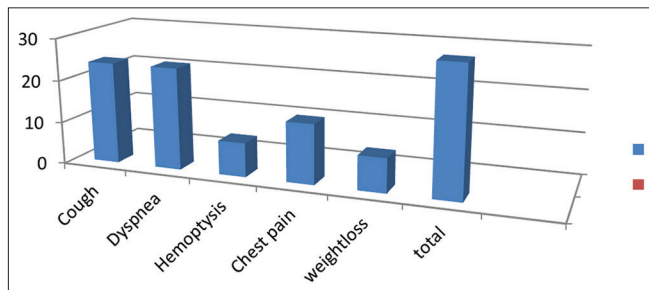
1. To Measure yield of diagnostic modalities used in lung cancer
2. Histological differences of lung cancer between smoker and non-smoker patients.

**MATERIALS AND METHODS**

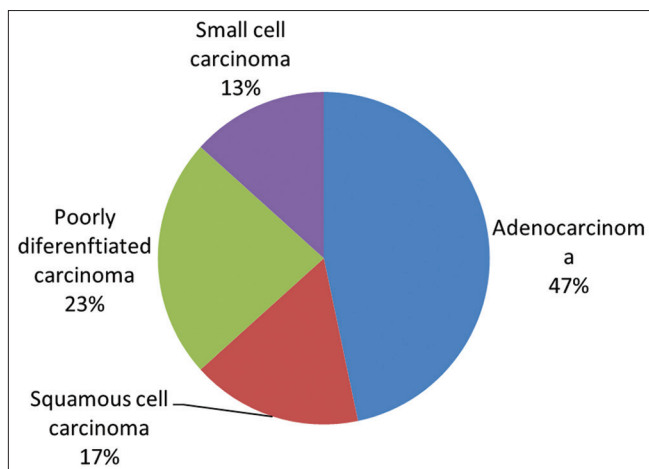
This was a retrospective analysis of all the patients diagnosed with lung cancer in the Department of Pulmonary Medicine, All India Institute of Medical Sciences, Patna between May 1, 2016, and December 31, 2016. Complete demographic profile, smoking status, clinical, radiological and diagnostic details were recorded in the study. Staging was done according to the 6<sup>th</sup> edition of American Joint Committee on Cancer staging system based on the available clinical and radiological findings. Age cutoff (40 years) was accepted as the limit to differentiate younger from older patients. Diagnostic modalities were recorded, including fibrotic bronchoscopy and/or ultrasonography (USG), or CT guided tissue sampling from suspected pulmonary lesion, pleural fluid analysis and cytological examination of regional lymph nodes and metastatic deposits as appropriate. CT scan of the thorax was done in the majority of cases. CT scan of the abdomen, brain or other parts of the body, bone scan, and PET-CT scan were done as per clinical indication for diagnostic or staging purposes.

**Definition [4]**

- Non-smoker: Person who had never smoked or had smoked <20 cigarettes in his or her lifetime.
- Smoker: Smoked ever in their life more than just occasional smoking as “smoker.”
- Study duration: 8 months.



**Figure 1: Prevalence of symptoms in lung cancer (number on Y axis represent number of study patients)**



**Figure 2: Distribution of histological type of lung cancer**

**Inclusion Criteria**

Only those cases with a confirmed histological or cytological diagnosis of primary bronchogenic carcinoma were included.

**Exclusion Criteria**

Patient with primary mediastinal mass, primary pleural mass. Lymphoproliferative disorder or patient already received treatment for lung cancer.

**Statistical Analysis**

All the data were entered and analyzed using SPSS software (SPSS Inc., Released 2009. PASW Statistics for Windows, Version 18.0, SPSS Inc., Chicago, IL, USA).

**RESULTS**

A total of 30 patients diagnosed with lung cancer in pulmonary medicine department between May and December 2016, which comprises 19 male and 11 female. There were 60% patients belonged to age between 40 and 60 years. The average age of study patients was 55.26 years. Out of 30 patients, 16 patients are smoker and most of them are bidi smoker (30%) (Table 1). When we look for clinical symptoms, cough (80%) and dyspnea (80%) were the most common symptom found followed by anorexia and hemoptysis (Table 2 and Figure 1). On examination, pleural effusion was the most common finding (40%). Clubbing was present in only 8 patients (26%). Radiological examination shows mass was most common finding (86%) followed by pleural effusion (Table 2). Most of the patients (60%) presented in very advanced stage (Table 3).

NSCLC was diagnosed in 26 (86.6%) patients while 4 (13.3%) patients had SCLC. The most common histopathological type found was adenocarcinoma (46.6%) followed by squamous cell carcinoma (16.6%). Adenocarcinoma was most common histopathological type in non-smoker. In non-smoker,

**Table 1: Basic characteristics of patients**

Characteristic	Total (n=30) (%)
Gender	
Male	19 (63.3)
Female	11 (36.6)
Age (years)	
<50	4 (13.3)
40-60	18 (60.0)
>60	8 (26.6)
Mean age (years)	55.26
Smoker	16 (53.33)
Bidi: cigarette: hukka	12:2:2 (75:12:12)
Mean duration of smoking (years)	13.69
Mean total duration of illness (month)	4.8

adenocarcinoma and squamous cell carcinoma are equally prevalent (Table 4 and Figure 2). Among diagnostic modalities, CT guided biopsy had better yield in compare to USG guided sample (80% vs. 70%). Bronchoscopic procedure had lowest yield (38.8%) (Table 5).

## DISCUSSION

In this study, the maximum incidence of lung cancer was found in the 40-60 years age group with mean age of 55.3 years similar to previous studies [1-4]. These studies show only 13.3% patients belong to age group <40 years. The male to female ratio was 4.3:1, which is similar to other Indian studies [5,6]. The reports

from Indian cancer registry a ratio varying from 2.6:1 to 7.0:1 in different regions [6]. Gupta et al. [7] in their study also reported a higher incidence in females <40 years old, with a ratio of male to female patients was 1.7:1. These studies show female predominance may be due to small sample size and also due to increased susceptibility to carcinogens. Among risk factors, smoking was the commonest risk factor in which bidi was used by most of the patients followed by cigarette and hukka [8-10]. In this study, smoker to the non-smoker ratio was found to be 1.7:1.0. In other studies [11], range of this ratio was varies from 1.9:1 to 5.3:1. Adenocarcinoma was the most common histology found followed by squamous cell carcinoma and small cell carcinoma. Our finding supported by many Asian and western studies which show that adenocarcinoma was more common histological type than squamous cell carcinoma [12,13]. This shift might be attributable partly to the smoking habits, particularly filtered cigarettes; moreover, there is also increasing the incidence of lung cancer in females and non-smokers [14]. It was also shown that adenocarcinoma was the most common histology in both smoker and non-smoker. Older Indian studies [15] have described squamous cell carcinoma as the commonest histology, but some recent studies from two major centers are showing a changing pattern in India [16,17]. This study also shows that mass was the most common radiological presentation followed by pleural effusion which is similar to other studies [18]. Pleural effusion more common in our studies which may be due to more number of adenocarcinoma patients. The bronchoscopic procedure most commonly performed for centrally located tumor in compare to peripheral located tumor where CT or USG guided FNAC and biopsy selected. In the present studies, USG guided FNAC was performed more than bronchoscopy. This study shows highest yield by CT guided biopsy in compare to USG guided sample with no complication; other studies have similar finding [19]. The bronchoscopic procedure had lowest yield in these studies and this may be due to more number of peripheral located tumor.

## CONCLUSION

The clinico-pathological profile of lung cancer has changed in last few years and especially in the increase in adenocarcinoma incidence, and now it is the most common cause in both smokers and non-smoker. The bronchoscopic procedure is the most common procedure performed for centrally located tumor in compare to peripheral located tumor. Imaging-guided FNAC procedure have been performed.

**Table 2: Clinical-radiological presentation of study patients**

Symptoms	Total n=30 (%)	Mean duration (month)
Cough	24 (dry in 8) (80.0)	2.4
Chest pain	14 (46.6)	1.0
Dyspnea	24 (80.0)	3.0
Hemoptysis	8 (26.6)	1.5
Weight loss	18 (60.0)	-
Hoarseness of voice	8 (26.6)	1.2
Examination		
Clubbing	8 (26.6)	
Peripheral lymphadenopathy	06 (20.0)	
SVC syndrome	4 (13.3)	
Pleural effusion	12 (40)	
Radiological presentation		
Pleural effusion	16 (53.3)	
Collapse-consolidation	6 (20.0)	
Mass	26 (86.6)	
Mediastinal lymphadenopathy	12 (40)	

SVC: Superior vena cava

**Table 3: Stage-wise presentation of study patients**

TNM stage	Total n=30 (%)
Stage 1	0 (0)
Stage 2	0 (0)
Stage 3A	2 (0.06)
Stage 3B	10 (33.33)
Stage 4	18 (60)

TNM: Tumor node metastasis

**Table 4: Histopathological distribution in smoker and non-smoker**

Histological type	Histopathological type	Total 30 (100%)	Smoker 16 (53.33%)	Non-smoker 14 (46.66%)
NSCLC 26 (86.6%)	Adenocarcinoma	14 (46.6)	5	9
	Squamous cell Ca	5 (16.6)	3	2
	Poorly differentiated Ca	7 (23.3)	5	2
SCLC 4 (13.3%)	Small cell Ca	4 (13.3)	3	1

NSCLC: Non-small cell lung cancer, SCLC: Small cell lung cancer

**Table 5: Diagnostic yield for different diagnostic modalities**

Procedure	Total	Positive	Percentage
USG guided FNAC	24	17	70.83
CT guided biopsy	15	12	80.0
FOB-endobronchial biopsy	18	7	38.88

US: Ultrasonography, CT: Computed tomography, FNAC: Fine needle aspiration cytology, FOB: Fiberoptic bronchoscopy

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