## Original Article

# Clinicoradiopathological Profile of Lung Cancer in A Tertiary care hospital

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**ABSTRACT**

**Introduction :** Lung cancer is the largest contributor to new cancer diagnoses worldwide, presently 12.4% of total new cancer cases and cause more death than three common cancer combined - breast, colon & prostate cancer. Patients clinically presents with symptoms of cough, hemoptysis, hoarseness of voice, breathlessness etc. Varied radiological presentation is known but again no picture confirms underlying malignancy. Early diagnosis in any cancer is necessary and for this, understanding these presentations is important hence this study is undertaken.

**Aims & Objectives :**

*Primary* - To study Clinico- radiological presentation of lung cancer.

*Secondary* - 1. To study various pathological types of lung cancer.
2. To study about the diagnostic yield of various diagnostic modalities

**Material & methods :** Retrospective observational analysis of 65 confirmed cases of lung cancer admitted to respiratory medicine ward during 1st July 2015 to 30th June 2017. Results were analysed to find correlation between clinical, radiological and pathological picture

**Results :** Most common respiratory symptom was cough (86%) followed by dyspnea (75%), chest pain (46%), hemoptysis (12%), hoarseness of voice (11.6%) and fever (5%). Over treatment as case of tuberculosis was seen in 20.69 % cases due to overlapping clinical & radiological presentation. CT guided biopsy / FNAC was most useful investigation followed by pleural fluid Cytology, pleural biopsy, bronchoscopy & aspiration cytology of draining lymph node in order.

**Conclusion :** Males are commonly affected and adenocarcinoma is the commonest malignancy among all cases & in nonsmokers. Squamous cell carcinoma is commonest among smokers. Our study strengthens association of smoking & lung cancer and cough as a symptom needs thorough assessment.

**Key words :** Lung cancer, Smoking, Radiology of lung cancer, Adenocarcinoma.

## Introduction :

Globally, Lung cancer is the largest contributor to new cancer diagnoses (1,350,000 new cases and 12.4% of total new cancer cases) and to death from cancer (1,180,000 deaths and 17.6% of total cancer deaths[1]. Lung cancer is one of the commonest malignancy and leading cause of cancer related deaths world wide[2]. Smoking is the cause for more than 85% of the bronchogenic carcinoma cases[4]. The risk for lung cancer increases with the duration of smoking and the number of cigarettes smoked per day[3]. Historical trends indicate that cigarette smoking prevalence peaked about two decades earlier in men than in women; thus, the epidemic of lung cancer started later in women[5]. In India, lung cancer has been considered as a less frequent entity[6], but an increased rate of diagnosis of lung cancer was done in the early 1960s by Viswanathan et al[7]. The various symptoms like cough, dyspnea, chest pain and hemoptysis are common to multiple chest conditions and alone are not diagnostic of any particular disease. However correlation between various symptoms and radiological picture may support suspicion of Carcinoma lung and guide us to appropriate investigation to confirm diagnosis[17]

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**Aims & Objectives :**

*Primary -* To study clinico - radiological presentation of lung cancer.

*Secondary -*

1. To study various pathological types of lung cancer.

2. To study about the diagnostic yield of various diagnostic modalities

**Material & methods :**

This was retrospective observational analysis of 65 confirmed cases of lung cancer admitted to respiratory medicine wards during 1st July 2015 to 20th June 2017. The clinical records of the patients were analysed for the demographic data, smoking habits, duration of symptoms & signs, radiographic findings and histopathology of lung cancer. Diagnostic Procedures were performed as per standard guidelines to confirm diagnosis. Only results were analysed to find correlation between clinical, pathological and radiological picture & no additional intervention performed during our study.

**Result :**

Of the 65 patients diagnosed to have Lung cancer, majority of patients were male 43 (66.15%) & 22 (33%) were females with Male : Female ratio was 1.9:1. *(Figure 1)*

*Figure 1 :* **Bar graph showing histological sub types of cancer in relation to sex**
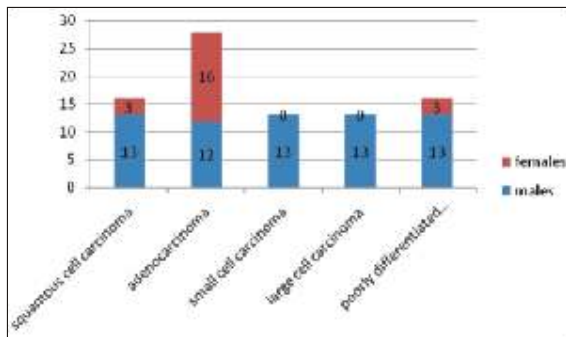


Majority was smokers 36 (55%) & 29 (44.6%) were non-smokers. Smokers to Non-smokers ratio are 1.2:1. Average duration of smoking was 26.22 pack years in smokers. Most common symptom was cough (86%) followed by dyspnea (75%),chest pain

(46%), hemoptysis (12%), hoarseness of voice (11.6%) and fever (5%). Most of the patients were above the age of 60 (45%), however 20 (30%) of cases were below 60. 20.69% patients were diagnosed as tubercular & over treated with anti TB drugs before being diagnosed as malignancy.

*Table 1 :* **Table showing the commonest symptoms the primary and metastatic lung cancers present with**

| Sr. No. | Symptoms | Presentation |
|---------|----------|--------------|
| 1 | Cough | 86% |
| 2 | Dyspnea | 75% |
| 3 | Chest pain | 46% |
| 4 | Hemoptysis | 12% |
| 5 | Hoarseness of voice | 11.6% |
| 6 | Fever | 5% |

Among all cases, (46%) of the malignancies presented as mass radiologically, consolidation (21.5%), both pleural effusion and mass in 20%, as gross pleural effusion alone in 9%, cavitatory nodules seen in 6% and 4% presented with Lymphangitis carcinomatosis. *(Table 2)*

*Table 2 :* **Table showing various radiological presentations**

| Sr. No. | Radiological findings | Presentation |
|---------|----------------------|--------------|
| 1. | Mass | 46% |
| 2. | Consolidation | 21.5% |
| 3. | Effusion & mass | 20% |
| 4. | Gross effusion | 9% |
| 5. | Nodular cavitatory | 6% |
| 6. | Lymphangitis carcinomatosa | 4.6% |

Among various cell types, Adenocarcinoma was the commonest histological subtype (43%), followed by Squamous cell carcinoma (25%), Poorly differentiated epithelial malignancy (15%), Small cell carcinoma (9.2%), Metastatic malignancies (5%), Large cell (3%), (3%) Thymoma eroding in to the bronchus. *(Figure 2)*

Squamous cell carcinoma was the commonest in smokers (81.25%) while adenocarcinoma was commonest in non smokers (71.4%) *(Table 3)*

*Table 3 :* **Table showing association of smoking with the lung cancer**

| Types | Smokers | Non smokers | Total |
|---|---|---|---|
| Squamous cell carcinoma | 81.25% | 18.7% | 16 |
| adenocarcinoma | 28.5% | 71.4% | 28 |
| Small cell carcinoma | 66.67% | 33% | 6 |
| Poorly differentiated epithelial malignancy | 80% | 20% | 10 |
| Thymoma eroding in to the bronchus | 50% | 50% | 2 |
| Large cell carcinoma | 50% | 50% | 2 |

Squamous cell carcinoma was the most common histological sub type in males (30.23%); Adenocarcinoma was the commonest subtype in females (72.7%).

Bronchoscopy was done for the suspected endobronchial mass, USG and CT guided FNAC was preferred for peripherally located lesions. Out of 23 cases that underwent Bronchoscopy 19 (82%) were positive for malignancy while out of 24 patients who underwent image guided FNAC 22 (91.6%) came out to be positive for malignancy. The patients who presented with pleural effusions, pleural fluid cytology, cellblock or pleural biopsy were done. Cytology was positive in 10 (52.6%) out of 19 patients, pleural biopsy was positive for malignancy in all the 3 (100%) who underwent the procedure. FNAC of the draining lymph nodes was positive in 11 (84.6%) out of 13 cases *(Table 4)*

Complications like Vocal cord palsy was seen in (11.6%), Skeletal metastasis was found in (8.3%), Pericardial effusion, and Adrenal metastasis in (5%) each, SVC syndrome (4.6%) was already present when cases presented to us. *(Figure 2)*

*Figure 2 :* **Pie diagram showing the complications associated with lung malignancy**
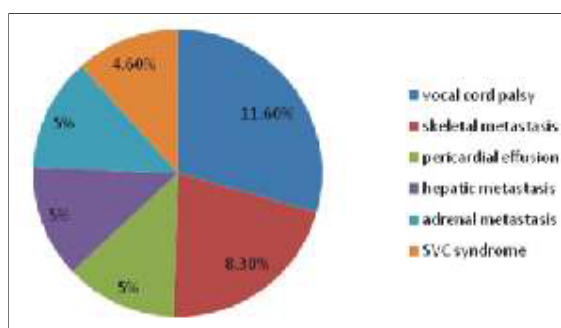


**Discussion :**

In our study majority of patients (69%) were above the age of 60 years consistent with the previous studies[3] though reports of lung malignancy in younger age group are increasing.

Adenocarcinoma was found to be the commonest lung cancer among females (57%), Squamous cell carcinoma was the commonest in males (81%), and other entities like small cell carcinoma, and large cell carcinoma was exclusively found in males. Wakelee et al also note that the proportion of lung

*Table 4 :* **Table showing the yield of various diagnostic modalities**

| Sr. No. | Procedure performed | No of patients underwent the procedure | Positive for malignancy |
|---|---|---|---|
| 1 | Bronchoscopic biopsy | 23 | 19 (82%) |
| 2 | USG and CT guided FNAC | 24 | 22 (91.6) |
| 3 | Pleural fluid cytology | 19 | 10 (52.6%) |
| 4 | Pleural biopsy | 3 | 3 (100%) |
| 5 | FNAC of the draining lymph node | 13 | 11 (84.6%) |

cancers that are adenocarcinoma is highest among male and female lifelong nonsmokers, intermediate in former smokers, and lowest in current smokers[19]

Most common symptom was cough (86%) followed by dyspnea (75%), chest pain (46%), hemoptysis (12%), hoarseness of voice (11.6%) and fever (5%) consistent with the previous studies[1]

Majority (46%) of the malignancies presented as mass and (21.5%) as consolidation radiologically, both pleural effusion and mass in (20%), as gross pleural effusion (9%), cavitatorynodules (6%) and (4.6%) presented with Lymphangitis Carcinomatosa. In the study conducted by Behra et al, the commonest presentation was mass lesion with or without collapse in (68%)[18], (20.69%) of cases were diagnosed as tuberculosis and were given Anti Tuberculosis treatment. VK Singh et al conducted a study on misdiagnosis of lung cancer as tuberculosis and found out that a total of 14 out of 70 (20%) cases of lung cancer had received ATT for varying durations since onset of chest symptoms[17].

Overall adenocarcinoma (43%) was the commonest histological variant in our study. However Squamous cell carcinoma was the commonest histological variety seen in smokers (81.25%) and adenocarcinoma was the commonest among non smokers (71.4%) Though adenocarcinoma is more common in non-smokers, recent data suggests that adenocarcinoma is also becoming more common in smokers[6]. Mehak et al studied 59 patients who had non-small cell; the maximum number of patients had squamous cell carcinoma (56%) followed by adenocarcinoma (42.4%). However recent study in Tata Memorial Hospital by V Noronha, R Dikshit (2012), showed adenocarcinoma as a most common subtype found in 43.8% followed by squamous cell carcinoma 26.2%[15].The shift in the incidence of squamous cell carcinoma to adenocarcinoma may be associated with the switch from non-filtered to filtered cigarettes and the depth of inhalation had been altered. Smoke from filtered milder cigarettes may be more deeply inhaled that result in deposition of carcinogen more peripherally, giving rise to adenocarcinomas[10]. However in our study squamous cell carcinoma is still the commonest in smokers.

Bronchoscopy is the most useful investigation in the evaluation of the patient suspected of endobronchial lesion. The diagnostic yield of bronchoscopic sampling procedures like brushings, cytology and biopsy were dependent on the location of the tumor. Bronchioloalveolar cell carcinoma (BAC) is a sub type of adenocarcinoma that can be discerned as a lung mass or nodule or as a pulmonary infiltrate. Endobronchial mass lesions are not usually present at bronchoscopy in these patients; however, bronchial brushings, bronchoalveolar lavage and trans-bronchial biopsy are useful in making the diagnosis[11]. In our study 19 (82%) of the 23 who underwent bronchoscopy were diagnosed with malignancy and 4 (14.2%) of 28 cases of adenocarcinoma had BAC. Vijeta et al in their studies found out that Sensitivity of BAL was 47.61% and of BB was 65.07%; it was highest for FNAC at 88.88% (16).

FNAB done under image guidance is the investigation of choice for peripherally situated lesions[4], in our study lung malignancy was diagnosed in (95%) of who underwent USG or CT guided FNAC. Also pleural biopsy was performed in 3patients with pleural effusion, all the 3 were diagnosed with malignancy. Hence even closed pleural biopsy aids in the diagnosis of malignant pleural effusion and give the definite histological diagnosis in patients with indeterminate cytology. It is also a cost-effective and safe procedure[12]. FNAC of the draining lymph nodes is equally important for which the yield was (84.6%) in our study. It signifies the importance of thorough clinical examination of the patients.

Complications like Vocal cord palsy (11.6%), Skeletal metastasis (8.3%), Pericardial effusion, hepatic metastasis and Adrenal metastasis with (5%) each & Superior vena cava syndrome (4.6%) was found. Similar observation was reported by Behra and Balamugesh (2004) in their study[18].

**Conclusion :**

Males are commonly affected with lung malignancy however, women are at risk too . SCC is commonest cancer among the smokers. Adenocarcinoma are the most common malignancy among all cases & in

nonsmokers. Though tobacco smoking is the most common modifiable risk factor for lung cancer. Our study strengthens epidemiological association of smoking and lung cancer it also brings forth occurrence of lung cancers in nonsmoking females too. Also underlines varied clinical, radiological and pathological presentation as per current trends in central India.

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