

Clinical profile of lung cancer in rural medical college of Maharashtra (India): a prospective study of three years

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Abstract

Aim: To Study the clinical, radiological & histological profile of lung cancer. **Material & Methods:** 94 patients who presented with cough, haemoptysis, chest pain, breathelessness, and having radiological features consistent with bronchogenic carcinoma subjected to sputum cytology, bronchoscopy, CT thorax & FNAB depending on need. **Results :** Highest incidence of lung malignancy was found in age group of 51-70 years (35.10%). Male : female ratio was 3:1. 54 (57.44%) were smokers & 40 (42.55%) were non-smokers. Cough (88.33%), breathelessness (85%) and chest pain (48.33%) were the commonest presentation . Sputum cytology was positive in 8.33%. Endobronchial mass found in 40 (48.19%), vocal cord palsy in 13 (15.66%), tracheal external compression in 8 (9.6%), widened carina in 19 (22.8%), bronchial external compression in 14 (16.66%). BAL cytology was positive in 58.49% (31/53), brushing was positive in 60% (15/25). Commonest presentation was lung mass (61.66%) on CXR and peripheral tumour 54 (57.45%) on CT. Adenocarcinoma was the commonest small cell carcinoma (48.33%), 50 (53.19 %) patients presented stage IV disease. **Conclusion:** Associated risk factors, symptoms, and investigations like CT guided FNAC, BAL cytology are enormously important to diagnose lung cancer in early stage so that further mortality & morbidity can be minimized.

Key words: Lung cancer, smoking, bronchoscope, chest X-Ray, CT thorax

Introduction

Lung cancer is the most common cause of cancer-related death worldwide, with approximately 3 million new cases per year estimated worldwide and accounting for more than one-third of all lethal cancers [1, 2]. Despite newer, more aggressive treatment regimens, the survival rate has not changed for several decades [3, 4].

The incidence of lung cancer is increasing globally [5, 6]. Death from lung cancer occurs at a higher frequency in men than in women. Lung cancer claims more lives of women than breast cancer. Several important determinants of variations in the incidence of lung cancer have been attributed to the prevalence of smoking in men and women, the type and amount of

cigarettes smoked, age at initiation, the duration of smoking exposure and air pollution. Genetic predisposition and previous euplastic lung disease are also among the risk factors for lung cancer. Cure can be achieved if the diagnosis is established early in the course of the disease, before lymph node involvement or distant metastases occur. Consequently, there is a need to obtain precise information about the primary lesion, lymph nodes, and metastases. Imaging techniques play an essential role in the diagnosis, staging, and follow-up of patients with lung cancer. For these purpose many methods are now available like Contrast-enhanced thoracic CT (TCT), positron emission tomography (PET), transesophageal endoscopic ultrasonography (EUS) and endobronchial ultrasound (EBUS). Hence we have conducted this study to diagnose lung malignancies in early stage to

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prevent the mortality and morbidity in rural areas and to make awareness among rural population.

Materials and Methods

All patients who were diagnosed as lung cancer in outpatient department, chest ward and patient referred from other ward during May 2013 to April 2016 were included in this study. Patients who has presented in OPD having history of cough, haemoptysis, chest pain, breathlessness, weight loss and having radiological features consistent with bronchogenic carcinoma have

been included in this study. Patients suspected of having lung cancer subjected to sputum cytology, CT Thorax, Bronchoscopy, FNAC depending on need. Patients who have absolute contraindication bronchoscopy like uncorrectable hypoxemia, unstable angina, unstable hemodynamic status & patients having coagulopathy or bleeding diathesis that cannot be corrected have been excluded.

All the patients have been examined thoroughly & personal history smoking, tobacco chewing were noted.

Results

In present study predominant age group was found to be 60 to 70 years followed by 50 to 60 years and male to female ratio was 2:1 (Table-1). 57.44% were smokers and rural populations dominated the urban one. Cough was the commonest symptom found in 88.33% of study patients. Sputum cytology was found to be positive in 8.33%. Commonest radiological finding was mass lesions, Endobronchial lesions were the commonest finding in fiberoptic bronchoscopy. Highest diagnostic yield was found in punch biopsy (63.63%) followed by bronchoscopic brushing (60%) and TBLB (60%). Bronchoscopy has pivotal role in diagnosis when tumour is situated centrally whereas in peripheral tumour CT /USG guided biopsy has superior role.

Table-1: Demographic profile of study subjects.

Age range in years	No. of patients	Percentage (%)	
21 – 30	4	4.25%	
31 – 40	5	5.31%	
41 – 50	19	20.21%	
51 – 60	22	23.40%	
61 – 70	33	35.10%	
>70	11	11.70%	
Male	63	67.02%	
Female	31	32.97%	
Smoking History:			
Smokers	54	57.44%	
Non smokers	40	42.55%	
Residence	Male	Female	Total
Urban	26	16	42 (44.68%)
Rural	37	15	52 (55.31%)

Table- 2: Symptoms at the time of initial presentation.

Symptoms	No. of patients	Percentage
Cough	84	88.33%
Breathlessness	81	85%
Chest pain	46	48.33%
Fever	29	30%
Haemoptysis	27	28.33%
Weight loss	34	35%
Peripheral Lymph node	34	35%
Hoarseness of voice	16	16.66%
SVC Syndrome	6	6.66%

Table-3: Sputum cytology & bronchoscopic findings.

Sputum cytology	No. of patients	Percentage	
Positive	8	8.33%	
Negative	86	91.66%	
Bronchoscopic Findings			
Normal	29	34.93%	
Vocal cord palsy	13	15.66%	
Tracheal external compression	8	9.6%	
Widened main carina	19	22.89%	
Bronchial external compression	14	16.86%	
Endobronchial mass	40	48.19%	
Diagnostic yield of various procedures:			
procedure	No. of patients	Positive	Yield%
BAL cytology	53	31	58.49%
Bronchoscopic brushing	25	15	60%
Punch biopsy	11	7	63.63%
TBNA	4	3	75%
TBLB	5	3	60%

Table- 4: X-ray and CT chest presentation of various lung cancer

X-ray findings	No. of patients	Percentage	
Mass	57	61.66%	
Consolidation	9	10%	
Pleural effusion.	18	18.33%	
ASPEN	4	3.33%	
Mass + effusion	6	6.66%	
CT location	Male	Female	Total
Upper lobe	32	15	47
Middle lobe	14	8	22
Lower lobe	17	9	25
CT Pattern:			
Location	No.	Percentage	
Central tumours	40	42.55%	
Peripheral tumours	54	57.45%	
Diagnosis of peripherally situated lung cancer:			
Diagnostic procedure	Number of patients	Positive cytology	Yield (%)
Bronchoscopy	28	9	32.14%
CT/USG guided biopsy	54	51	94.44%

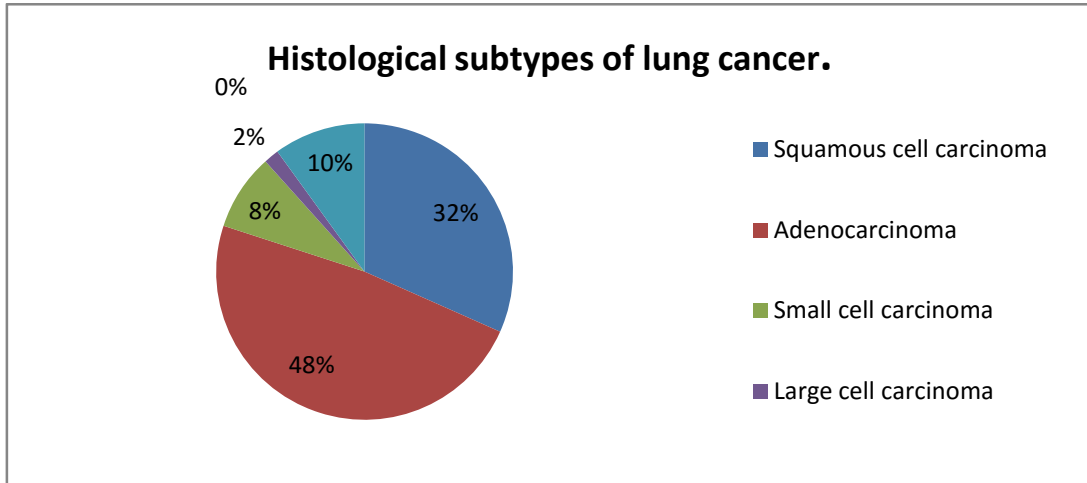


Figure-1:

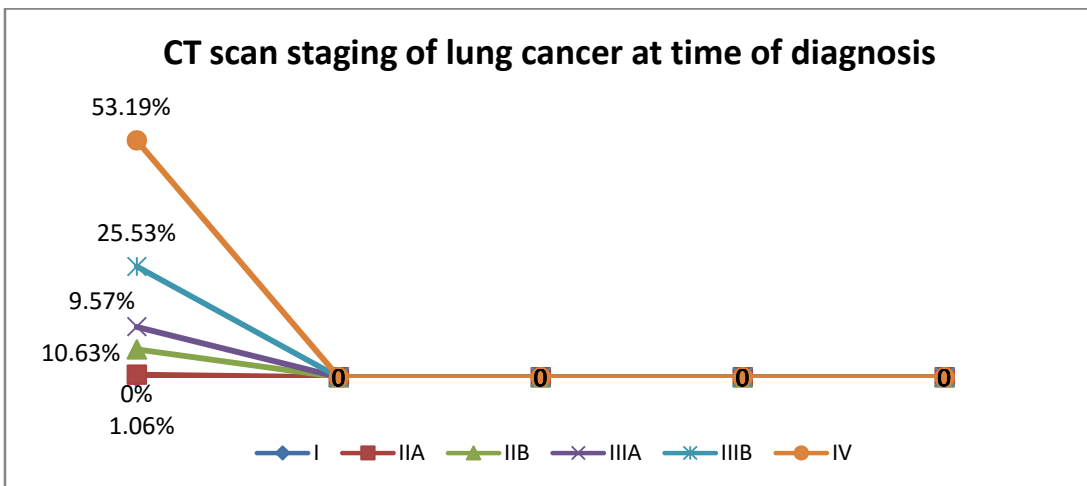


Figure-2:

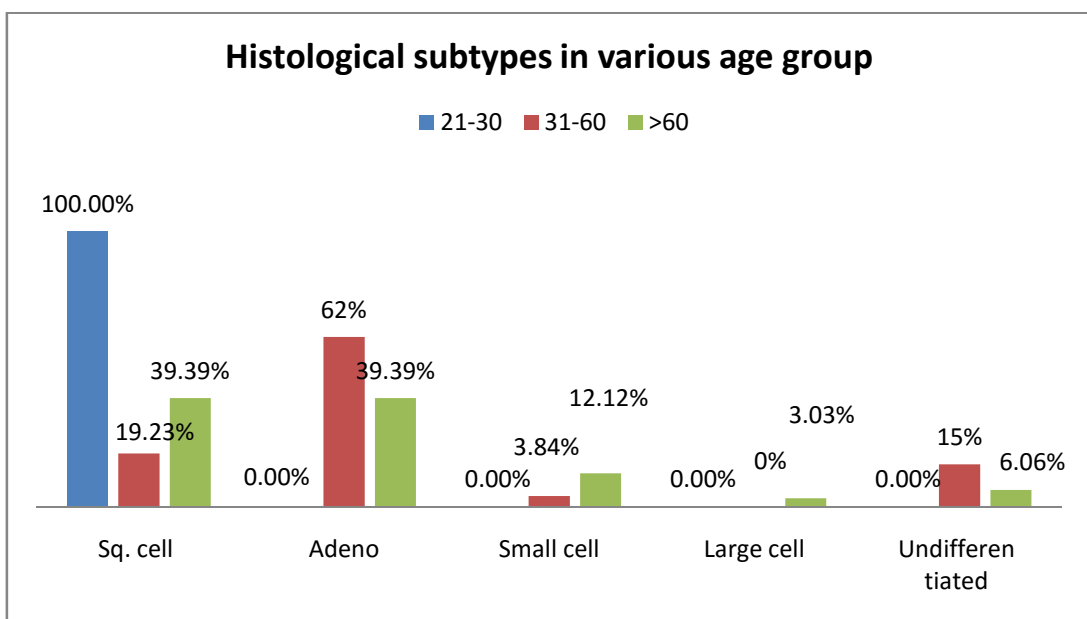


Figure-3:

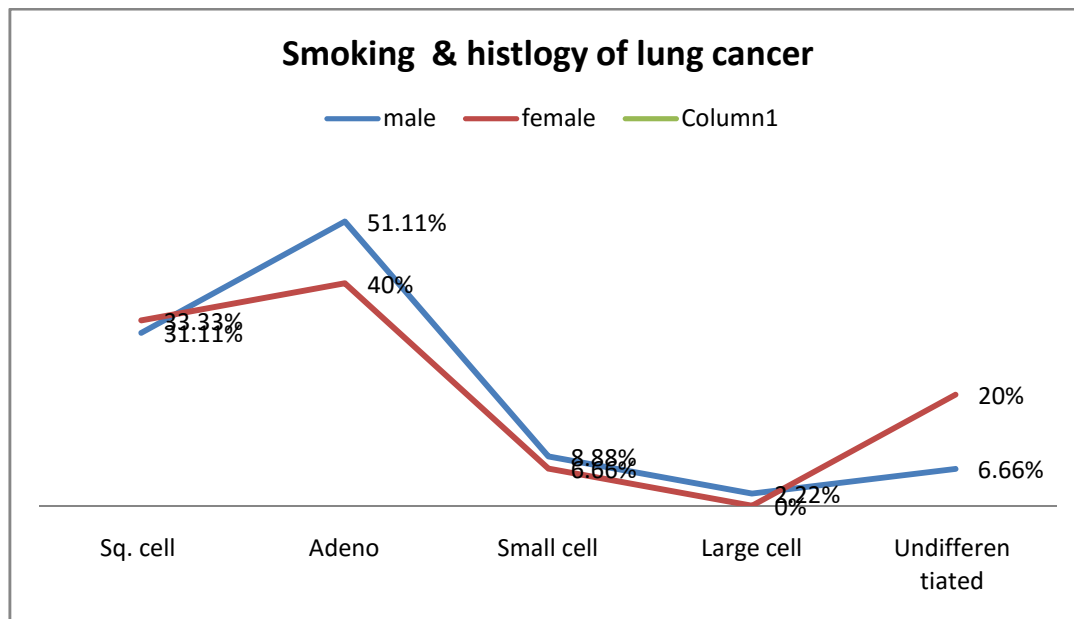


Figure-4 :

Discussion

Our aim was to study the clinical, radiological & histological profile of lung cancer. We analysed 94 patients of lung cancer over the period of 3 years. Different aspects of lung cancer including age, sex, smoking habits, pattern of distribution, diagnostic utility of different techniques, histological patterns were studied. Highest incidence of lung cancer was found in age group of 61-70. Out of 94 patients, 63 were males and 31 were females with a male: female ratio of 3:1 as compared to a ratio of 4:5 in a study by Jindal SK, et al [7] Reddy et al [8] found a male to female ratio of 4:1 in their studies.

In current study, 57.44% of the patients were smokers and 42.54% were non-smokers. In males 58.57% and in females 41.48% were smokers. This result was comparable to study conducted by Gupta et al [9]. In post graduate institute, Chandigarh in which 80% men and 33% women were smokers. Study by Peter B Bach [10] showed strong association of smoking with lung cancer. In a recent study by Dey A, et al [11], 73.2% patients were smokers and 26.8% were non smokers. Percentage of male smokers was 93.9%. Association of smoking with lung cancer was statistically significant in our study. Also, lung cancer development was significantly higher amongst male smokers than female smokers.

Majority of patients (55.31%) were from rural population (table-1). Lung cancer usually presents with

non specific symptoms. In a present study, cough was the most common symptom found in about 88.33% of patients (table 2). Followed by breathlessness (85%), chest pain (48.33%), fever (30%), haemoptysis (28.33%), weight Loss (35%) and peripheral Lymph nodes (35%) respectively. A study conducted by Vigg A et al [12] on pattern of lung cancer in elderly showed cough as a commonest symptom (85%) followed by fever and weight loss. Therefore if patient has cough associated with localising lesion on chest x ray, haemoptysis, localised wheeze, patient whose cough has changed in character or cough is unresponsive to routine line of treatment then sputum cytology, early fiberoptic bronchoscopy and CT scan of thorax is recommended.

Sputum cytology was positive only in 8.33% (table 3) of the patients. JIN P et al [13], has conducted study on sputum cytology of lung cancer among Yunnan tin miners from 1992 to 1997, diagnostic yield of sputum cytology was 32.74%. Study by Bocking et al [14], have shown that the sensitivity of sputum cytology for detecting lung cancer is highly dependent on the number of sputum specimens collected per patient, ranging from approximately 0.68 for a single specimen, to 0.78 for two specimens, to 0.85–0.86 for three or more specimens. Studies of the accuracy of sputum cytology for the diagnosis of lung cancer are difficult to summarize because of a variety of methodological problems [14].

Bronchoscopy was performed in total 53 patients (table-3). 29 patient had normal bronchoscopy findings. Vocal cord palsy was present in 13 patients and tracheal external compression was seen in 5 patients. Widened main carina, bronchial external compression, endobronchial lesion were present in 19, 14 and 40 patients respectively. Thus, abnormal bronchoscopy findings were present in 66.03% patients. Study conducted by Maecelo Fouad Rabahi [15], endobronchial mass (64%) and mucosal infiltration (35%) were the main bronchoscopic findings. Out of 25 patients with endobronchial mass, 11 patients underwent biopsy. 7 cases had positive yield. 5 patients turned out to be adenocarcinoma, 1 patient was diagnosed as squamous cell carcinoma and 1 patient small cell carcinoma. 4 cases in which biopsy were negative were diagnosed by BAL cytology and bronchial brushings. Remaining cases were not biopsied because growths were friable or bleed easily on touch. These cases were diagnosed on BAL cytology alone and BAL cytology and bronchial brushings combined. Transbronchial needle aspirations were done in patients with widened main carina or tracheal/ bronchial external compressions. Out of 4 patients who were diagnosed by TBNA, 3 had adenocarcinoma and one was diagnosed as large cell carcinoma. Transbronchial lung biopsy was done in 5 patients. Positive results for malignancy were obtained in 3 patient's viz. large cell carcinoma, undifferentiated non small cell carcinoma and adenocarcinoma was diagnosed in one patient each. BAL cytology was positive in 58.33% patients. Bronchoscopic brushing was positive in 60% patient and punch biopsy in 63.63% patients. Diagnostic yield of TBNA was 80% while that of TBLB was 75%. In a study by A vigg A et al [12] diagnostic yield of TBLB was 48%. Recent study by Liam CK et al [16] Showed yield of BAL cytology, bronchial brushing, punch biopsy and TBLB as 28.3%, 53.7%, 77.5% and 31.5% respectively. In a study by Chhaged PN et al. [17], bronchial brushing cytology yielded positive results in 51.72% of central tumours and 40% in peripheral tumours. Yield of endobronchial biopsy was 59% and transbronchial biopsy was 60%. Mitchel et al [18]. reported 41% biopsies positive for malignancies. Webb and Clarke and MacDonald [19] have shown that when tumour is visible at bronchoscopy, an accurate diagnosis can be made in 85 to 90 percent of cases.

In present study most common presentation on chest x ray (Table 4) was mass (61.66%) followed by pleural effusion (18.33%). Consolidation was a presenting feature in 6 patients (10%). 4 patients (6.66%) had both

mass and effusion on chest x ray and 2 patients presented with SPN (3.33%). These results were similar to a recent study by Dey A et al. [11] where most common radiological presentation was mass (77.3%) followed by effusion (27.8%) and collapse (18.6%). Study by Sharma CP et al [20] describes mass as common radiological finding followed by pleural effusion. Study by BeheraD et al [21] also showed similar results.

Also peripheral tumours were present in 57.45% patients while central tumours were found in 42.55% patients. This result is similar to studies conducted by Rawat et al [22] and Sharma et al [20] Study by Vigg A et al [12] also showed that peripheral tumours were more common than central tumours. (60.2% Vs.39.8%). Out of 25 cases recorded for central tumours 44% of central tumours were squamous cell carcinoma, 44% were adenocarcinoma, 8% small cell carcinomas, 4% undifferentiated non small cell carcinoma (table 4). Out of 35 cases of peripherally located tumours 51.42% were adenocarcinomas, 22.85% squamous cell carcinomas and 8.57% each small cell and large cell tumours. Undifferentiated non small cell carcinoma was found in 14.28% of peripheral tumours. Study by Sharma et al [20] presented central mass (72.2% cases) was more common among squamous cell carcinoma than as a peripheral lesion (27.8%). Small cell cancer also presented more commonly as a central lesion (83.6%) than as a peripheral lesion (16.4%). Thus this study denotes that squamous cell carcinoma commonly presents as central tumours whereas adenocarcinoma as peripheral tumours.

Adenocarcinoma was predominant histological subtype present in 48.33% (Fig 1) patients followed by squamous cell carcinoma in 31.66% patients. Small cell carcinoma, large cell carcinoma and undifferentiated non small cell carcinoma were present in 8.33%, 1.66% and 10% patients respectively. This result is in contrast with most of Indian studies where squamous cell carcinoma was most common histological subtype found. Study by Sharma et al [20]. showed the similar results. However recent study in Tata Memorial Hospital by V Noronha [23], has shown adenocarcinoma as a most common subtype found in 43.8% followed by squamous cell carcinoma 26.2%. Chhaged PN [18], also found adenocarcinoma as a commonest histological subtype in their study In our study majority of patients were presented at advanced stage. (Fig 2) 53.19% patients were diagnosed with stage IV disease, 25.53% patients with stage IIIB,

9.57% with stage IIIA, 10.63% patients with stage IIB and 1.06% with stage IIA. Chandra S et al [24], conducted study, found 90.2% of NSCLC patients had stage IIB or IV disease at the time of diagnosis. In a study by Bhattacharyya Sujit Kumar et al [25], about 71.8% patients diagnosed in the later stage of diseases were either in stage IIB or IV. However extensive investigation for staging of lung cancer was not possible due to economic constrains and unavailability of certain diagnostic modalities, like PET scan, mediastinoscopy, thoracoscopy, and others in rural institution. CT scan of other organs and bone scan was done in symptomatic patients only. Hence accurate staging was not possible and the actual number of patients with nonresectable carcinoma stage III B/IV disease may actually be under reported in this study.

Out of 29 patients presenting with stage IV lung cancer, 10 patients had distant metastasis to liver, 7 patients had metastasis to brain and 3 patients presented with metastasis to adrenal gland. Out of 15 patients with malignant pleural effusion 6 patients had both malignant pleural effusion as well as distant metastasis.

Majority of squamous cell carcinoma (84.21%) were found in smokers (Fig 4) while 4 of 5 cases of small cell carcinomas were reported in this group. Adenocarcinoma was seen in 35.89% of smokers. This shows increasing incidence of adenocarcinoma in smokers. Only one case of large cell carcinoma that was noted in our study was in a smoker. Non smokers showed a predilection for adenocarcinomas (71.42%) followed by squamous cell carcinoma (14.28%). Undifferentiated non small cell carcinoma was found in 10.25 % of smokers and 9.52% amongst non smokers. Radzikowska et al [26] concluded that the association of smoking and lung cancer is most strong among SCC and SCLC, whereas it is weaker for adenocarcinoma. Studies by Dey A et al. [11] and V Noronha et al. [23] also showed that squamous cell carcinoma and Small cell carcinoma were predominant histological subtype amongst smoker and adenocarcinoma amongst non smokers.

In present study, out of 28 cases of peripheral tumours bronchoscopy diagnosed (Table 4) only 9 cases with a yield of 32.14%, while CT/USG guided FNAB diagnosed 32 of 35 cases with a yield of 94.28% (table 4). A study by Jagdish Ravat et al [22] showed FNAB done under CT is the investigation of choice for peripherally situated lesions. Percutaneous FNAB done under CT guidance is the investigation of choice for

peripherally situated lesion, which has very minimal complication rates as seen in various international [27-29] and Indian studies [30, 31].

Also in this study, out of total 15 patients with pleural effusion pleural fluid cytology was positive for malignancy in 46.66% patients and pleural biopsy yielded positive results in 73.3% patients. In a study by Somnath Bhattacharya et al [32]. Diagnostic yield of pleural fluid cytology was 69% and diagnostic yield of blind pleural biopsy was 48%. Closed pleural biopsy was positive for malignancy in cases where pleural fluid cytology was negative. Chang and associates [33] performed thoracocentesis, closed pleural biopsy and bronchoscopy in 140 patients with pleural effusions. The combination of these procedures resulted in diagnosis in 100 (71%) of the patients: 68 patients were diagnosed by thoracocentesis or pleural biopsy or both; bronchoscopy provided diagnosis in additional 32 patients.

Conclusion

Thus awareness of symptoms and associated risk factors are enormous important to diagnose lung cancer in early stage so that further mortality & mobility can be minimised in rural areas.

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