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Comparative study of clinico-radiological pattern of patients with small cell and non small cell lung cancer

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***Abstract*---**Bronchogenic carcinoma is a malignant neoplasm of the lung arising from the epithelium of the bronchus. NSCLCs are a heterogeneous group, of which the most common subtypes are squamous cell carcinoma and adenocarcinoma. Squamous cell carcinomas are also predominantly linked to smoking. This study is planned to describe the clinical and radiological presentation of Small cell and Non-small cell lung cancer. The study included one hundred thirty patients admitted in various wards of hospital in chest Diseases and Tuberculosis & General Medicine department, at National institute of medical science & research, Jaipur between January, 2021 and December, 2021. Only those patients diagnosed as Primary lung cancer were included in this study. The present study included 130 proven cases of lung cancer. Two major histo-types of lung cancer SCLC and NSCLC were then correlated with their clinical and radiological features. 65 patients of each group were selected for study. Cough (with or without expectoration) was the common symptom (83.08%) observed in lung cancer patients. Chest pain was the next common symptom (80.77%) and had similar distribution in SCLC and NSCLC group patients. weight loss and Dyspnoea were the next common symptom observed. Clubbing was the most common

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{32.31%} clinical sign of lung cancer observed in the present study. Lymph node enlargement was seen in 20.77% of the patients in the present study. The predominant radiological feature of NSCLC in the present study was the parenchymal involvement i.e. a large mass lesion and /or evidences of bronchial obstruction such as collapse and obstructive pneumonitis. It is concluded that, a better knowledge regarding the clinical and radiological spectrum of SCLC and NSCLC lung cancer. This will be helpful for an early diagnosis, which affords an improved opportunity for either cure or expeditious treatment.

***Keywords*---**lung cancer, small cell lung cancer (SCLC), non small cell lung cancer (NSCLC).

Introduction

Bronchogenic carcinoma is a malignant neoplasm of the lung arising from the epithelium of the bronchus. Lung cancer continues to be the leading cause of cancer related deaths worldwide.[3] Despite improvements in survival for many other types of cancer in recent years, 5-year survival for lung cancer has remained relatively poor, mainly because by the time a diagnosis is made, lung cancer is often well advanced and treatment options are limited.[4-5] The most important risk factor for lung cancer is tobacco smoking. The relationship between smoking and lung cancer is one of the most thoroughly investigated issues in biomedical research,[5] and compelling evidence has built up since the middle of the twentieth century to indicate that smoking is the predominant causal factor for lung cancer.[6–9]

Nearly all patients (over 95%) diagnosed with SCLC are current or ex-smokers.[10] NSCLCs are a heterogeneous group, of which the most common subtypes are squamous cell carcinomas and adenocarcinomas. Squamous cell carcinomas are also predominantly linked to smoking.[11] Despite advances in chemotherapy, prognosis for lung cancer patients remains poor, with 5-year relative survival less than 14% among males and less than 18% among females in most countries. The clinical presentation of lung cancer usually depends on duration, location and extent of involvement. All these factors point towards the need for a better knowledge among doctors regarding the various clinical and radiological presentations of Small cell and Non small cell lung cancer. This will be helpful for an early diagnosis and management of this dreaded disease.

Aims and Objectives

To describe the clinical and radiological presentation of Small cell and Non small cell lung cancer.

Materials and Methods

The study included one hundred thirty patients admitted in various wards of hospital in chest Diseases and Tuberculosis & General Medicine department, at National institute of medical science & research, Jaipur between January, 2021

and December, 2021 Only those patients diagnosed as Primary lung cancer were included in this study.

Inclusion criteria

Patient having a confirmed histopathological or cytopathological reports suggestive of primary lung cancer (small cell & non small cell).

Exclusion criteria

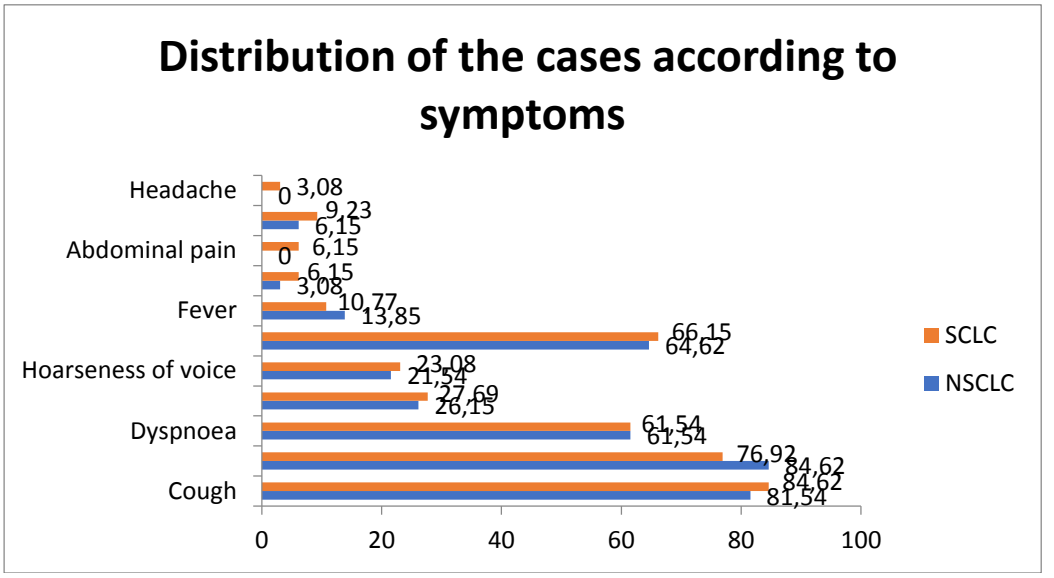
Secondaries in lung from extra pulmonary sites, Lympho-proliferative disease, Malignant pleural effusion of unknown primary or non-pulmonary site were excluded. A detailed history of each patient was taken. It included the following: Name, age, sex, Occupation, Presenting symptoms, History of present illness. A thorough general physical examination and examination of respiratory system were done. The patients were then subjected to routine investigations as following: Blood for Haemoglobin percentage, Total leucocyte count, Differential leucocyte count, Erythrocyte sedimentation rate. The patients were then subjected to chest postero-anterior view in all cases and CECT Thorax and various diagnostic procedures.

Result

The present study included 130 proven cases of lung cancer. Two major histotypes of lung cancer SCLC and NSCLC were then correlated with their clinical and radiological features. 65 patients of each group were selected for study. The following tables were used for the analysis of the collected data.

Table 1
Distribution of the cases according to symptoms

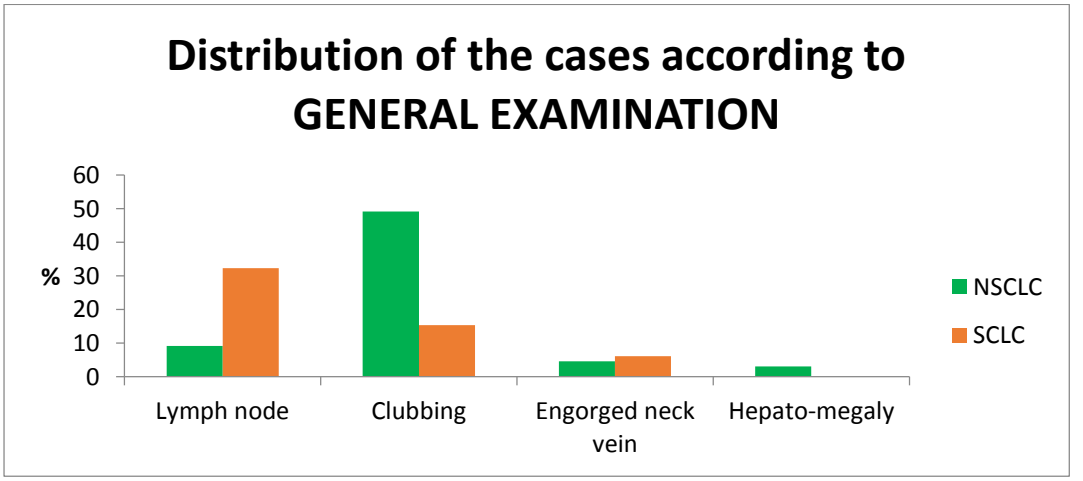
	NSCLC		SCLC		Total		P Value LS
Symptoms	No	%	No	%	No	%	%
Cough	53	81.54	55	84.62	108	83.08	0.81NS
Chest pain	55	84.62	50	76.92	105	80.77	0.37NS
Dyspnoea	40	61.54	40	61.54	80	61.54	0.857NS
Hemoptysis	17	26.15	18	27.69	35	26.92	1.0NS
Hoarseness of voice	14	21.54	15	23.08	29	22.31	1.0NS
Weight loss	42	64.62	43	66.15	85	65.38	1.0NS
Fever	9	13.85	7	10.77	16	12.31	0.78NS
Facial edema	2	3.08	4	6.15	6	4.62	0.67NS
Abdominal pain	0	0.00	4	6.15	4	3.07	0.128NS
Dysphagia	4	6.15	6	9.23	10	7.69	0.7NS
Headache	0	0.00	2	3.08	2	1.54	0.47NS



Graph 1. Showed Distribution of the cases according to symptoms

Table 2
Distribution of the cases according to General Examination

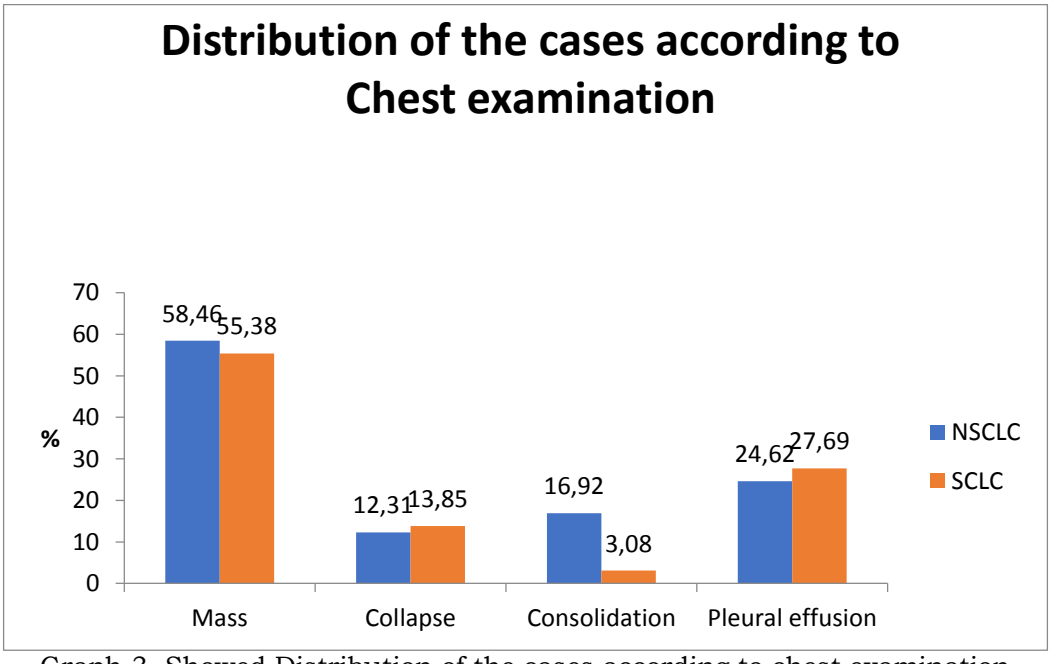
GENERAL EXAMINATION	NSCLC		SCLC		Total		P Value LS
	No	%	No	%	No	%	%
Lymph node	6	9.23	21	32.31	27	20.77	0.002S
Clubbing	32	49.23	10	15.38	42	32.31	<0.001S
Engorged neck vein	3	4.62	4	6.15	7	5.38	1.0NS
Hepato-megaly	2	3.08	0	0.00	2	1.54	0.47NS



Graph 2. Showed Distribution of various clinical signs of lung cancer

Table 3
Distribution of the cases according to Chest examination

	NSCLC		SCLC		Total		P Value LS
Chest examination	No	%	No	%	No	%	%
Mass	38	58.46	36	55.38	74	56.92	0.85NS
Collapse	8	12.31	9	13.85	17	13.08	1.0NS
Consolidation	11	16.92	2	3.08	13	10.00	0.019S
Pleural effusion	16	24.62	18	27.69	34	26.15	0.84NS

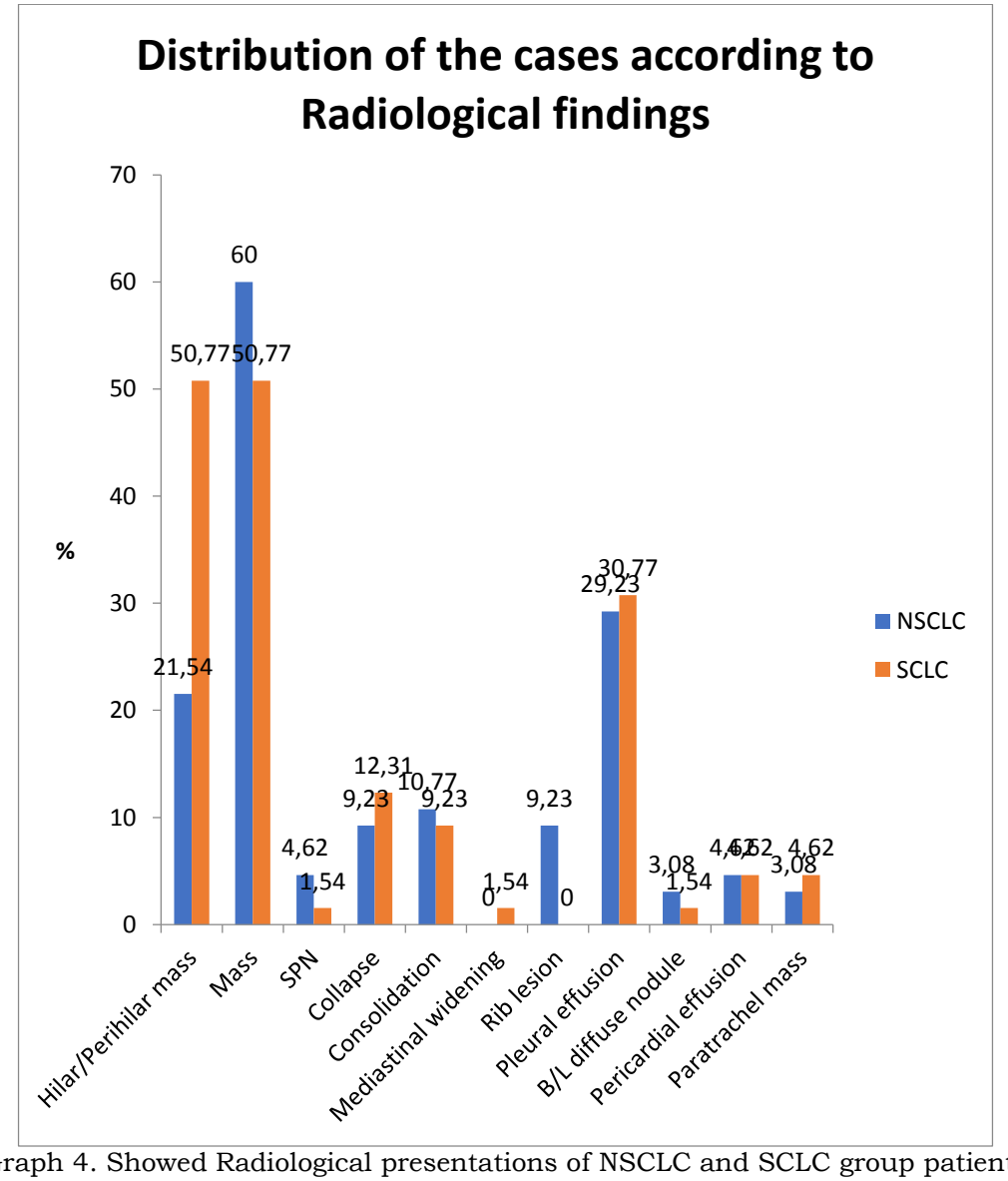


Graph 3. Showed Distribution of the cases according to chest examination

Table 4
Distribution of the cases according to Radiological findings

Radiological findings	NSCLC(N=65)		SCLC(N=65)		Total(N=130)		P Value LS
	No	%	No	%	No	%	%
Hilar/Perihilar mass	14	21.54	33	50.77	47	36.15	0.001S
Mass	39	60.00	33	50.77	72	55.38	0.37NS
SPN	3	4.62	1	1.54	4	3.08	0.61NS
Collapse	6	9.23	8	12.31	14	10.77	0.77NS
Consolidation	7	10.77	6	9.23	13	10.00	1.0NS
Mediastinal	0	0.00	1	1.54	1	0.77	1.0NS

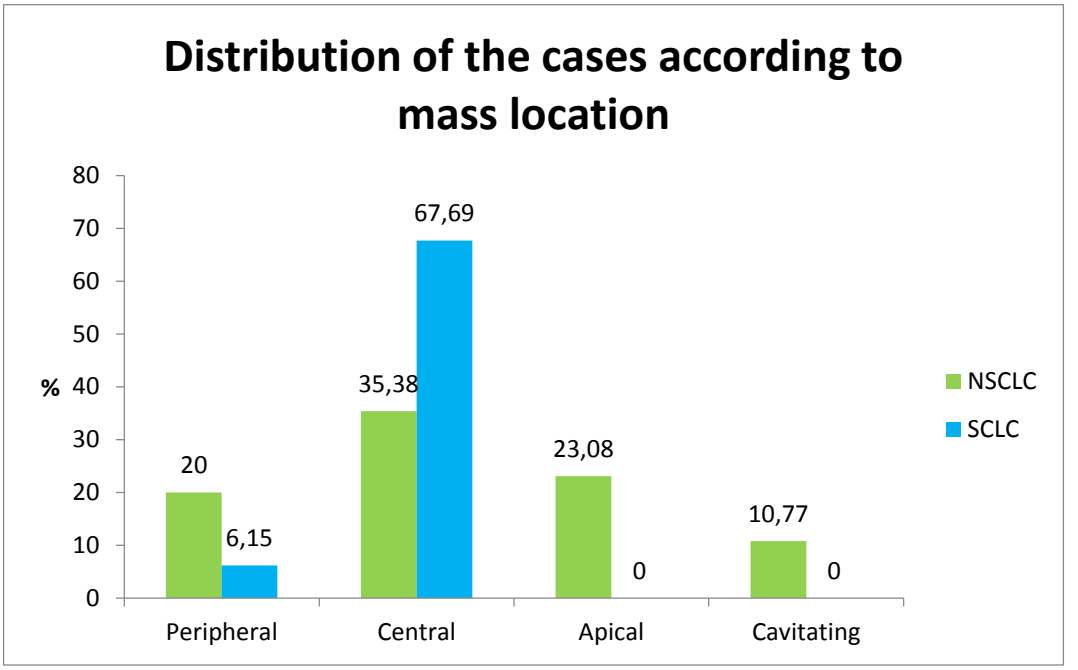
widening							
Rib lesion	6	9.23	0	0.00	6	4.62	0.037S
Pleural effusion	19	29.23	20	30.77	39	30.00	1.0NS
B/L diffuse nodule	2	3.08	1	1.54	3	2.31	1.0NS
Pericardial effusion	3	4.62	3	4.62	6	4.62	0.67NS
Paratrachel mass	2	3.08	3	4.62	5	3.85	1.0NS



Graph 4. Showed Radiological presentations of NSCLC and SCLC group patients

Table 5
Distribution of the cases according to mass location

Location	NSCLC		SCLC		Total		P Value LS
	No	%	No	%	No	%	%
Peripheral	13	20.00	4	6.15	17	13.08	0.037S
Central	23	35.38	44	67.69	67	51.54	<0.001S
Apical	15	23.08	0	0.00	15	11.54	<0.001S
Cavitation	7	10.77	0	0.00	7	5.38	0.02S



Graph 5. Show Location of mass Lesions.

Discussion

The frequency of various symptoms observed in the patients of lung cancer in the present study were similar to that reported earlier by many Indian and Western authors. {jain et al, 1989 and Jindal and behaera 1990}. [20, 21, 23] The present study was undertaken to know the clinico-radiological presentations of two major histological types NSCLC and SCLC. Cough (with or without expectoration) was the common symptom (83.08%) observed in lung cancer patients. In NSCLC group patients 81.54% presented with cough while SCLC group patients 84.62% presented with cough. Expectoration was the more common in NSCLC patients (60%), while in SCLC patients it was (44.62%).

The Bronchial symptoms such as cough with or without expectoration and hemoptysis were found to be more common in NSCLC (squamous cell cancer) and small cell cancer in the present study and these were less common in adenocarcinoma. Feinstein et al {1974} reported a similar relationship.[12,] Ehler et

al noted that 2/3rd of squamous cell cancer begin with bronchial symptoms, Whereas only 40 % of adenocarcinoma have a similar onset.[12] Chest pain was the next common symptom (80.77%) and had similar distribution in SCLC and NSCLC group patients. Weight loss was the next common presenting symptom observed in 65.38% patients. Dyspnoea was the next common symptom observed in 61.54% patients and had similar distribution in SCLC and NSCLC group patients. Hemoptysis and Hoarseness of voice were observed 26.92% and 22.31% respectively in lung cancer patients with almost similar distribution in NSCLC and SCLC group patients.

Clubbing was the most common {32.31%} clinical sign of lung cancer observed in the present study. Previous studies reported the frequency of clubbing in 30% to 70% of patients {Nafae et al, 1973 and Jain et al 1989}. [16, 20] This sign was found to be predominant in NSCLC (squamous cell cancer and adenocarcinoma) {49.23%} and less common in small cell cancer {15.38%}. The results of present study are in agreement with the study of Hyde and Hyde {1974} who reported that clubbing occurred more frequently in squamous cell cancer than other types.[23] Fishman {1994} also reported this as a common feature of non- small cell lung cancer {NSCLC}.[28] According to Crofton and Douglas {1989} clubbing occurs rarely in Oat- cell cancer.

Lymphnode enlargement was seen in 20.77% of the patients in the present study. Earlier reported this sign with a varying frequency of 20% to 60% {Basu and Gosh {1971} and Jain et al {1989}.[13,15, 20,29] It was seen more commonly is small cell lung cancer (32.31%) Vs NSCLC (9.23%) in present study. Superior vena caval syndrome was seen in 5.38% of cases in the present study. Basu and Gosh {1971} and Jindal and Behara {1990} who reported this syndrome in 13% and 16 % of the cases respectively.[13, 15, 21] According Roswit {1953} S.V.C. syndrome is nearly always associated with the anaplastic variety of lung cancer.[22] Crofton and Douglas {1989} say that S.V.C. obstruction is most commonly associated with small cell cancer and may be seen in 10% of patients with lung cancer. This feature was relatively more frequent in small cell cancer {6.15%} in comparison to other types in our study.

The most common radiological feature in the present study was parenchymal involvement (55.38%). Earlier works by cohen et al (1967) and Jindal et al (1979) showed this feature in 60% and 69% of patients with lung cancer respectively.[17, 19] Some workers like Nafae et al (1973) and Jain et al (1987) reported a little higher incidence of this radiological feature, 84% and 86% respectively.[16, 18] Hilar involvement was seen 36.15% of lung cancer in the present study. Jain et al (1987) reported this feature in 30% cases.[30] The evidence of intra thoracic extrapulmonary involvement was seen radiologically in 44.63% of lung cancer in the present study. The different manifestations of this feature, such as rib erosion, mediastinal involvement, pleural effusion, and paratracheal mass etc. were found in a comparable frequency in earlier by Jain et al (1987) and Jindal and Behera (1990).[17, 19, 21. 30, 31]

Byrd et al (1969) had tried to correlate the histological type of lung cancer with their radiological presentation. A similar study was done by Jain et al {1987}. The predominant radiological feature of NSCLC in the present study was the

parenchymal involvement i.e. a large mass lesion and /or evidences of bronchial obstruction such as collapse and obstructive pneumonitis. This was seen in 60 % of patients with NSCLC. This was followed by hilar involvement {21.54%}. The most common single abnormality of NSCLC was a large peripheral mass found in 43.07 % of cases. The evidence of bronchial obstruction was more common in NSCLC when compared to other types of lung cancer. These findings correlate well with that of Byrd et al {1969} and Jain et al {1987}.[18,25] The mass lesions and the evidence of bronchial obstruction were of almost equal in frequency in present study compared to the studies by Byrd et al {1969} and Jain et al {1987} in which the evidence of bronchial obstruction were more common.[18, 25] Liebow {1955} noted a difficulty in distinguishing the actual tumour in the presence of alterations in the pulmonary tissue consequent to bronchial obstruction caused by the tumor. According to Murray and Nadel {1994} a central lesion with a hilar involvement with or without obstruction pneumonitis is the most common radiological finding in squamous cell cancer.[27]

The most common presenting radiological features of small cell cancer in the present study was the hilar involvement (50.77%). These findings are in contract to that by Byrd et al {1969} and Jain et al {1987} who reported the hilar involvement as the predominant radiological feature of small cell cancer.[18, 25] According to Murray and Nadel {1994}, there can be considerable overlaps in the radiological abnormalities among the cell type of lung cancer.[27] The next common radiological feature of small cell cancer was parenchymal involvement {50.77%}. Which is equal to hilar involvement. The next common presenting feature was intrathoracic extrapulmonary involvement and was seen in 41.53% small cell cancer cases. This may be due to the aggressive nature of the tumour, which spreads rapidly through lympo- hematogenous routes leading to extensive metastasis at the time of presentation {liebow, 1955: Selby et al, 1963 and sider 1990}. Selby et al {1963} also noted that the metastatic lesions of small cell cancer can appear early and may be more apparent than the primary lesion itself.[24] Selby et al {1963}, Byrd et al {1969} and Sider {1990} noted that mediastinal mass/ widening was more common in small cell cancer than other types.[24, 25, 26] Mediastinal involvement was more common {1.54%} in small cell cancer in comparison to other types in the present study. Selby {1963} reported pleural effusion with or without atelectasis in 39 % of small cell cancer.[24] Pleural effusion was seen in small cell cancer 30.77% of patients in the present study. Cavitation in mass found in 7 out of 65 patients of NSCLC and all the 7 patients belong to squamous cell cancer.

Conclusion

According to symptoms, no symptoms show a definite correlation with two major histotypes NSCLC and SCLC. Lymph node involvement significant in SCLC and clubbing was significant in NSCLC. The commonest radiological presentation was parenchymal involvement (Mass lesion) seen in 55.38% patient of lung cancer. Hilar/ Perihilar mass was more common in SCLC group, Which was seen in 33 patients out of 65 and 14 patients in NSCLC groups. Hilar/Perihilar mass was significant in SCLC as compared to NSCLC **(**50.77% Vs 21.54 %). It is concluded that, a better knowledge regarding the clinical and radiological spectrum of SCLC

and NSCLC lung cancer. This will be helpful for an early diagnosis, which affords an improved opportunity for either cure or expeditious treatment.

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