Original Research Paper

Pulmonary Medicine

COMPARATIVE STUDY OF CLINICO-RADIOLOGICAL PROFILE OF PATIENTS WITH SMALL CELL AND NON-SMALL CELL LUNG CANCER AT INSTITUTE OF RESPIRATORY DISEASES (IRD), SMS MEDICAL COLLEGE, JAIPUR DURING 2021-23

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ABSTRACT **Introduction:** According to the GLOBACON report 2018, lung cancer affected about 11.6% of all malignancies and resulted 18.4% of all cancer-related fatalities. Despite significant breakthroughs in lung cancer screening, primary prevention through tobacco control remains the dominant technique to fight against lung cancer. **Objective:** To compare clinical and radiological profile of patients with small cell and non-small cell lung cancer. **Methodology:** This Hospital based observational study conducted on 110 diagnosed primary lung cancer patients at IRD, S.M.S. hospitals, Jaipur. In the period of Jan 2022 to August 2022. **Result:** A total of 110 patients with primary lung cancer were enrolled in this study. Mean age of patients was 61±6.06 year, among them 76.4% were male and 23.6% were female. Cough (90%), chest pain (71.8%) was the most common symptom while mass (88.2%), clubbing (75%) was the most common sign. Adenocarcinoma (ADC) (71%) was the most common histopathological type followed by squamous cell carcinoma (SqCC) (20.80%). Most common site of metastasis was bones (56.1%).

KEYWORDS : Adenocarcinoma, Lung cancer, Small cell lung cancer, Squamous cell carcinoma.

INTRODUCTION:

Lung cancer is the world's leading cause of cancer-related death. According to the GLOBACON report 2018, lung cancer affected about 11.6% of all malignancies and resulted 18.4% of all cancer-related fatalities. It was projected that lung cancer incidents are on track to increase by 38% to 2.89 million by 2030, globally and its mortality to reach 2.45 million worldwide by 2030, a 39% increase since 2018. Tobacco is the most important risk factor. A fibre-optic bronchoscopy or an image-guided biopsy is used to make the diagnosis. ADC has exceeded the previously dominant SqCC in both genders [5].

Cough, hemoptysis, chest pain, dyspnoea, hoarseness of voice and fever were the main presenting features. In our country due to high prevalence of tuberculosis, often leads to misdiagnosis and delayed diagnosis of lung cancer.

Lung malignancies are generally classified as non-small cell carcinoma (NSCLC) accounting more than 80% of cases and small cell lung carcinoma (SCLC). SCLCs are aggressive and are usually treated non-surgically, whereas NSCLC are treated with a mix of surgery and adjuvant therapy.

Recognising the variability of NSCLC has resulted in its subclassification, culminating in World Health Organisation (WHO) categories in 2004 and 2015 & 2021 [2,3]. Adenocarcinoma (ADC), squamous cell carcinoma (SqCC), and large cell carcinoma (LCC) are the 3 most common type of NSCLC. NSCLC may have intrathoracic effects and extrathoracic effect. Intrathoracic effects can include cough, haemoptysis, chest pain, dyspnea, or hoarseness, which can be appreciated on history and physical exam. SqCC can cause Pancoast syndrome, manifested by pain in the shoulder (but may also include the forearm, scapula, or fingers), Horner syndrome, atrophy of the hand muscles, or bony destruction. Bony metastasis can be suspected during the physical examination as approximately 20% of NSCLC have bone metastases on initial presentation [5].

SCLCs, very aggressive and account approximately 10% of all lung malignancies. The majority of patients relapse within the first 2 years of treatment, and the 2-year survival rate in metastatic patients is less than 10%. Routine hematoxylin and eosin (H&E)-stained section provides a high level of diagnostic accuracy.

OBJECTIVES:

To compare clinical and radiological profile of patients with small c ell and non-small cell lung cancer.

MATERIAL & METHODS:

This Hospital based observational study conducted at IRD, S.M.S. hospital, Jaipur. The study period was from Jan 2022 to Aug 2022.

All diagnosed primary lung cancer patients admitted at IRD, above 18 years of age were included in this study.

Patients on chemo/ radiotherapy or completed treatment related to cancer and patients with chronic pulmonary diseases like asthma, bronchiectasis, active PTB, ILD etc., were excluded from the study.
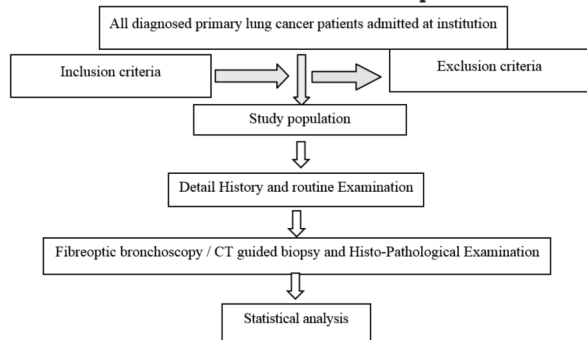
Sample size was calculated at 95% confidence level and alpha error of 0.05 assuming prevalence of mass lesion is found to be 80% (as per reference article) At the relative error of 8% the required sample size was 100 subjects which is further enhance to 110 subjects as final sample size with 5% attrition.

After the ethics committee approval for the study protocol. Those patients who fulfil the inclusion criteria were selected. Informed consent was obtained from patients or their relative. Complete history of patient, general, systemic and local examination done before going investigations.

Procedure:

Primary lung cancer whose lung tissue sample has been taken by Fibreoptic bronchoscopy / CT guided biopsy, then by HistoPathological Examination they are differentiated into NSCLC & SCLC. NSCLC further differentiated by IHC markers into ADC and SqCC.

Flow Chart Of The Study

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┌─────────────────────────────────────────────────────┐
│ All diagnosed primary lung cancer patients admitted at institution │
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│  Inclusion criteria   │  ⇒      ⇒   │  Exclusion criteria   │
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              │   Study population    │
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        │ Detail History and routine Examination │
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  │ Fibreoptic bronchoscopy / CT guided biopsy and Histo-Pathological Examination │
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              │  Statistical analysis │
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Statistical Analysis- Results are expressed as mean and standard deviation. Statistical analysis was carried out by student's t-test for parametric data and chi square test, test for non-parametric data. A p value < 0.05 was considered as statistically significant.

OBSERVATIONS & RESULTS:

- A total no. of 110 patients with lung cancer were selected for the study after applying inclusion and exclusion criteria.
- In our study mean age of patients were 61±6.06 year, among them 76.4% were male and 23.6% were female.
- 88.2% had a smoking history and mean smoking index among the smoker was found to be 318.0±109.3.
- Mass (88.2%) and clubbing (75%) was the most common presenting sign in patients followed by Peripheral lymphadenopathy (16.4), SVC obstruction (15%), Pleural effusion (11.8%) and Consolidation (8.2%). Similarly cough (90%) and chest pain 71.8% was the most common symptoms, followed by Wight loss (64.5%), Dyspnoea 59.1%, Haemoptysis (44.5%), and Fever (30%).
- Distribution of participants according to radiological finding and diagnosis are depicts in table no.1 and Figure no.1 and table no.2.
- 39.1% of participants had a 1 ECOG score, 24.5% had a 2 ECOG score, 20 had a 3 ECOG score, and 16.4% had a 4 ECOG score (table no.2).
- Most common site for extra thoracic metastatic was bones (56.1 %,) followed by adrenals (19.5%), liver (18.6%) and brain (16.5). Other sites of extra thoracic metastatic deposits were brain, spleen, and kidneys.
- In our study, no statistically significant difference of proportions of age, gender and person with smoking history were found in between small and non-small cell carcinoma.

DISCUSSION:

In recent years, incidence of ADC has increased. Patients with lung cancer usually present at an advanced stage of the disease, with a wide range of clinical symptoms. This factor further delays the diagnosis of patients with this illness.

Total 110 case with primary lung cancer patients were selected, mean age of patients was 60.4±6.1 these findings are comparable to previous Indian studies, Malik P et.al. and Prasad R et.al. However, as per study of Navin P et. Al. average age of our patients was a decade younger when compared to developed countries.

In our study, male predominance was observed it could be due to more smoking habit (88.2% in our study). Despite of these facts a rising lung cancer incidence was being observed among Indian females now days. The reason is multifactorial such as increasing smoking habits among females, traditional stoves and biomass fuel, less ventilated house and second hand smoker.

In our study, cough, chest pain and dyspnea were the most common symptoms and Mass, clubbing and weight loss were the most common sign.This observation was similar to previous Indian literature like Navin P et. Al.[11] and Dhandapani S et.al.

In our study, non-statistically significant difference of proportions of age, gender and person with smoking history were found in between small and non-small cell carcinoma.

Lung cancers present more often on the right than the left side, and in the upper than in the lower lobes according to many studies Dhandapani S et.al.[13] which is analogous to the observation made in our study. It could be due inhaled particles deposition more readily occur in the airways of upper lobes, in particular those of the right upper lobe because of differential particle impaction and aerodynamic characteristics of the upper lobe bronchial branches. Tumor initiation and survival happen more freely in tissues with higher oxygen levels as a result of a higher rate of free radical formation and third is that cancers may arise adjacent to scar tissue, which occurs more frequently in the upper lobes as a result of previous infections.

The most common radiological presentation seen in our study was mass lesion (88.2%) which was almost similar to that reported by various studies, Rami-P et.al. Next common radiological finding was unilateral lymphadenopathy seen in 16.4 %of patients.

In our study, the investigation modalities used diagnose lung cancer were precisely depending on the site of lesion. In our study, 73.6% were diagnosed by bronchial biopsy followed by 20.9% needed CT guided lung biopsy. Thoracoscopy was done in 3.6% patients. Similar findings were also described in other studies[49,55].

In this 71.0% were diagnosed as ADC, 20.80% were diagnosed SqCC, 5.45% were diagnosed as SCLC while 2.75% were undifferentiated. The pattern of lung cancer is changing in the well-developed countries. ADC has overtaken SqCC as the most common histological cell type. Which is similar to study of Rami-P et.al.[15]and malik M. etl.al.

The reason behind this histological shift in the developed countries is due to changes in the smoking behavior of the population, method of manufacturing and composition of cigarettes being marketed in these regions. Use of Cigarettes with filter was more deeply inhaled that result in deposition of carcinogen more peripherally, giving rise to ADC. The changes in cigarette composition (lower tar and nicotine and higher nitrates) has reduced the yield of carcinogenic polycyclic aromatic hydrocarbons (PAHs),

In India, Malik p and Dhandapani S et al[16] reported that ADC was the commonest cell type. This may be because these studies are conducted in metropolitan cities like New Delhi and Chennai where urbanization, environmental exposure to other carcinogens and increasing filter cigarette use were the prevailing factor contributing to this finding.

CONCLUSION:

In our study, ADC was the most common variety. The higher prevalence was seen in smoker and male gender. Guided biopsy is one of the key factor for diagnosis. Radiologically mass lesion remains the most common presentation.

Table no. 1 Distribution of participants according to radiological finding.

Findings	Frequency	Percent
Left hilar Mass	18	16.4
Left Upper & Mid lobe Consolidation	9	8.2
Left Upper lobe Mass	9	8.2

Left Upper lobe with effusion	9	8.2
Right Hilar Mass	20	18.2
Right Middle lobe Mass	9	8.2
Right Para tracheal + Hilar Mass extend to SVC	9	8.2
Right Upper lobe & Hilar mass	15	13.7
Right upper lobe mass	8	7.2
Right Upper lobe Mass with pl. effusion	4	3.6
Total	110	100.0

Table no.2 Dagnostic procedure between small cell carcinoma and non-small cell carcinoma

Procedure	Small cell Carcinoma (N=7)		Non-small cell Carcinoma (N=103)		Total	
	Count	%	Count	%	Count	%
Bronchial Biopsy	6	5.45	75	68.18	81	73.6
CT Guided Biopsy	1	0.91	22	20.00	23	20.9
Thoracoscopy	0	0.00	4	3.64	4	3.6
Total	7	6.36	103	93.64	110	100.0

Table no.3 ECOG score of cases

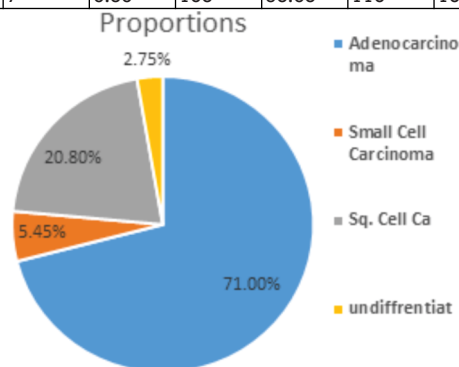| ECOG	Small cell carcinoma		Non-small cell carcinoma		total	
	Count	%	Count	%	Count	%
1	1	0.91	42	38.18	43	39.1
2	3	2.73	19	17.27	22	10
3	3	2.73	24	21.82	27	24.54
4	0	0.00	18	16.36	18	16.36
Total	7	6.36	103	93.63	110	100

Figure no.1 Distribution of participants according to diagnosis

Conflict of Interest = No

Acknowledgment = No

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