ORIGINAL ARTICLE ASIAN JOURNAL OF MEDICAL SCIENCES

Clinical profile of lung cancer in Southern India with special reference to initial presentation and acceptance of treatment: A single-center study

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Submission: 27-08-2024 Revision: 28-09-2024 Publication: 01-11-2024

ABSTRACT

Background: Lung cancer ranks as the second-most common cancer globally and remains the leading cause of cancer-related deaths. Despite a global decline in mortality due to reduced smoking, its incidence is rising in India. **Aims and Objectives:** This study retrospectively examines the clinical profiles of lung cancer patients at their initial presentation and treatment acceptance. **Materials and Methods:** This retrospective analysis used a database of 185 lung cancer patients reported at the Regional Cancer Centre, Tirunelveli, from January 2021 to December 2022. Clinical records of confirmed lung cancer cases were reviewed, focusing on demographic details, smoking history, symptoms, radiographic findings, histopathology, and clinical staging. Most patients underwent fiberoptic bronchoscopy or fine-needle aspiration biopsy. Patients were classified based on morphology and assessed using the modified Karnofsky Performance Scale and Eastern Cooperative Oncology Group (ECOG). **Results:** Most patients were male (74.5%), with a median age of 61 years. Most had an ECOG performance status of 0–2 (82.7%). Smoking was prevalent, with 53% of patients being current smokers. The most prominent symptoms at initial presentation were cough, dyspnea, fatigue, and weight loss. Adenocarcinoma was the predominant pathological type (47%). The right lung was more frequently affected, and most patients had comorbid conditions. Paclitaxel plus carboplatin was the primary first-line chemotherapy for most patients. A significant proportion (68.1%) were diagnosed at Stage IV, with the lung being the most common site of metastasis (46.8%). **Conclusion:** Most cases are diagnosed at advanced metastatic stages due to delayed diagnosis, often being initially misdiagnosed as tuberculosis.

Key words: Lung cancer; Clinical profile; Southern India; Initial presentation; Treatment acceptance; Adenocarcinoma

Access this article online

Website: http://nepjol.info/index.php/AJMS

DOI: 10.3126/ajms.v15i11.69380

E-ISSN: 2091-0576

P-ISSN: 2467-9100

INTRODUCTION

Lung cancer is the second-most commonly diagnosed cancer and the top cause of cancer-related deaths worldwide. The GLOBOCAN Report 2020 revealed that approximately 2.2 million people were diagnosed with lung cancer (representing 11.4% of all cancer cases) and 1.8 million deaths were due to it, accounting for 18% of all cancer-related deaths. In India, 72,510 new lung cancer cases (5.5% of all cancers) were reported in 2020, with 51,675 (8%) occurring in males.[1] Furthermore, lung cancer caused 66,279 deaths, which is 7.8% of all cancer-related deaths.

Despite a worldwide decline in lung cancer mortality likely due to decreased smoking rates, its prevalence appears to be increasing in India.[2] The Indian Council of Medical Research documented 57,795 new lung cancer cases in

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2012, which rose to 72,510 by 2020, with an estimated 103,371 cases for both sexes combined.[3,4] The significant mortality rate linked with this disease highlights its importance as a public health concern.

Lung cancer is mainly categorized into non-small-cell lung cancer (NSCLC) and small-cell lung cancer (SCLC). However, this broad classification is insufficient. Further, comprehensive subclassification based on mutational analysis, such as epidermal growth factor receptor, anaplastic lymphoma kinase rearrangements, ROS-1 translocation, or programmed death receptor 1 (PD 1)/PD ligand 1 expression, is crucial for targeted therapy or immunotherapy. The NSCLC histologically also evolved, with adenocarcinoma (ADC) now equaling or even surpassing squamous cell carcinoma (SCC) in prevalence in many Western and Asian countries.[5,6]

However, the clinicopathological characteristics of lung cancer in India show significant variability. Factors such as social and environmental influences affect the proportions of different histopathological lung cancer types. Patients' initial presentation to oncologists also varies due to social, demographic, geographic, and environmental factors. We retrospectively analyzed the clinical profiles of lung cancer patients at their initial presentation and treatment acceptance at the Department of Medical Oncology, Regional Cancer Center, Tirunelveli, Tamil Nadu.

Aims and objectives

To study the clinical profile of lung cancer patients with respect to their presentation and acceptance of treatment.

MATERIALS AND METHODS

This retrospective study analyzed data from 185 lung cancer patients treated at the Department of Medical Oncology, Regional Cancer Center, Tirunelveli, Tamil Nadu, between January 2021 and December 2022.

Inclusion criteria

1. Patients with histologically proven non-small-cell lung carcinoma
2. Age 18–85 years
3. Study duration period between January 2021 and December 2022.

Exclusion criteria

1. Small-cell lung carcinoma
2. Age below 18 years and above 85 years
3. Thoracic metastatic disease from non-pulmonary sites.

Patients' clinical records were examined for demographic details, smoking history, duration of symptoms, imaging-based findings, histopathological, and clinical staging. Patients with confirmed histopathological findings with records were included in the study.

The classification of patients was done morphologically according to the WHO classification of lung tumors into (1) non-small-cell lung carcinoma (SCC, ADC, and NSCLC-not otherwise specified (NSCLC-NOS); (2) SCLC; and (3) miscellaneous tumors.[7] The patient's performance status was evaluated using the Eastern Cooperative Oncology Group (ECOG) scale.[8] The study received approval from the Institute's Ethical Committee, and all data are presented as frequencies and percentages.

RESULTS

The study population consisted mostly of males (74.5%), with a median age of 61 years (range: 26–79 years). 12% (22 patients) were younger than 50 years. Most patients had an ECOG performance status of 0–2 (82.7%, 153 patients), with 15.2% (28 patients) having an ECOG performance status of 0–1, and 17.3% (32 patients) having a poor performance status at presentation (ECOG: PS 3–4). Current smokers comprised 53% of the patients, former smokers 11.9%, and never smokers 35.1%. Among male patients, 85.5% were smokers, whereas 95.7% of female patients were non-smokers. Heavy smokers (smoking index >600) constituted 29.1%, and 62.5% had a smoking index between 100 and 600.

The main symptom at initial presentation was cough (80%), followed by dyspnea (70%), tiredness (60%), weight loss (58.9%), chest pain (49.1%), and hemoptysis (32.4%). Superior vena cava obstruction was observed in 4.8% of patients. The other prominent physical signs were clubbing (17.8%), lymphadenopathy (12.4%), and neurological findings (5.9%).

The primary diagnostic methods were computed tomography (CT) or ultrasound-guided interventions (46.5%), flexible bronchoscopy (37.8%), pleural fluid analysis and thoracoscopic biopsy (9.7%), followed by nodal fine-needle aspiration cytology/biopsy (4.3%). ADC (47%) was the most common pathological type, followed by SCC (37.2%), NSCLC NOS (4%), and SCLC (10.8%).

The right lung was affected more frequently (63.7%), with the right upper lobe being the most commonly involved. Of these, 7.5% had predominant mediastinal involvement. A total of 40.5% (n=75) of the patients had comorbid conditions, such as hypertension, hypothyroidism, coronary artery disease, and chronic obstructive pulmonary disease. Most patients were either illiterate or had received primary education (75.1%). Only 4.86% of the patients

graduated. The majority of the patients had a lower-middle socioeconomic status (95%). Most of the patients were farmers and laborers by occupation (62.2%) (Table 1).

Most patients were diagnosed at advanced stages, with 68.1% at Stage IV and 29.7% at Stage III. The highest metastatic sites were lungs (46.8%), followed by bones (30.9%), liver (24.6%), brain (16.6%), and adrenal glands (11.9%). Multiple site metastases were observed in 41.2% of patients (Table 2).

Of the 185 patients, 81.1% were fit for cancer-directed therapy, whereas 18.9% received supportive care alone. Ten patients (8.5%) died without receiving cancer-directed treatment. Among eligible patients, 86.6% received systemic chemotherapy, 3.7% received chemoradiation, and 1.6% received targeted therapy. Only one patient underwent surgery. Patients received systemic chemotherapy cycles of <5 (45%) and 33% (41) patients received more than one line of chemotherapy (Table 3).

Table 1: Baseline and demographic characteristics

Variables	Subgroups	Numbers (%)
Age (years)	<50	22 (11.8)
	50–70	139 (75.1)
	>70	24 (12.9)
Sex	Male	138 (74.5)
	Female	47 (25.4)
Performance status (ECOG)	0–1	28 (15.2)
	2	125 (67.5)
	03-April	32 (17.3)
Smoking status	Never smoker	65 (35.1)
	Current smoker	98 (53)
	Formal smoker	22 (11.9)
Smoking status by gender	Male	20 (14.4)
	Female	45 (95.7)
Smoking index	<100	10 (8.3)
	100–600	75 (62.5)
	>600	35 (29.1)
Diagnostic modality	Bronchoscopy	70 (37.8)
	Image-guided transthoracic FNAC/Biopsy	86 (46.4)
	Thoracentesis	18 (9.7)
	Peripheral lymph node	8 (4.3)
	Others	3 (1.6)
Pathological type	Adenocarcinoma	87 (47)
	Squamous cell carcinoma	69 (37.2)
	Non-small-cell lung carcinoma-NOS	7 (3.7)
	Small-cell lung carcinoma	20 (10.8)
	Others	2 (1)
Predominantly involved lobe	Right	118 (63.7)
	Upper lobe	50
	Middle lobe	30
	Lower lobe	38
	Left	67 (36.2)
	Upper lobe	30
	Lower lobe	37
Stage	I	2 (1)
	II	2 (1)
	III	55 (29.7)
	IV	126 (68.1)
Education	Illiterates	28 (15.1)
	Primary	111 (60)
	Matric	37 (20)
	Graduate	9 (4.8)
Occupation	Farmers	62 (33.5)
	Factory workers	48 (25.9)
	Households	28 (15.1)
	Others	47 (25.4)
Socioeconomic status	Low	86 (46.4)
	Middle	89 (48.1)
	High	10 (5.4)

ECOG: Eastern Cooperative Oncology Group, NOS: Not otherwise specified, FNAC: Fine-needle aspiration cytology

DISCUSSION

This retrospective analysis assessed the clinical spectrum of lung cancer patients at a regional cancer center in South India. The median age of the patients was 61 years, consistent with previous Indian studies,[9-14] but nearly a decade younger than Western populations.[15-17]

Males were more frequently affected than females (3:1), reflecting higher smoking rates among males.[11,18-21] The proportion of female patients has increased significantly over the years, possibly due to better medical attention or due to other risk factors exposure.

The majority of patients (67.5%) presented with an ECOG performance status score of 2, indicating advanced disease at diagnosis. This is lower than the performance status seen in other studies, which may be contributes due to the advanced stage of the disease at diagnosis.[13,14]

Smoking was prevalent among 64.8% of patients, predominantly males, this is almost similar results to other Indian studies but compared to the Western population was less.[11,12,15-17] The prominent histological type was ADC, followed by SCC and small-cell carcinoma, NSCLC-NOS type was much less reported due to advancement in pathological reporting techniques and updated reporting guidelines.[19] This shift toward ADC aligns with global trends but contrasts with earlier Indian studies that reported SCC as more common.[22-27]

The most common diagnostic methods were CT- or ultrasonography-guided biopsy (46.50%) and flexible

Table 2: Metastatic site details

Metastatic site	Numbers of patients (%)
Lung	60 (46.8)
Bone	38 (30.9)
Liver	31 (24.6)
Brain	21 (16.6)
Adrenal	15 (11.9)
Multiple sites	52 (41.2)

Table 3: Chemotherapy details

No. of chemotherapy cycle	1 cycle	2–5 cycles	6 cycles	7–18 cycles	On maintenance therapy
No. of patients	17	37	19	41	16

bronchoscopy (37.8%). Pleural fluid analysis was also performed in 9.7% of patients. Newer techniques such as EBUS are currently not available at our center but will be available shortly.

The low literacy rate among patients (75.1% had primary education or less) may contribute to delayed diagnosis and advanced disease stages at presentation and because of delay in diagnosis, most patients presented in a poor general condition which leads to difficulty in delivering cytotoxic chemotherapy, and ultimately responsible for poor outcomes in these patients.[22,23] The majority of patients were farmers or laborers, reflecting lower socioeconomic status. This study highlights the importance of improving thoracic oncology facilities and raising awareness about lung cancer to facilitate early diagnosis and treatment.

Limitations of the study

This was a retrospective study with a limited number of patients. Additionally, a molecular study for targeted therapy was not feasible in this study population.

CONCLUSION

Lung cancer remains a significant health concern in India, with most patients diagnosed at advanced stages. Factors contributing to delayed diagnosis include low educational levels, misdiagnosis, and lack of awareness. Improving diagnostic facilities and public awareness is crucial for early detection and treatment of lung cancer.

ACKNOWLEDGMENT

I thank all my departmental staff and colleagues for their assistance in obtaining the medical records of the study population.

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Source of Support: Nil, **Conflicts of Interest:** None declared.