



Epidemiological, Clinico-Pathological Profile of non-small cell Lung Carcinoma at Tertiary Health Care Hospital

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Abstract

Background: Lung cancer is one of the commonest and most lethal cancers throughout the world. The epidemiological and pathological profile varies among different ethnicities and geographical regions. At present Adenocarcinoma is the commonest histological subtype of non-small cell lung cancer (NSCLC) in most of the Western and Asian countries. However, in India Squamous cell carcinoma has been reported as the commonest histological type in most of the series. The aim of this analysis was to study the current clinicopathological profile of lung cancer patients at our centre, K.R. Hospital, Mysore.

Materials and Methods: We analyzed pathologically confirmed lung cancer cases registered at our centre over a period of three years. They were evaluated for their clinical and pathological profiles, treatment received and outcome. **Results:** The median age of the study population was 56.5 years (35-90years). Male to female ratio was 3.8:1. There were 44 (91.67%) cases of NSCLC and 4 (8.33%) cases of SCLC. Among NSCLC, 70.45% patients were of stage IV. Early stage (I-IIIa) was present in only 9.08% of the patients. 5 patients (11.36%) had stage IIIB disease. Similarly among SCLC, 75% patients had extensive disease while only 25% patients presented with limited stage disease.

Conclusion: The study showed that the most common type of lung carcinoma in Mysore is NSCLC, with Adenocarcinoma running in close second. Moreover, there is an alarming rise in female lung cancer patients which also points out towards the need of studies aiming at etiological factors responsible for this rise.

Keywords: Lung cancer, Clinicopathological Profile, Pathology Review, NSCLC, Survival, Mysore, India.

Introduction: Cancer known medically as a malignant neoplasm, is a broad group of diseases involving unregulated cell growth. In cancer, cells divide and grow uncontrollably, forming malignant tumors, and invading nearby parts of the body. The burden of cancer is still increasing worldwide despite

advances in diagnosis and treatment, with an estimated 14.1 million new cancer cases and 8.2 million cancer-related deaths occurred in 2012 compared with 12.7 million and 7.6 million, respectively, in 2008.¹ The most common causes of cancer deaths were carcinomas of the lung (1.6 million, 19.4% of the total), liver (0.8 million, 9.1%), and stomach (0.7 million, 8.8%).^{1,2}

Lung cancer is the uncontrolled growth of abnormal cells that start off in one or both lungs; usually in the epithelial cells that line the air passages. Tumors that remain in one place and do not appear to spread are known as “benign tumors”. Malignant tumors, the more dangerous ones, spread to other parts of the body either through the bloodstream or the lymphatic system or through the direct local invasion. About 8% of lung cancer is due to

inherited factors.³ In relatives of people with lung cancer, the risk is increased 2.4 times. This is likely due to a combination of genes.⁴ Polymorphisms on chromosomes 5, 6 and 15 are known to affect the risk of lung cancer.⁵

Primary lung cancer originates in the lungs, while secondary lung cancer starts somewhere else in the body, metastasizes, and reaches the lungs. They are considered as different type of cancers and are not treated in the same way.

Material And Methods

The patients diagnosed of lung cancer in K.R. Hospital and the sample size has been calculated based on the latest statistical data from the local cancer registry (Kidwai memorial institute of oncology)⁴

- Number of cancer patients registered during the period 1982-2004(22years)= 73524 cases
- Number of lung cancer cases registered during same period= 5000(6.8%)
- Number of estimated lung cancer cases in a year=227 cases

Approximately 50% of estimated lung cancer cases for 6years was our sample size for the period April 2016 to April 2022. The relevant data was collected from Medical Records Department of K.R.Hospital. Our Inclusion criteria included, All patients diagnosed with lung cancer radiologically and confirmed histopathologically in the period April 2016 to April 2022. The cases registered from April 2016 to April 2022 was studied retrospectively. Exclusion criteria included any lung carcinoma patient, aged less than 20-25 yrs. {lung carcinoma in this age group is rare}.

Radiological and bronchoscopic interventions, CT guided biopsy was done if required. Ethical clearance was taken from the Institutional Time Bound Research Committee. Permission for viewing case records was obtained from the institute's committee and the medical record department.

Data regarding patient's age, gender, address, occupation, chief presenting complaints, dietary habits, substance abuse, co morbidities, lymph node enlargement, diagnostic reports, metastasis pattern, staging etc were collected from MRD, K.R. Hospital. Confidentiality of the patient's identity was thoroughly maintained.

Statistical Analysis

Descriptive statistics was used for describing demographic and clinical characteristics and is compiled in table 1.

Results

A total of 48 confirmed lung cancer cases over a period of 3 yrs (October 2013-october 2016) were available for clinicopathological analysis during the study. The median age of the study population was 56.5 years (35-90years). Majority

of the patients were between 41-70 years of age. Male to female ratio was 3.8:1 (38 male patients versus 10 female patients). 38 patients (79.1%) were from village. Out of the total population, 34 patients (77.27%) were smokers (active or former), out of which 10 patients (29.4%) were alcoholic too. Beedi (an indigenous form of tobacco) was the commonest mode of smoking (70.5%). There were 44 (91.67%) cases of NSCLC and 4 (8.33%) cases of SCLC. The diagnosis were predominantly based on FNAC (65.9%) followed by bronchoscopic lavage cytology (29.54%). Among NSCLC, 70.45% patients were of stage IV. Early stage (I-III A) was present in only 9.08% of the patients. 5 patients (11.36%) had stage IIIB disease. Similarly among SCLC, 75% patients had extensive disease while only 25% patients presented with limited stage disease. Baseline

Table 1: Demographic details

Feature		NSCLC n=44(%)	SCLC n=4(%)
Age	Median (Range)	60(40-90)	66.5(35-78)
	<=40	2(4.54)	1(25)
	41-50	12(27.27)	0
	51-60	12(27.27)	1(25)
	61-70	9(20.45)	0
	>70	9(20.45)	2(50)
Sex	Male	34(77.27)	4(100)
	Female	10(22.73)	0(0)
Geographical Distribution	City	9(20.45)	1(25)
	Village	35(79.55)	3(75)
Smoking	Smoker	21(47.72)	3(75)
	Non-Smoker	14(31.8)	0(0)
	Smoker+Alcoholic	9(20.45)	1(25)
Type of smoking	Beedi	21(70)	3(75)
	Cigarette	6(20)	1(25)
	Non-Specified (NS)	3(10)	0(0)
Pathological Subtype	Squamous Cell Carcinoma	23(4.54)	
	Adenocarcinoma	25(56.81)	
	Non-Specified(NS)	13(29.54)	
	Small Cell Carcinoma		
Method of Diagnosis	Biopsy	2(4.54)	0(0)
	FNAC	25(56.81)	4(100)
	Bronchoscopic Levage	13(29.54)	0(0)
	Non-Specified(NS)	4(9.09)	0(0)
AJCC Staging (7 th Edition)	IA	0(0)	
	IB	0(0)	
	IIA	0(0)	
	IIB	2(4.54)	
	IIA	2(4.54)	
	IIIB	5(11.36)	
	IV	31(70.45)	
	Non-Specified (NS)	4(9.09)	
	Limited		1(25)
Extensive		3(75)	

Table 2: Metastasis pattern table

Metastasis	NSCLC (%) n=31	SCLC (%) n=3
Hepatic	9 (29.03)	1 (33.33)
Brain	6 (19.35)	1 (33.33)
Adrenal	3 (9.67)	0 (0)
Vertebral	3 (9.67)	0 (0)

Others	4 (12.9)	0 (0)
Multiple	6 (19.35)	1 (33.33)

demographic details according to main pathological subtypes are summarized in Table 1 and 2.

Clinical presentation: Most common presenting symptom in both NSCLC and SCLC was blood in cough, haemoptysis (70.45% and 50% respectively) followed by chest pain and breathlessness (43.18% and 50%). Fever was present in 15.90% patients of NSCLC and 25% of SCLC. Pleural effusion was present in 27.27% of NSCLC. Most common site of metastasis was liver (29.03%) and brain (19.35) in NSCLC, while most commonly multiple metastasis was seen in SCLC. Adrenal metastases were present in 9.67% cases of NSCLC.

Discussion

The aim of this analysis was to study the current clinicopathological profile of lung cancer patients at our centre, K.R. Hospital, Mysore and to ascertain the need of a cancer research centre in Mysore. A total of 48 confirmed lung cancer patients who were diagnosed over a period of 3 years were analyzed. As compared to Western population, median age of our patients was a decade younger^{3,5,6} Most of the previous studies Indian have reported the similar median age^{3,5}

Smoking is associated with most of the lung cancer cases^{6,7} In our study, we found that up to 77.27% patients were smokers (current or former). Majority were bidi smokers which is an indigenously prepared, unfiltered and crude form of tobacco smoking prevalent mainly in the rural population. Previous Indian series have shown that majority of patients with lung cancer were bidi smokers.^{8,9,10,11,12}

Over last few years there has been a shift of histological profile towards Adenocarcinoma worldwide.^{3,13,14,15,16} In our study, we found squamous cell carcinoma to be the commonest histological subtype, accounting for 47.91% of all lung cancer cases coincident with most of the Indian series report. As a result of recent evolution in newer histology based treatment approaches, there is a need of proper histological sub typing of lung cancer.¹⁷ In our study we observed that up to 8.33% of lung cancer cases were still labeled with the generic term of NSCLC. In the present era of personalized treatment, there is a critical role of pathology review in lung cancer treatment.

Most of the patients in our study had advanced disease (stage IIIB-IV) at the time of presentation (81.81% in NSCLC and 75% in SCLC). In the series from west as well as from India, it is reported that 50-70% cases of NSCLC and up to 2/3rd of SCLC usually present in advanced stage.^{18,19,20,21}

Conclusion

Our study showed that the most common type of lung carcinoma in Mysore is squamous cell carcinoma (NSCLC), with Adenocarcinoma running in close second. Moreover, there is an alarming rise in female lung cancer patients which also points out towards the need of studies aiming at etiological factors responsible for this rise. Also, there is a need of early diagnosis and screening protocols as most of the lung carcinoma cases presented in late stage which was not amenable to any surgical intervention. There was no standardized clinicopathological profile of lung carcinoma in Mysore and this study report will be the cornerstone for further studies and researches in this field in Mysore.

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