

Epidemiological pattern of lung cancer in a tertiary care centre- A prospective observational study

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Abstract

Background: Lung cancer is a leading cause of morbidity and mortality worldwide. An increasing incidence of lung cancer has been observed in India. **Aim of the study:** To evaluate epidemiological profile of lung cancer in a tertiary care centre, South Kerala. **Methodology:** Prospective observational study, conducted at Medical College, Thiruvananthapuram, South Kerala, in 160 consecutive patients with histopathological diagnosis of lung cancer. Data on demography, symptoms, smoking status, physical findings, diagnostic modalities, histological diagnosis, and TNM stage were recorded using a structured questionnaire. For inferential statistics, comparison between groups of qualitative variables were analysed by chi-square test and quantitative variables were compared by student t test. P value of less than 0.05 was considered as level of significance. **Results:** Out of 160 consecutive lung cancer patients, 86.9% of patients were males. Male to Female ratio is 6.6: 1.50- 59 yrs was the commonest age group affected. 11.3% were nonsmokers. 67.5% of smokers were having smoking index more than 500. COPD was the commonest co morbidity (58%) in the study. Adenocarcinoma (41.9%) was the commonest histological type in our study and this was the commonest histological type seen in females and nonsmokers. In smokers, squamous cell carcinoma (91.3%) was more common. 66.9% of patients were at TNM stage 3 or 4 at the time of diagnosis only 5% of patients were in surgically resectable stage. **Conclusion:** It was found out that Adenocarcinoma was the most frequent histopathological type and majority of patients were at advanced stage at the time of diagnosis.

Keywords: Lung Cancer, Comorbidity, TNM Stage, Adenocarcinoma

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Introduction

Lung cancer has varied epidemiology depending on the geographic region. Globally, there have been important changes in incidence trends amongst men and women, histology, and also incidence in non-smokers [1]. Several epidemiological observations performed across varied demographic cohorts in India confirm the significant burden of lung cancer in India [2]. Smoking tobacco, both cigarettes and beedis, is the principal risk factor for causation of lung cancer in Indian men; however, among Indian women, the association with smoking is not strong, suggesting that there could be other risk factors besides smoking [2]. There is a dearth in our current understanding of the changing

epidemiological trends of lung cancer among Indian patients. While the global trend of a rise in adenocarcinoma appears to be paralleled in India, we do not completely understand the alarming rise in the incidence of lung cancer among the nonsmokers. [2]. The survey conducted in Uttar Pradesh by Misra and others showed that the incidence was 4.2 per 10,000 hospital admissions and 2.% of all malignancies [3]. As per data from the ICMRCancer Registry, males predominate with a male to female ratio of 4.5:1 and this ratio varies with age and smoking status. The ratio increases progressively upto 51 - 60 years and then remains the same. Upto 40 years of age, small-cell type predominates and has less association with smoking. After the age of 40 years, squamous cell type is the commonest in smokers and

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adenocarcinoma in nonsmokers [3]. The association of smoking and lung cancer is well known. The smoker to non-smoker ratio is high upto 20:1 in various studies. The risk increases with the amount and duration of smoking. In Indian patients with lung cancer, history of active tobacco smoking was found in 87% of males.

History of passive tobacco exposure is found in 3%. So 90% of all cases result from tobacco exposure [3]. Indian epidemiological data on lung cancer is scarce.

We conducted the study to evaluate epidemiological profile of lung cancer in a tertiary care centre, South Kerala.

Methodology

Aim of study. To evaluate epidemiological profile of lung cancer in a tertiary care centre, South Kerala.

Study Design. A prospective observational study over a period of two years.

Study Setting: Department of Pulmonary Medicine and Department of Oncology, Medical College, Thiruvananthapuram, Kerala, India

Study population: 160 consecutive patients with histopathological diagnosis of lung cancer.

Results

160 consecutive lung cancer patients were included.

Table-1: Age distribution.

Age (in years)	Frequency	Percentage
30 - 39	4	2.5
40 - 49	21	13.1
50 - 59	62	38.8
60 - 69	30	18.8
>= 70	43	26.9

50- 59 yrs was the commonest age group affected. Only 2.5% patients were below 40 years of age.

Table-2: Gender distribution.

Sex	Frequency	Percentage
Male	139	86.9
Female	21	13.1
Total	160	100

86.9% were males and 13.1% were females. Male: female ratio was 6.6 :1.

diagnosed at Pulmonary Medicine Department or cases of lung cancers referred from elsewhere to Department of Oncology, Medical College, Thiruvananthapuram, Kerala over a period of two years.

Inclusion criteria: All cases of lung cancer with histological proof, willing to participate in the study were included.

Exclusion criteria: Patients with malignancies other than lung cancer were excluded.

Data collection: Information on demography, symptomatology, physical findings, diagnostic modalities, histopathological type of lung cancer, extent of disease according to TNM classification, smoking status, comorbidities and treatment details, were collected by patient interview and medical records using structured questionnaire, after getting written consent from patients.

Institutional ethical committee clearance was obtained.

Statistical analysis: Data analysis was done using statistical package for social science (SPSS)-10 Version. For inferential statistics between groups, comparison of qualitative variables were analysed by chi-square test and quantitative variables were compared by student's t-test. P value of less than 0.05 was considered as level of significance.

Table-3: Smoking status.

History of smoking	Frequency	Percentage
Non smoker	18	11.3
50 - 200	13	8.1
200 - 500	21	13.1
500 - 1000	65	40.6
> 1000	43	26.9

88.7% were smokers and 11.3% were non smokers. Out of smokers, 67.5% were having smoking index more than 500.

Table-4: Frequency of comorbidities.

Comorbidity	Frequency	Percentage
COPD	93	58
Anaemia	80	50
Pulmonary TB (Treated/Untreated)	32	20
Asthma	5	3
Family History of Ca (GIT)	3	2
CAD	10	6

COPD is the commonest Co morbidity encountered (58%) followed by anaemia (50%)

Table-5: Histological pattern.

Histology	Frequency	Percentage
Squamous cell carcinoma	46	28.8
Adino carcinoma	67	41.9
Small cell carcinoma	26	16.3
Large cell carcinoma	4	2.5
Non-specific	17	10.6

Adenocarcinoma was the commonest histological pattern in the study (41.9%) followed by squamous cell carcinoma (28.8%).

Table- 6: Staging of lung cancer.

TNM	Frequency	Percentage
Stage I	3	1.9
Stage II	22	13.8
Stage IIIa	15	9.4
Stage IIIb	21	13.1
Stage IV	49	30.6
Limited stage	5	3.1
Extensive stage	22	13.8
Stage unknown	23	14.4

57.5% of study population were at advanced stage at the time of diagnosis.

Table.7. Correlation of gender and histology

Sex	Squamous cell carcinoma	Adenocarcinoma	Small cell carcinoma	Large cell carcinoma	Non specific
Male	42 (91.3%)	50 (74.6%)	26 (100%)	4 (100%)	17 (100%)
Female	4 (8.7%)	17 (25.4%)			

Adenocarcinoma was the commonest histological pattern seen in females.

Table- 8: Smoking and histological pattern.

Smoking	Squamous Cell Carcinoma	Adino Carcinoma	Small Cell Carcinoma	Large Cell Carcinoma	Non-specific
Non Smoker	4 8.70%	14 20.90%	-	-	-
50-200	2 4.30%	9 13.40%	2 7.70%	-	-
200 – 500	5 10.90%	16 23.90%	-	-	-
500-1000	11 23.90%	17 25.40%	20 76.90%	4 100%	13 76.50%
> 1000	24 52.20%	11 16.40%	4 15.40%	-	4 23.50%
Chi square: 68.574; p<0.001					

Adenocarcinoma was the commonest histological type seen in non smokers. Among squamous cell carcinoma patients 91.3% are smokers.

Table.- 9. Treatment modalities.

Treatment	Frequency	Percentage
Surgery + Chemotherapy	8	5
Chemotherapy + Radiotherapy	152	95

Only 5% of patients were in surgically resectable stage. All patients received chemotherapy.

Discussion

Lung cancer has varied epidemiology depending on the geographic region. Globally, there have been important changes in incidence trends amongst men and women, histology, and incidence in non-smokers. Indian epidemiological data on lung cancer is scarce [1]. In the developed countries, incidence and mortality from lung cancer in females is rising, whereas it is declining in males [4,5]. Cigarette smoking is the main risk factor for lung cancer and tripling of the number of cigarettes smoked per day triple the risk, while tripling of the

duration of smoking was estimated to increase the lung cancer risk hundred fold (Doll, 1956). A meta-analysis of 41 studies of tobacco exposure shows that there is a relative risk of developing lung cancer of 1.48 in males and 1.2 in females [3]. There is global trend of rise in adenocarcinoma of lung. But various studies showed conflicting results regarding histopathological type of lung cancer in India [1,5]. This is a prospective study in 160 consecutive lung cancer patients over a period of two years to find out epidemiological pattern of

lungcancer in a tertiary carecenter in South India. In the study, 13.1% were females and 86.9% were males. Similar gender distribution was reported in the study by Yogeasha K.Set al [4]. Our study showed amale to femaleratio of 6.6 :1. But in thestudy by Noronha V et almale-to-female ratio was 3.5:1 [1]. JagdishRawat, et al reported a comparatively higher prevalence in male i.e., 8.2:1 [5].

In our study, the commonest age group affected was 50-59 years.Similar findingwas reported by Yogeasha K. Set al [4]. Only 2.5% patients were below 40 years of age in our study, where as it was 6.5% in a previous study [4]

In this study, 11.3% were non smokers, but in a study byYogeasha K.Set al24.6% were non smokers [4].

Out of smokers, 67.5% were having smoking index more than 500 in our study.Literature review also shows that the risk of lung cancer increases with the amount and duration of smoking[3].

COPD wasthe commonest comorbidity encountered (58%) in our study. IslamK M et alreportedthat 52.5% of lung cancer patients were having COPD [6].

Adenocarcinoma was the commonest histological pattern in the study (41.9%) followed by squamous cell carcinoma (28.8%) in our study,simillar to the results of previous studies. [1,7]. Among squamous cell carcinomapatients 91.3% are smokers. Previous studies also demonstrated the high incidence of squamous cell carcinoma in smokers [1,5]. In our study, 57.5% of study population were at advanced stage at the time of diagnosis, a finding similar to that reported by Noronha Vet al [1].Adenocarcinoma was the commonest histological pattern seen in female and in non smokersin the study as reported by earlier study [12].

In our study only 5% were at aresectable stage. Similar finding was reported by Noronha.Vet al where surgery was offered for 6%cases [1].

Conclusion

Majority of patients were males and smokers. Adenocarcinoma was the commonest histological

pattern in our study, and were at an advanced stage at presentation. So early evaluation of symptomatic smokers may help to diagnose malignancy at an early stage.

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Permission of IRB: Yes

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