ORIGINAL ARTICLE

Clinicopathological Profile of Lung Cancer – Changing Trends in India

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ABSTRACT

BACKGROUND: Lung cancer is one of the commonest malignant neoplasm and leading cause of cancer related death worldwide. The clinicopathological profile lung cancer varies according to geographical area and ethnicity. Adenocarcinoma had replaced squamous cell carcinoma as commonest histological subtype in most of countries, however in India, still squamous cell carcinoma is the commonest subtype. **AIMS & OBJECTIVES:** The Aim of the study was to analyze the clinico-radiological profile of lung cancer patients presented at our institute. **MATERIALS & METHODS:** 140 cases with clinico-radiological suspicion of lung cancer were evaluated and out of these, 110 histopathological proved lung cancer patients were included in the study. The results were analysed using appropriate statistical tests. **RESULTS:** Majority of the patients in the present study were male with Male: Female ratio of 5.6:1. Distribution of age varied from 13 to 90 years with mean age of 58.6 years. Smoking was the commonest risk factor found in 81.8% patients and majority of them were heavy smoker (71.8%). Cough was the most common symptoms (83.6%) followed by dyspnoea and chest pain. Adenocarcinoma was the commonest histological subtype found in 45 patients followed by squamous cell carcinoma (36 patients) and small cell carcinoma (22 patients). **CONCLUSION:** There is a shifting trend in clinico-pathological profile of lung cancer world wide and adenocarcinoma has replaced squamous cell carcinoma as commonest subtype which is consistent with our study also.

Keywords: Lung cancer, Clinicopathological profile, India

INTRODUCTION

Lung cancer is one of the commonest malignant neoplasm and leading cause of cancer related death world wide.[1,2]. Its incidence increased dramatically throughout the twentieth century and still is increasing as the twenty first century.[1] Globally Lung cancer accounts for 13% of all diagnosed cancers and 19.4% of all cancer related deaths.[3] In India also, it is commonest and most lethal cancer among male & accounts for 10.9 % of all cancer cases and 13.0% of all cancer-related deaths.[4] Primary lung cancers are divided into two main type, small cell carcinoma (SCLC) and non-small cell lung carcinoma (NSCLC). There are three major types of NSCLC namely Squamous cell carcinoma, adenocarcinoma & large cell carcinoma. In western countries and most of Asian counties, adenocarcinoma has replaced squamous cell carcinoma.[5] Most of Indian series have reported squamous cell carcinoma as the commonest subtype.[6,7] Significant difference in clinicopathological features have been observed in different geographical areas over the past 60 years and histopathological cell types may vary with the change of social and other environmental factors.[8] we undertook this study to analyse the demographic pattern, clinico-radiological presentation, pathological characteristics and stage presentation of lung cancer in Rajasthan, India.

AIMS & OBJECTIVES

To study the clinico-radiological & pathological profile of primary lung cancer patients presenting at Department of Respiratory Medicine and Chest & TB Hospital, Bari attached to R.N.T. Medical College Udaipur, Rajasthan (India)

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MATERIALS & METHODS

This is a prospective, observational and descriptive study, carried out in patients of primary lung cancer presented at our hospital. Detailed medical history of patients was taken regarding their clinical symptoms, past medical or surgical history, occupational history, personal history, family history and complete smoking history. In smoker, Smoking index is calculated by multiplying number of cigarette or bidi used per day with years of smoking.[16] After the basic haematological, radiological and microbiological investigations, those patients in which clinical & radiological findings were suggestive of primary lung cancer, were subjected to fiberoptic bronchoscopy (Olympus Video-bronchoscope with 150 CV processor) under conscious sedation. Whole tracheobronchial tree was examined and wherever possible bronchiolveolar lavage (BAL), bronchial washing, endobronchial biopsy and/or c- TBNA samples were collected and sent to pathology department, R.N.T. medical college, Udaipur for cytological and histopathological confirmation. Further investigation like pleural fluid cytology, FNAC of lymphnodes/lung mass and trucut biopsy of lung was performed whenever required depending upon the site of lesion. The negative slides were kept and reviewed by different pathologists for double confirmation to label as negative. TNM staging was done according to American Joint Committee on cancer (AJJC) staging system 7th edition based on the available clinical and radiological findings. Statistical analysis was done using appropriate computer software

RESULTS

Out of total 140 cases, 110 histopathologically confirmed cases were included in the study and analyzed, there were 94(85.5%) males and 16(14.5%) females and male to female ratio was 5.6:. Distribution of age varied from 13 years to 90 years with mean age of 59.1 years in male, 55.6 years in female and 58.6 years overall. Smoking was found as most important contributory factor in causation of lung cancer. Out of total study poulation 81.8% patients were the smokers while 18.2% were non smokers. The ratio of smoker to non-smoker was 4.5:1. In present study maximum number (79%) of Lung cancer had smoking index more than 300 and 10% had smoking index between 100-300. Most common constitutional symptom in study population was weight loss (57.3%) followed by anorexia (52.7%), weakness (48.2%) and fever (20%). Most common respiratory symptom was cough with or without expectoration that was present in 83.6% patients followed by dypnoea, chest pain and expectoration in 70.9%, 68.2% and 57.3% patients respectively. Hemoptysis and horseness of voice were not uncommon and seen in 24.4% and 19.1% patients respectively. Among extrapulmonary symptom, Hoarseness of voice was seen in 21% cases, Dysphagia and facial swelling were less common in our study and reported in 6.4% patients. Average duration of symptoms in our study was 4.4 months. Clubbing was the most common extra pulmonary manifestation in present study, detected in 30.9% patients followed by extrathoracic lymphadenopathy, SVC syndrome, Pancoast syndrome and Horner syndrome in 13.6%, 6.4%, 3.6% and 0.9% patients respectively. Radiological, most of the patients in current study had multiple findings, Mass was the most common radiological finding in present in 86% patients followed by pleural effusion in 24.5%, collapse in 16.4% and consolidation in 14.5%. Radiographic analysis of mass lesion revealed that in more than one third cases mass was present in upper zone (38.4) followed by hilar (22.1%) and mid zone (15.1%). Fiberoptic bronchoscopy with endobronchial biopsy and bronchial washing was most useful procedure which gives positive results in 51.8% and 55.5% patients with diagnostic yield of 84.1% and 55.1 % respectively. Transthoracic needle aspiration was the next most useful procedure with positive results in 15 cases (diagnostic yield = 78.9%). Pleural fluid cytology and Lymphnode FNAC were

positive in 10 and 6 cases with diagnostic yield of 41.7% and 85.7 %. Diagnostic yield was 100% for TBNA. Adenocarcinoma was the most common histological subtype found in 45(40.9%) patients followed by squamous cell carcinoma (32.7%) and small cell carcinoma (20%). Large cell carcinoma, carcinoid tumor and Primitive neuroectoderm tumor were also found in our study, however number were less. Among male patients of present study, squamous cell carcinoma and adenocarcinoma were found in equal frequency (36.2%) while in female, adenocarcinoma was most common (68%) histological subtype. Squamous cell carcinoma was most common histological type in smokers, while adenocarcinoma was most common histological subtype in non smokers. In younger patients of age below 20 years, PNET was the only histological type found while in age group 21-41, carcinoid tumor was the commonest subtype (66.6%) followed by adenocarcinoma (33.3). In older population, adenocarcinoma was commonest subtype in age group of 40-60 years (50%) while squamous cell carcinoma (39%) was more common subtype in patients above 60 years.

In present study, out of 88 Non Small cell carcinoma patients, 65.9% were having advanced stage carcinoma (stage III B and IV) and 34.1% having early stage (I-IIIA) at the time of presentation. Out of 22 confirmed cases of small cell lung carcinoma, 63.6% were having Limited stage disease and 36.4% were having extensive stage disease. Metastasis was found in 43.7 patients, including 22 patients with local metastasis and 30 patients with distant metastasis. Opposite lung (10.9%) was the commonnest site for the metastasis followed by liver in 10%, malignant pleural effusion in 9.1%, extrathoracic lymphnode in 9.1%, brain in 4.5, adrenal in 1.8% and skeletal metastasis in 1.8%.

Table1: Demographic Features

Feature		No. of Patients	Percentage
Gender	Male	94	85.5
	Female	16	14.5
Age	<20 Year	2	1.8
	20-40 Year	4	3.6
	41-60 Years	40	36.4
	61-80 Years	61	55.5
	>80 Year	3	2.7
Education	Literate	35	31.8
	Illeterate	75	68.2
Smoking Status	Non smoker	20	18.2
	Ex-Smoker	29	26.4
	Current	61	55.5
Smoking Index	<100	0	0.0
	100-300	11	10.0
	>300	79	71.8
Bmi	<18.5	72	65.5
	18.6-24.9	35	31.8
	≥25.0	3	2.7

Table2: Clinical Features

Feature		No. Of Patients	Percentage
Clinical Features	Cough	92	83.6
	Dyspnoea	78	70.9
	Chest Pain	75	68.2
	Expectoration	59	53.6
	Haemoptysis	27	24.5
	Weight loss	63	57.7
	Decreased Appetite	58	52.7
	Fever	22	20.0
	Horseness of voice	21	19.1
	Lymphadenopathy	15	13.6
	Clubbing	34	30.9
	Pallor	28	25.5
	SVC Syndrome	7	6.4
	Pancoast Synd.	4	3.6
	Horner Synd.	1	0.9
Diseased Side	Right	50	45.5
	Left	55	50.0
	B/L	5	4.5
Chest X ray Finding	Mass	86	78.2
	Pleural Effusion	27	24.5
	Collapse	18	16.4
	Consolidation	16	14.5
	Hilar prominence	12	10.9
	Mediastinal widening	11	10.9

Table 3 : Pathological Profile

Histopathological Type	No. of Patients	Percentage
Adenocarcinoma	45	40.9
Squamous Cell Carcinoma	36	32.7
Small Cell Carcinoma	22	20.0
Large Cell Carcinoma	3	2.7
Carcinoid Tumor	2	1.8
Primitive Neuroectoderml Tumor (Pnet)	2	1.8

Table4: Comparision of clinicoradilogical profile of Lung Cancer in recent past Indian studies

Name of Study	Total Cases	Demography			Histopathopathological Distrubution						
		M:F	Mean Age	Sm : Ns	denocarcinoma	QCC	CLC	SCL	Carcinoid Umor	ndifferenciated	Others
Baburao A. et al (2015)	96	3.1	-	2.3	28.1	47.9	12.0	3.1	-	-	-
Pandhi N. et al(2015)	150	2.7	59.3	1.5	54.0	62.0	20.0	4.0	-	7.0	-
Dubey N. et al(2015)	47	4.2	51.6	3.6	32.0	38.0	21.0	2.1	-	11.7	-
Sundaram V.et al(2014)	60	4.3	63.0	2.5	43.3	31.7	10.0	3.2	-	-	-
Malik PS et al (2013)	434	4.6	55.0	2.3	37.3	32.1	28.0	2.8	0.5	-	-
Mandal SK et al(2013)	466	1.1	-	3.7	30.8	49.1	14.8	3.7	-	1.5	-
Bhaskarpillai B. et al (2012)	281	6.0	-	4.3	10.7	13.9	5.7	-	-	-	-
Koul PA et al(2010)	462	6.1	57.6	4.5	3.0	67.5	20.8	1.5		18.0	19.4
Sheikh S. et al(2010)	700	6.9	57.8	2.1	2.6	71.2	20.8	1.0	1.0	0.5	1.0
Bhattacharyya et al (2010)	266	6.6	-	4.5	15.8	25.3	13.9	1.9		33.1	-
Rawat J et al(2009)	203	8.1	-	-	19.7	44.8	16.8	8.4	-	-	-
Khan et al(2006)	321	11.3	-	7.7	5.3	77.3	17.1	0.3	-	-	-
Prasad R. et al(2004)	400	5.2	-	2.5	18.5	46.5	18.2	4.0	-	12.8	-
Present study	110	5.6	58.1	4.5	40.9	32.7	20.0	2.7	1.8	-	1.8

DISCUSSION

Worldwide, histological profile of lung cancer patients is seen undergoing a changing trends and adenocarcinoma had replaced squamous cell carcinoma as predominant histological subtypes.[5,10,11] However, most of Indian studies still reports squamous cell carcinoma as a commonest type.[12,13,14] Viswanathan et al. (1962)[15], Shankar S et al. (1967)[16], Gularia et al (1971)[17], Malik et al. (1976)[18], Jindal and Behera et al.(1990)[13] from Chandigarh, Gupta RC et al. (1998)[19] and Bhattacharyya SK et al. (2010)[20] from India had reported squamous cell carcinoma as most dominant subtype. In our study, Adenocarcinoma was the most common histological subtype found in 40.9% patients followed by squamous cell carcinoma (32.7%) and small cell carcinoma (20%). Our results were in concordance with recent Indian study by Mandal SK et al. (2013)[21], Shankar S et al (2014)[22] and Sundaram V et al. (2014)[23] reporting adenocarcinoma as a commonest subtype. The shift in the incidence of squamous cell carcinoma to adenocarcinoma may be associated with the switch from non-filtered to filtered cigarettes and the depth of inhalation had been altered.[24] Smoke from filtered milder cigarettes may be more deeply inhaled that result in deposition of carcinogen more peripherally, giving rise to adenocarcinomas.[138] Reduction in the nicotine content may also promote deeper inhalation as smokers attempt to compensate. The changes in cigarette composition has reduced the yield of carcinogenic polycyclic aromatic hydrocarbons (PAHs), inducers of squamous cell carcinomas, but increased the yields of carcinogenic tobacco-specific N-nitrosamines (TSNAs) that are inducers of adenocarcinomas.[25]

CONCLUSION

Lung cancer is a rapidly progressive disease with very high mortality rate but treatment in early stage may give good prognosis. High risk patients having smoking history should be evaluated clinico-radiologically with high suspicion so that early diagnosis can be made and quality of life of patients can be improved. There is a shifting trend in pathological profile of lung cancer worldwide and Adenocarcinoma may be the commonest histological subtype in India also but analysis of a larger cohort from multiple institutions would reflect the true pattern.

LIMITATION

This study is based exclusively on patients attending our department, so results are not representative of whole community. Another limitation of study was that total number of study population which could be increased. Many patients were referred to higher centres for further evaluation and management due to lack of facilities like EBUS, PET scan and VATS in the

institute. Some patients left between the study due to some social and personal reasons.

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