Original Article

A clinicopathological study of lung cancer from south India

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Abstract

Introduction: Lung cancer is the most common male cancer. It is a highly fatal disease with mortality trends paralleling incidence. The 5 year survival rate is 5% in developing countries compared to 15% in developed nations. Notable differences in lung cancer trends have been observed globally and reasons for such observed trends are elusive. We sought to identify correctable factors that could improve survival in this highly fatal cancer. **Methods:** A retrospective analysis of medical records of 125 lung cancer patient were checked for demographic data, disease related information including clinical presentation. The collected data was analysed using SPSS software version 22. **Results:** The Mean age at presentation for the study group was 59. Male smokers were the commonest group and overall SCC was the predominant histological type. Adenocarcinoma was the commonest type among females (P=0.0006). Cough with expectoration was the commonest symptom (68%) at presentation. The image guided biopsy (IGBx) was the most effective diagnostic modality (85%) when compared to flexible bronchoscopy and this difference was statistically significant with P<0.001. Most of the patients presented with metastatic disease (66%) and only 28% had curable disease at presentation. Treatment completion rate was only 24%. **Conclusion:** Lung cancer in south India conforms to national trends. Our study shows only 24% of the patients complete the planned treatment protocol. It is important to identify reasons for the treatment defaults to improve survival from lung cancer.
Keywords: Lung cancer, clinic pathological, south India.

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INTRODUCTION

Lung cancer is the most common male cancer with an incidence of 50.4 per 100,000 population in eastern Asia. In 2012 GLOBOCAN reported an approximately 58% of lung cancers worldwide were from less developed countries. The age standardized incidence rates in India vary from 4-12 per 100,000 population. Lung cancer is a highly fatal disease responsible for one in five global cancer deaths. Mortality data in India parallels incidence data with 3-10 deaths per 100,000 population[1]. The 5 year survival rate is an appalling 5% in developing countries compared to 15% in developed nations. National cancer registry data 2009-20011 indicate lung cancer accounts for 6.9% of new cancer diagnosis and 9.3% of cancer deaths in both sexes[2]. Striking differences in lung cancer trends have been noted globally and India is no exception. An increasing trend in incidence has been noticed in cities like Chennai and Bengaluru[2]. The reasons for such observed trends are elusive and may be related to cultural, geographical or disease related factors. We sought to review our hospital data regarding lung cancer to hopefully identify correctable factors that could improve survival in this highly fatal cancer.

MATERIAL AND METHODS

A retrospective analysis of medical records of 125 lung cancer patient treated at our tertiary cancer care center in south India was done. Demographic data were collected; disease related information regarding clinical presentation was accrued. Patients presenting clinically as metastatic disease with unknown primary and histological evidences suggesting lung cancer but with no demonstrable lung

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tumor were excluded from the study. Duration of symptoms before diagnosis and referral was noted, information regarding coexistent pathologies like tuberculosis and chronic obstructive pulmonary disease collected from the records. As an institution policy all patients with a clinical suspicion of lung cancer undergo chest X ray, CT chest and bronchoscopic examination. Image guided biopsy from primary is done if the bronchoscopic examination fails to confirm the diagnosis or if additional tissue is required for pathological examination. Staging evaluation included an isotope bone scan, CT abdomen and MRI brain. Pathological confirmation of metastatic disease was required only for presentations with solitary metastasis, for patients with multiple metastasis unequivocal radiological evidence of metastasis was considered as confirmative of distant spread. All patients after stage assignment were discussed in a multidisciplinary meeting and an individualized treatment policy formulated. Management principles followed standard protocols. Data regarding completion of planned treatment were evaluated for defaults and the reasons for the same analyzed. Statistical analysis was done using SPSS software version 22. A P value of <0.05 was considered a statistically significant result. The student-t test was used for continuous variables and Fisher's exact test for categorical variables.

RESULTS

Table 1

Variable	Sample N (%)	P value
Age at presentation (yrs) 59.15 (CI:57	125	
Males 59.94 (CI:58	102(82%)	P=0.87
Females 55.15 (CI:51	23 (18%)	P=0.42
Squamous cell 60 (CI:58	58 (49%)	P=0.33
Adeno carcinoma 58 (CI:54	39 (33%)	
Small cell carcinoma 56.3 (CI:48	06 (05%)	
Histological types Squamous cell	58 (49%)	
Adeno carcinoma	39 (33%)	
Small cell carcinoma	06 (05%)	
PDC	04 (03%)	
Broncho alveolar type	03 (02%)	
Carcinoid	01 (0.8%)	
Large cell type	02 (1.6%)	
Missing data	07 (05%)	
Smokers Vs Non smokers	95 (76%) vs 30 (24%)	
	57(60%) SCC 15 (50%)	P=0.3
	22 (23%) Adeno 14 (46%)	P=0.2
	06 (06%) Small 0 (0%)	P=0.3
Males Vs Females	49 (51%) SCC 08 (34%)	P=0.25
	25 (26%) Adeno 14 (46%)	P=0.0006
Clinical stage I	0 (0%)	
II	07 (05%)	
III	35 (28%)	
IV	83 (67%)	
Metastatic sites Pleura	22 (26%)	
Bone	22 (26%)	
Abdomen (liver/adrenals)	20 (24%)	
Lung	18 (21%)	
Brain	15 (18%)	
Diagnostic modality		
Bronchoscopy Vs IGBx	19 (15%) vs 101(85%)	P<0.0001
Co existent Disease ATT	23 (18.4%)	
COPD	02 (01%)	
Treatment Data Surgery	05 (04%)	
Chemotherapy/radiotherapy	112 (90%)	
Treatment completed	30 (24%)	

The study group had 23 (18%) females and 102 (81%) males in a ratio of 1:4.5. The Mean age at presentation for the study group was 59.14 years (CI: 57.37- 60.91). The same for males and females were 59.9 (CI: 58-62) and 55.65 (CI: 50.60-60.62) years respectively. The age at presentation, when analyzed for the common histological types showed a mean of 60 yrs, 58 yrs and 56 yrs for squamous cell, adenocarcinoma and small cell carcinoma. The observed differences in age at presentation among the histological types was not statistically significant P=0.87, P=0.42 and P=0.33. Squamous cell histology (SCC) 58 (49%) was the commonest overall, followed by adenocarcinoma 39 (33%), small cell carcinoma 6 (5%) and others 10 (8%). Among females adenocarcinoma was the predominant histology (60%) noted and this observation was statistically significant with P=0.0006. Majority of the patients were smokers 95 (76%), only 7 (5%) males but all females in the study group were non smokers. Small cell carcinoma occurred exclusively in male smokers, while squamous cell histology predominated in the smokers, adenocarcinoma was the commonest among non smokers. However these differences were not statistically significant P=0.3 (small cell), P=0.2 (adeno) and P=0.3 (Squamous). Cough with expectoration was the commonest symptom (68%) at presentation, followed by breathlessness (36%) and chest pain (12%). The symptoms were present for a mean duration of 6 months before diagnosis and referral. Five patients (4%) presented with superior vena cava (SVC) syndrome and 2% with supraclavicular lymphadenopathy (SCN). A surprising number of 25(20%) patients were treated with anti tuberculous therapy (ATT) before a lung cancer diagnosis was confirmed. Chronic pulmonary disease (COPD) resulted in a delayed diagnosis in only 2 patients. The chest X ray and CT chest were suggestive of

lung cancer in all patients, however the bronchoscopy lead to a confirmative diagnosis in only 19 (15%) patients. The image guided biopsy (IGBx) was the most effective diagnostic modality (85%) when compared to flexible bronchoscopy and this difference was statistically significant with P<0.001. Most of the patients presented with metastatic disease 83(66%) and 35(28%) had locoregionally advanced disease at presentation. There were no patients with stage I disease and only 7(5%) patients presented with early disease suitable for surgery. An analysis of the metastatic sites revealed that most patients had multi systemic involvement with bone (26%), pleura (26%), abdomen (24%), lung (21%) and brain (18%) affected in combination. Chemotherapy and radiotherapy were the treatment modalities applicable to most patients; only five patients had disease and lung function permissible to undergo a lobectomy. No peri operative mortality was noted in this study, however only 30 (24%) patients in the entire study completed the planned treatment protocol. Deteriorating performance status and progressive disease were the primary reasons for the treatment default. The baseline characteristics and other study data with analysis are shown in Table:1.

DISCUSSION

Worldwide the epidemiological trends of lung cancer have shown several changes and published literature from India have also confirmed these observations[3,4]. In addition,our study has also collected several important treatment related data, the implications of which could possibly lead to enhanced cancer care. The average age of presentation noted in this study was 59 years and this is consistent with published data from other parts of the country[5-9]. There was no significant difference in age at presentation between the sexes and among the histological types. The ratio of affected female to males show wide national variation and our data of 1:4.5 is concordant with similar regional publications[7,9]. The nonsmokers to smokers ratio was 1:3 in the present study and this factor also shows minor nation variation, however the core observation of higher lung cancer among smokers continues to be preserved[5-9]. Squamous cell histology was the commonest overall, followed by adenocarcinoma which appears to be the predominant histology among affected women. Except for the study by Sundaram *et al* and Dhandapani *et al*. other similar studies have reported trends concordant with the present study, the reasons for this deviation noted by these two studies are unknown but may be related to the small sample size of these studies[5,6,8]. All patients had symptomatic disease with cough as the predominant symptom[5,9]. Despite an average duration of 6 months of symptoms, a majority presented with metastatic disease (66%) or locally advanced disease (28%). It is likely that symptoms occurred only late in the natural history of the disease or a delay in diagnosis due to coexistent diseases. About 20% of our patients were on anti tuberculous therapy indicating a delay in diagnosis seems likely due to symptom overlap with tuberculosis. This trend has been previously observed[10]. Our study also confirms emergency presentations of lung cancer like the SVC syndrome (4%) are rare. Flexible bronchoscopy has a poor diagnostic yield (15%) compared to image guided biopsy (85%) and this has been noted by other authors[9]. A higher proportion of metastatic disease compared to locally advanced disease was noted in our study, the reasons are unclear perhaps related to our protocol of routine metastatic evaluation as detailed in the methods section compared to other publications[5]. The distribution of metastatic sites conforms to nationally observed trends[5,6,8]. A low rate of curative surgery (5%) was noted with no surgical mortality reported. Most studies have failed to report on this issue, an unusually low operability rate reflects the late presentation of patients in this study and also perhaps, an inadequate lung function to undergo a major lung resection. Another important factor noted in our study was, only 24% of the study participants completed the planned treatment protocol with most defaulting due to deteriorating performance status and progressive disease. Cisplatin /etoposide was the commonest chemotherapy regime and geftinib was only selectively used. Performance status is a well established defining factor in the selection of appropriate chemotherapy regime, with tyrosine kinase inhibitors or single agent chemotherapy preferred for patients with poor performance status[11]. The reasons for this low treatment completion rate are unknown and are beyond the scope of this study but this issue requires further evaluation by a well a designed study.

CONCLUSION

Our study confirms lung cancer in south India conforms to national trends. This study shows only 25% of patients complete the planned treatment protocol and with 5 yr survival from lung cancer being only 5%, this issue has important implications in the overall survival outcome. It is important the etiology of factors leading to treatment defaults be analyzed by further clinical studies to improve mortality rate from lung cancer.

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