Physician Related Delays in the Diagnosis of Lung Cancer in India

KRISHNAPPRIYA RAMACHANDRAN[1], BALAMUGESH THANKAGUNAM[2], REKA KARUPPUSAMI[3], DJ CHRISTOPHER[4]

ABSTRACT

Introduction: Lung cancer is associated with a poor prognosis, if detected late in the disease course. Delay in seeking health care, wrong diagnosis and delay in specialist referral can contribute to delay in diagnosis.

Aim: This study was done to assess physician related delays in the diagnosis of lung cancer and the treatments given before presenting to our center.

Materials and Methods: A total of 96 consecutive patients diagnosed with lung cancer were enrolled in this study. Details of previous physician consultations, their specialization, diagnoses made and treatments given were obtained from records available with the patients.

Results: Patients, on an average consulted two physicians before presenting to our center. Less than half of the physicians

(45%) suspected lung cancer during their evaluation. Around 18% of physicians made an incorrect diagnosis of tuberculosis, out of whom, 88.6% had prescribed anti-tuberculous therapy. Only 27% of physicians referred the patients to higher medical centres for evaluation. Pulmonology Specialists (PS) were the most likely to diagnose lung cancer (p<0.0001). General Medicine Specialists (GMS) were the most likely to misdiagnose cancer as tuberculosis, followed by General Practioners (GP) when compared to PS (p-value =0.0422).

Conclusion: Our study demonstrates that, many physicians have a low index of suspicion to diagnose lung malignancy and most commonly misdiagnose it as tuberculosis. It is likely that most patients failed to seek the services of PS directly or through referral either due to a shortage of PS or due to other reasons.

INTRODUCTION

In India, lung cancer is the most common cancer as well as the most common tumor causing death in men. Lung cancer accounts for around 7% of all newly diagnosed cancer cases and 9.3% of all cancer related mortality in both sexes [1]. Survival in lung cancer depends on the stage of the disease at diagnosis [2]. Timely diagnosis remains critical to improve curability and prompt specialist referral is the most important pre-requisite for an early diagnosis [3].

Previous studies have shown that, most patients with lung cancer are diagnosed late in the disease course [4,5]. This could be due to a multitude of factors, such as patient related delay and lack of awareness leading to delay in seeking healthcare, inadequate or inaccessible health care facilities and physician related delays, like incorrect diagnosis and delayed referral to appropriate specialists. Data is lacking on physician related delays such as incorrect diagnosis and delayed referral in India.

We therefore, did this study to analyze the time to diagnose and assess physician related delays in diagnosis and the management plan/treatment given before presenting to our center.

MATERIALS AND METHODS

The study was conducted prospectively in the Department of Pulmonary Medicine at a Tertiary Care Hospital in Southern India between November 2006 and May 2007. All patients diagnosed with lung cancer in the department were included in the study after obtaining informed consent. Information was collected with regards to the clinical symptoms, their duration and other relevant information. Details of previous physician consultations,

their specialization/qualification, their diagnoses and the details of treatment received were obtained from records available with the patients. Non-allopathic practitioners were excluded from the study. Physical examination findings, histopathology, radiology reports and reports of other relevant investigations carried out at our center were collected.

The physicians who attended to the patient were classified according to specialization/qualification as:

1. General Practitioner (GP): Basic medical degree (MBBS) or degree in surgical or unrelated medical specialties.

2. General Medicine Specialist (GMS): MD (General internal medicine) and those with medical super specialties other than pulmonary medicine.

3. Pulmonology Specialist (PS): MD (Respiratory medicine or equivalent) who have had a 3 year specialty training or DM (Pulmonary Medicine or equivalent) who have had a 3 year specialty training, after 3 years of Internal Medicine training.

4. Respiratory Diploma (RD): A 2 year diploma in Tuberculosis and Chest Diseases (DTCD) or equivalent.

STATISTICAL ANALYSIS

The results were expressed in terms of frequencies and percentages for categorical variables. For continuous data, the mean and standard deviation was calculated. Chi-square test was used to assess the association between the physicians' specialization/qualification and their diagnostic accuracy. Statistical analysis was carried out using Statistical Analysis System (SAS) version 9.4.

RESULTS

A total of 96 patients were included in the study over the seven month study period and they had records of 196 physician consultations. Mean duration of symptoms at the time of consultation at our center was 5.8 months and 42 (43.8%) of the patients had consulted one, 28 (29.1%) consulted two, 13 (13.5%) consulted three, 6 (6.3%) consulted four physicians and 7 (7.3%) had consulted five physicians before coming to us.

The details of the physicians consulted are shown in [Table/Fig-1].

Qualification	n(%)*
General Medicine Specialist (GMS)	95(48.5)
General Practitioner (GP)	62(31.6)
Pulmonology Specialist (PS)	29(14.8)
Respiratory Diploma (RD)	10(5.1)
Total	196

[Table/Fig-1]: Qualification of physicians consulted.
*n (%) =number (percentage) of given characteristics

Diagnoses made by the physicians: A total of 22 (11.2%) physicians made a histological diagnosis of lung cancer and four had commenced chemotherapy. Although these patients were histologically confirmed cases, they consulted our center for a second opinion.

Overall, less than half of the physicians 88 (45%) suspected lung cancer. When looked at with respect to their specialization and qualification, 14 (22.6%) of the GPs, 4 (40%) of the RDs, 43 (45%) of the GMS and 27 (93.1%) of the PS had suspected lung cancer. Thus, PS appeared to be the most likely to suspect lung cancer compared to GMS and GPs (p<0.0001) [Table/Fig-2].

The most common misdiagnosis appeared to be smear negative pulmonary tuberculosis (18%), followed by Lower Respiratory Tract Infection (LRTI) (5.6%) and Chronic Obstructive Pulmonary Disease (COPD) (5.1%) [Table/Fig-3]. Of the 35 physicians (18%), who made a diagnosis of tuberculosis, 31 (88.6%) commenced Anti-Tubercular Therapy (ATT); (One physician made a correct diagnosis of lung cancer but decided to start the patient on concurrent ATT. Hence, the total number of physicians who started ATT was 32 as shown in the [Table/Fig-4].

Misdiagnosis of tuberculosis was made by 22 (23.1%) GMS, 12 (19.3%) GPs and 01 (3.4%) PS, suggesting that GMS were the

Qualification of Physicians	Diagnosis of lung cancer made n(%)†	Diagnosis of lung cancer not made n (%)	p-value*
Pulmonology Specialist	27(93.1)	2 (6.9)	
General Medicine Specialist	43(45.3)	52(54.7)	<0.0001
General Practitioner	14(22.6)	48(77.4)	
Respiratory Diploma	4(40)	6(60)	

[Table/Fig-2]: Association between qualification of physicians and diagnosis of lung cancer made.
*p value using Chi Square test.
†n (%) =number (percentage) of given characteristics

Diagnosis made	n(%)*
Lung cancer	88(44.9)
Tuberculosis	35(17.8)
Lower Respiratory Tract infection	11(5.6)
Chronic Obstructive Pulmonary Disease	10(5.1)
Pneumonia	8(4.1)
Vocal cord Palsy	7(3.6)
Cough of unknown etiology	7(3.6)
Others	30(15.3)
Total	196

[Table/Fig-3]: Diagnoses by physicians.
*n (%) =number (percentage) of given characteristics

Action taken	n (%)*
Referral	54(27.6)
Antituberculous treatment (ATT)	32(16.4)
Antibiotic treatment	23(11.7)
Ordered investigations	21(10.7)
Cough syrup	14(7.1)
Bronchodilators	8(4.1)
Chemotherapy	4(2)
Others	18(9.2)
Total	196

[Table/Fig-4]: Action taken by physicians– referral/treatments/investigations.
*n (%) =number (percentage) of given characteristics

Operability	Non small cell carcinoma n=91	Small cell carcinoma n=5
Operable	11 (IA-1, IB-4, IIA-1, IIB-4, IIIA-1)	Limited = 1
Inoperable	78 (IIIA-7, IIIB-31, IV-40)	Extensive = 4
Staging could not be ascertained	2	

[Table/Fig-5]: Details of staging and operability of lung cancer.

most likely to misdiagnose cancer as tuberculosis closely followed by GPs while PS were the least likely (p-value = 0.0422).

Diagnosis made by the physicians first consulted: A total of 38 (41%) out of 96 physicians first consulted suspected lung cancer at the patient's first visit; 23 (60.5%) of them made referrals to higher centers for further evaluation, 10 of them ordered further investigations to confirm the diagnosis (four obtained biopsy confirmation), 3 prescribed antibiotics empirically, one prescribed ATT and one prescribed only bronchodilators, despite suspicion of cancer. Misdiagnosis as tuberculosis was made by 20 (21.7%) and 38 made other misdiagnoses or referrals.

Referrals and treatment details: In all, 54 (27.6%) of the physicians referred the patients to higher medical centers; 33%, 20% and 26% of these were at first, second and third physician consultation respectively and 39 (72%) out of these physicians had suspected lung cancer before referral.

The treatment details provided by the physicians are tabulated in [Table/Fig-4]. The most frequently offered treatment was ATT, followed by antibiotics. A total of 21 (10.7%) ordered further investigations and had not commenced any treatment until the patients came to our center.

Disease stage at diagnosis: After complete evaluation, 40 (41.7%) patients had Stage IV and 31(33.3%) had Stage IIIB disease at the time of diagnosis. Only 11 (11.5%) patients were considered to have operable disease according to 1999 TNM staging [6] used in this study [Table/Fig-5].

DISCUSSION

Most of the patients had consulted an average of two physicians before coming to us. We looked at data from various Indian studies and this has been shown in [Table/Fig-6] [4,5,7-9]. Duration of time delay to diagnosis was shorter in most studies except Dubey et al., [5] which was similar to the delay in our study (around 6 months). Staging at diagnosis in other studies was similar to our study (74%- Stage IIIB, IV) except in Chandra et al., (90%) [9].

In a study done in Turkey [10], which included 101 lung cancer patients, 18.8% patients were examined by one physician, 42.6% by two, 26.7% by three, and 11.9% by four or more as compared to 43.8%, 28.1%, 13.5% and 7.3% patients respectively in our study. A large number of our patients consulted GMS and GPs, despite significant respiratory symptomatology, suggesting that these were more readily available options compared to PS. Only

Study	No of pts	Symptom to diagnosis delay	No. of pts misdiagnosed as TB n*and/or%†	Period of study	Stage of disease at diagnosis	Place of study	Type of study
Present study	96	5.8 months	29.2%	7 months (Nov 2006 -May 07)	40 (41.7%) stage IV 31 (33.3%) stage IIIB	Vellore, Tamil Nadu	Prospective
Yogeesha et al., [7]	61	3-4 months	TB - 3(5%), pneumonia-32(52%)	6 months (Aug 2013-Jan 2014)	Not specified	Karnataka	Retrospective
Rawat et al., [4]	203	4-6 months	Mentioned as majority of cases, numbers not specified	Jan 1998-Aug 2005	73.29% stage IIIB , IV	Uttarakhand	Retrospective
Rahul et al., [8]	170	3 months	43%	2 years	Not specified	Jammu	Prospective
Dubey et al., [5]	47	5.7 months	11 (23.4%)	1 year (2012-2013)	29 (65.8%), stage IIIB, IV	Madhya Pradesh	Prospective
Chandra et al., [9]	165	4.8 months	28 (17%)	Jan 2002 – Dec 2008	90.2% Stage IIIB, IV	New Delhi	Retrospective

[Table/Fig-6]: Comparison of the present study data with other Indian studies.
*n =number of given characteristics†%=percentage

15% of the patients consulted a PS, although they could be reached directly without GP referral in India.

Improvement in detection rates can be achieved by health education for the public as well as sensitizing doctors [3]. Unfortunately, less than half of the physicians (n=88, 44.9%) suspected lung cancer in our study while 35 physicians (18%), made an incorrect diagnosis of tuberculosis. Misdiagnosis accounted for significant delay in referral for confirmation of diagnosis and the most common misdiagnosis was tuberculosis. In two Indian studies, 17% and 22% of patients respectively with bronchogenic carcinoma were wrongly diagnosed initially as pulmonary tuberculosis and were prescribed ATT by the physicians [9,11]. In our study, this number was more; 29.2% patients were misdiagnosed as having tuberculosis and 27.1% were treated with ATT. The general tendency among physicians in India is to empirically diagnose tuberculosis much more commonly than cancer due to the high endemicity of tuberculosis and a shortage of diagnostic facilities for confirming the diagnosis of lung cancer using tools such as Computed Tomography (CT) guided lung biopsy and bronchoscopy [9]. Moreover, the Tuberculosis Control Programme advises physicians to commence empirical ATT for patients with lung shadows that don't resolve with antibiotic treatment. It is a widely held view that lung cancer diagnosis is a death sentence, with no curative treatment options. Many Indian physicians have a pragmatic approach of empirically treating for a curable disease and thus, antibiotic treatment, especially ATT is commonly used.

In a Brazilian study [12], only 24 (8%) patients were referred to a specialist following first contact with a physician while around 64% were referred after the third physician consultation. Pneumonia, chronic bronchitis and tuberculosis were diagnosed in 20%, 9% and 8% respectively. In our study, 32% of doctors referred the patients to higher centers at first consultation. In another study [13] done on 3855 patients with lung cancer, a specialist respiratory physician was involved in the initial management of 2,901 (75.3%) patients and the survival of these patients after 1 year of diagnosis was significantly higher (24.4 versus 11.1%).

In a Swedish study [14] done in 134 lung cancer patients, the median delay from the onset of the first symptom until, contact with the family doctor was 21 days, the median time to specialist referral was 33 days and the median time taken in establishing the diagnosis was nine days following the specialist visit. Overall, the median time from first symptom(s) until treatment or the decision not to treat was around six months. The delay was mostly due to the inadequacy of medical services, delay in referrals and in the performance of subsidiary tests. In our study, the average duration from the onset of symptoms to the consultation at our center was close to six months.

Early detection of lung cancer leads to better operability and improved outcomes [15,16], which in turn is dependent upon patient related delays and diagnostic delays [17]. The British Thoracic Society recommends immediate referral of patients with discernible evidence of lung cancer to a respiratory specialist [18]. Such a recommendation, we feel would be appropriate for India in the light of our study. In a retrospective study [17], lung specialist treatment delays did not correlate with poor prognosis in patients with late stage disease. However, this might be crucial in patients with early lung cancer where early detection and prompt treatment can lead to excellent outcomes.

LIMITATION

One of the limitations of the study was that we obtained information about previous physician consults from records that the patients had and thus, we could have missed a few. We also did not obtain details of physicians from alternate medical streams, who could also have been consulted. Thus, the number of physicians consulted before presentation to us could be an under estimate.

CONCLUSION

The study makes one wonder if there is an inadequacy of pulmonology specialists. Awareness has to be created among GPs and GMS about the early symptoms and signs of lung cancer and the need for prompt referral to a PS that would in turn assist in early histological diagnosis and a better chance of operability and cure.

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PARTICULARS OF CONTRIBUTORS:
1. Assistant Professor, Department of Respiratory Medicine, Meenakshi Medical College Hospital and Research Institute, Enathur, Kanchipuram, Tamil Nadu, India.
2. Professor, Department of Pulmonary Medicine, Christian Medical College and Hospital, Vellore, Tamil Nadu, India.
3. Senior Demonstrator, Department of Biostatistics, Christian Medical College and Vellore, Tamil Nadu, India.
4. Professor and Head, Department of Pulmonary Medicine, Christian Medical College and Hospital, Vellore, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Krishnappriya Ramachandran,
Assistant Professor, Department of Respiratory Medicine, Meenakshi Medical College Hospital and Research Institute,
Enathur, Kanchipuram, Tamil Nadu, India.
E-mail: drkpriya78@gmail.com

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