

Frequency of Tuberculosis in Patients with Lung Cancer

ANEEL KUMAR¹, RANIYAH AKHTER², NEELAM KHTARI³, NAUSHEEN SAIFULLAH⁴, NADEEM AHMED RIZVI⁵

^{1,2}Consultant Pulmonologists, Sindh Infectious Disease Hospital & Research Centre (DUHS), Karachi

³Postgraduate Trainee, ⁴Associate Professor, ⁵Professor (Rtd), Department of Pulmonology, Jinnah Postgraduate Medical Centre, Karachi

Correspondence to: Aneel Kumar, Email: dr.aneel@hotmail.com, Cell: 0333-7264064

ABSTRACT

Aim: To determine the tuberculosis frequency in lung cancer patients.

Study Design: Descriptive, cross-sectional study.

Place and Duration of Study: Department of Pulmonology, Jinnah Postgraduate Medical Center, Karachi from 11th September 2017 to 10th March 2018.

Methodology: One hundred and seventeen patients with lung cancer of age 30-60 years and both genders were enrolled. Patients with already taking anti-tuberculous therapy, previous history of tuberculosis, chest trauma and surgery were excluded. The relevant history, sputum or bronchial lavage sample was taken and presence or absence of pulmonary tuberculosis was noted.

Results: Mean age was 50.31±6.43 years and majority of the patients 99 (84.62%) were between 46 to 60 years of age. Seventy five (64.10%) were male and 42 (35.90%) were females. Mean duration of disease was 17.97±4.67 days. Tuberculosis in patients with lung cancer was found in 24 (20.51%) patients whereas 93 (79.49%) patients have no tuberculosis.

Conclusion: The frequency of tuberculosis in patients with lung cancer is quite high.

Keywords: Tuberculosis, Lung cancer, Morbidity

INTRODUCTION

By the start of twenty first century around 13% of pulmonary carcinoma has been reported. The mortality rate associated with this type of cancer has been recorded as above 1.5 million only in America until the year 2011.¹ Developing countries have recorded morbidity escalation through various other disease with highest reported through tuberculosis (TB).² Research evidence reports a strong association between tuberculosis and pulmonary cancers with a likelihood of raised cases of lung cancers in preexisting tuberculosis patients. Further an increased risk of lesions have also been reported in such cases.^{3,4}

Different studies report different incidence of tuberculosis in lung patients but it appears to be higher in these patients. It greatly varies from different geographical regions of the world. Relationship between tuberculosis and lung cancer has remained controversial.⁵ Some scientists have shown that tuberculosis promotes development of lung cancer while others contradicted this relation.⁶ Some research implicated that post-tubercular scars could develop lung cancer ("scar cancer"). However, information is scarce regarding disease outcome and characteristics of disease outcome is also limited.^{7,8} Prevalence of tuberculosis according to different studies is 41.67%⁹ and 12.5%.¹⁰

There is a long history of TB association with lung cancer with many studies emphasizing on presence of TB in association with cancer diseases. The occurrence of pulmonary TB (PTB) has become a significant topic through years of development and research. It is important to determine the association of these two diseases as it put a major burden on public health especially in low income countries.¹¹ Moreover, different studies report different frequency of TB and lung cancer and clinical representation is also different it is important to find out the characteristics in Pakistani population as we belong to different geographical area and also majority of our population belong to rural areas. I had planned to conduct this study to evaluate the frequency of tuberculosis in patients with lung cancer in local population. This study will help us to determine the magnitude of the problem as tuberculosis along with lung cancer is associated with poor prognosis. This study will help us to design our routine practice guidelines for early recognition and management of this condition in order to reduce the mortality and morbidity of community.

MATERIALS AND METHODS

This descriptive, cross-sectional study was conducted at Department of Pulmonology, Jinnah Postgraduate Medical Center Karachi from 11th September 2017 to 10th March 2018 and 117 patients were enrolled. All patients with lung cancer <1 month duration, age between 30-60 years and both genders were

included. Patients already taking antituberculous therapy, previous h/o tuberculosis (assessed on medical record), history of chest trauma and history of any chest surgery were excluded. After taking informed written consent and relevant history, sputum or bronchial lavage sample was taken and presence or absence of pulmonary tuberculosis was noted. Statistical analysis was performed using SPSS-20.0.

RESULTS

The mean age was 50.31 ± 6.43 years and majority of the patients 99 (84.62%) were between 46 to 60 years of age. Seventy five (64.10%) were males and 42 (35.90%) females with male to female ratio of 1.8:1. Thirty eight (32.5%) patients have duration of disease ≤15 days and 79 (67.5%) patients have >15 days and mean duration of disease was 17.97±4.67 days. Tuberculosis frequency in lung cancer patients was found in 24 (20.51%) patients whereas 93 (79.49%) patients have no lung cancers (Table 1).

Table 1: Demographic information of the patients (n=117)

Variable	No.	%
Age (years)		
30-45	18	15.38
46-60	99	84.62
Gender		
Male	75	64.1
Female	42	35.9
Duration of Disease (days)		
≤ 15	38	32.5
> 15	79	67.5
Place of living		
Rural	58	49.6
Urban	59	50.4
Occupation		
Field	62	52.9
Office	34	20.0
Domestic	21	17.1
Family history of Tuberculosis		
Yes	69	58.9
No	48	41.1
Smoking		
Yes	64	54.7
No	53	45.3
Lung Cancer		
Yes	24	20.5
No	93	79.5

DISCUSSION

Cancer patients are mostly immune-compromised due to underlying condition and also due to diagnostic and therapeutic

interventions including chemotherapy. There are high chances of tuberculosis reactivation in lung cancer patients that required urgent screening. British health institute showed that, there is higher chances of tuberculosis development in patients who are going through chemotherapy and had a gastrectomy but not provide any proper and accurate screening test for diagnosis and prediction. American institutes of health including Centre for Disease Control and Prevention suggest and recommend LTB1 as a screening test in high risk patients.¹²

There was an extensive research within 1950s to 70s in the relevant context however these studies had undetailed methodological assistance. One of such limitation was description of TB frequency in malignant patients as cumulative incidence rather than incidence rate giving unadjusted values for observational time and risk period involved. The calculation of relative risk was performed by dividing the cumulative incidence of TB in cancerous follow-up patients with the general population incidence rate or in some cases was not calculated ever.^{13,14} Meta analysis as well as systematic reviews by Cheng et al¹⁵ also presented discrepancies in methodology resulting in over estimation of the cases where general public was used as for comparison and no adjustment against potential confounders was made.

Primary cases of lung cancer and TB appeared in 1810 while later research presented no substantial inter-existing and correlating data considering both as independent variables.^{16,17} Recent year advanced research has contradictorily proved that TB as an independent variable has an ascending association with lung cancer and can be found in cases with already lung cancer suffering which may be arising through TB lesions or immune suppressive ailment. In contrast, a retrospective case-control study¹⁸ involving 36 patients with LC, 10 (27.8%) were diagnosed with tuberculosis and cancer concomitantly, whereas 26 (72.2%) were diagnosed with tuberculosis after being diagnosed with lung cancer.

A systematic research elaborated the incidence of TB only in pulmonary carcinoma patients while other studies have reported the incidence of TB in lung carcinoma case as between 12.5 to 41.6%.⁹⁻¹⁰ Other literature supports that 27.8% patients were having carcinoma when diagnosed with TB while others developed it on later stages.^{19,20} The present study only found 20.4% such patients who developed TB and were already suffering from lung carcinoma keeping in mind that the current study enrolled majority of the late middle age patients with higher percentage of males than females. Even the granulomas-microenvironment deregulation may causes TB events and bacterial invasion post cancer treatment or radiotherapies.²¹⁻²³

Within lung cancer, adenocarcinoma being more prominent as reported in various literatures. However, studies from Taiwan reports less frequency of TB in lung cancer patients with higher frequency of epidermoid carcinoma.²⁴ Twin Studies from Tokyo reported the incidence of TB in lung cancer patients as only 1-2% with higher frequency of squamous cell carcinoma in TB as well as lung cancer cases. These studies also refereed to higher frequency of active TB in lung cases as 5.6% than those not having it as 0.52%. This interest the Pacific and European scientist to explore active TB in lung cancer patients specifically in cases with a past TB history.^{25,26}

CONCLUSION

Tuberculosis frequency in lung cancer patients is quite high. So, we recommend that great care should be taken in these particular patients for early recognition and management of the condition which will help in reducing the morbidity and mortality of the community.

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