

## Original Research Article

# Prevalence of type and etiology of lung cancer among the patients presented to a tertiary care hospital at central Kerala: a descriptive study

Vadakkan Devassy Thomas\*, Binila Jose, Davis Kizhakkepeedika Rennis

Department of Pulmonary Medicine, Amala Institute of Medical Sciences, Amala Nagar, Thrissur, Kerala, India

**Received:** 07 February 2018

**Accepted:** 12 February 2018

**\*Correspondence:**

Dr. Vadakkan Devassy Thomas,  
E-mail: [drvdthomas@gmail.com](mailto:drvdthomas@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** Lung cancer remains the most common cause of premature mortality in men in developing countries. This study was aimed to evaluate the type and etiological factors of lung cancer in patients presented to a tertiary care hospital of central Kerala.

**Methods:** A retrospective descriptive study was conducted in patients who were diagnosed as lung cancer. The medical records of such patients were reviewed. The data such as age, gender, etiological risk factors and type of lung cancer were collected. Patients with incomplete reports or repeated tests, or histopathological findings were negative for lung cancers were excluded from the study.

**Results:** Total 228 patients were included in the study with age of  $64.71 \pm 9.75$ . The male (198) and female (30) ratio was 6.6:1, indicated the male dominance. Among the histological types, the squamous cell carcinoma was 29% (68/228) found as the most prevalent type which is followed by adenocarcinoma 26% (61/228). The right side (132/228) lobe was the major segment than the left side (91/228). Similarly, incidence in the central region (128/228) was more than the peripheral region (69/228). Among the right side, the upper lobe was dominant when compared to the lower or middle lobe. The lower left lobe incidence was found in 47/228 cases. Among the total, 188 cases were tobacco smokers while the remaining were nonsmokers.

**Conclusions:** Squamous cell carcinoma with right side upper lobe of lung was prevalent among the lung cancer cases. Tobacco smoking was found to be the major etiological factor.

**Keywords:** Bronchoscopy, Cytology, Lung cancer, Squamous cell carcinoma

### INTRODUCTION

Lung cancer has been the most common cancer in the world for several decades. There were 1.61 million new cases estimated, representing 12.7% of all new cancers in 2008 indicate that it is still the most common cancer in worldwide.<sup>1</sup> Majority of the cases now occur in the developing countries. Since, the prognosis of lung cancer is unfavorable, early diagnosis plays an important role in increasing the survival. Among the major etiological

factors, tobacco smoking remains the major one. While places like Asia and Africa other risk factors such as coal smoke and occupational exposure to carcinogens were demonstrated.<sup>2</sup>

Though the declining trends in the incidence of lung cancer was reported in some countries, it will continue to be a major cause of mortality throughout the world. It is estimated that by 2030, lung cancer will be the sixth most common cause of death, compared with its current

ranking of ninth.<sup>3</sup> According to the GLOBOCAN 2012 report, the estimated incidence of lung cancer in India was 70,275 in all ages and both sexes.<sup>1</sup> One million of the current 5 million deaths in world are contributed by India.<sup>4</sup> Despite the large number of publications on cancer incidence, the comprehensive data on lung cancer incidence in India is lacking. Furthermore, the prevalence of lung cancer and the major etiology has not yet been established in the central part of Kerala. The prevalence and pattern of lung cancer vary according to the geographic region and ethnicity.<sup>5</sup> Therefore, study on the incidence of lung cancer in population of various geographic regions is essential. Hence, this study was aimed to evaluate the prevalence of lung cancer and the major etiological factor involved.

**METHODS**

**Study design**

A retrospective descriptive study was designed to analyze the histological type and etiology of lung cancer among the lung cancer patients who presented in the Pulmonology department during the period between June, 2015 and June, 2017. The medical records of such patients were reviewed and data such as age, gender, etiology and the histology types were collected. Patients with incomplete reports or repeated tests, patients for whom cytological or histopathological findings were negative for lung cancer were excluded from the study. The study procedure was approved by the Institutional ethical committee.

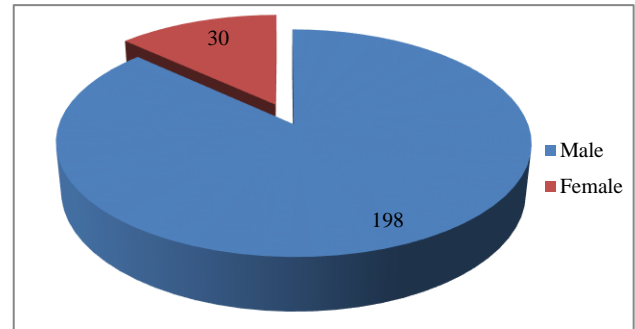
**Study procedure**

All the lung cancer patients were subjected to bronchoscopic procedures by the same specialist after the topical anesthesia using lignocaine 10% spray as well as its 4% solution. The device was inserted nasally, with the patient in the supine position. After thorough inspection of the bronchial tree, samples were taken from areas showing abnormality. During the procedure, endobronchial or transbronchial biopsy specimens were collected for diagnosis by histopathology. The findings were classified as being negative for, inconclusive for, suggestive of, or positive for malignancy. The findings that were classified as inconclusive were taken as negative, whereas those classified as being suggestive of malignancy were considered positive. The histological classification of tumors is based on the criteria used by the World Health Organization (WHO). Demographic details such as age, gender and detailed history were collected using the questionnaire. The location of cancer was also evaluated using computed tomography.

**RESULTS**

Total 228 patients were included in the study. The mean age was 64.71 and the male (198/228) to female (30/228) ratio was 6.6:1 (Figure 1). Among the types analyzed

histologically, the squamous cell carcinoma was 29% (68/228) found most prevalent which is followed by adenocarcinoma (61/228) (Table1).



**Figure 1: Distribution of gender.**

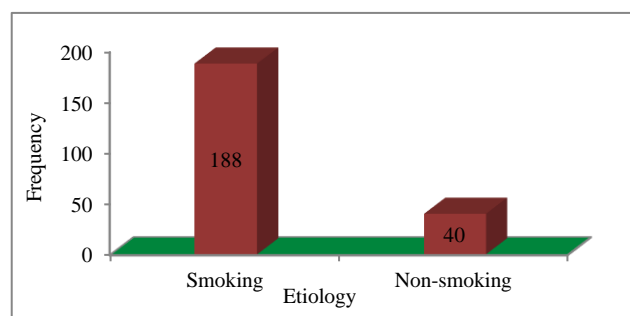
The right-side lobe (132/228) with central location (128/228) was the major segment for the incidence (Table 2). Segment wise distribution of cancer cases by radiological imaging is depicted in Table 3. The left side lobe and peripheral region were found in 91/228 cases and 69/228 cases, respectively. Among the right side, the upper lobe (68/228) was most dominant segment when compared to the lower or middle lobe segment. The incidence in the lower left lobe (46/228) was more than the upper lobe (38/228).

**Table 1: Distribution of type of cancer by histopathological analysis.**

Type	Frequency	%
Squamous cell carcinoma	68	29.8
Small cell lung cancer	59	25.9
Adenocarcinoma	61	26.8
Non-small cell lung cancer	35	15.4
Bronchioloalveolar carcinoma	5	2.1
Total	228	100

**Table 2: Region wise distribution of cancer cases.**

Region	Frequency	%
Central	159	69.7
Peripheral	65	28.5
Nil	4	1.8
Total	228	100



**Figure 2: Etiology of lung cancer.**

The etiological factors of lung cancer are depicted in Figure 2. Among the total patients, 188 had history of tobacco smoking. Most of the male patients (188/198) were smokers while none of the female patients had history of smoking.

**Table 3: Segment wise distribution of cancer cases by radiological imaging.**

Segment	Frequency	%
Right upper lobe	68	29.8
Right middle lobe	24	11.4
Right lower lobe	21	9.2
Left upper lobe	38	16.6
Left lower lobe	47	20.6
*Lb 8	21	9.2
*Lb 9	9	3.9
Total	228	100

\*Left bronchus

## DISCUSSION

The result of the study revealed that squamous cell carcinoma was the major type of cancer and the segment involved was the right upper lobe. Most of the previous Indian studies have described squamous cell carcinoma as the commonest histology.<sup>6</sup> Some of the previous studies reported that in the Western countries and most of the Asian countries adenocarcinoma has surpassed squamous cell carcinoma.<sup>7,8</sup> However, the recent studies from two major centres are showing a changing pattern in India. Singh et al, reported that adenocarcinoma has become the commonest subtype.<sup>9</sup> The time trends of lung cancer in both sexes show a significant rise in cities such as Chennai, Delhi and Bengaluru. The incidence and pattern of lung cancer differ as per geographic region and ethnicity and largely reflect the prevalence and pattern of smoking.<sup>10</sup>

The male dominance was found in this study which is consistent to the previous report. WHO while analyzing the global burden of diseases highlighted that cancer of lung as one of the leading causes of cancer-related premature mortality among males.<sup>11</sup> Tobacco smoking such as cigarettes and beedis had significant association as a principal risk factor for the causation of lung cancer in Indian men. Previous studies demonstrated that the smokers have 15- to 30-fold increased risk for developing lung cancer when compared to the nonsmokers.<sup>12-14</sup> However, no such association could establish among Indian women which indicates that there could be other risk factors besides smoking. In this study, no risk factors could indentify among the non-smokers.

Despite the use of various methods such as imaging tests (chest X-ray and CT) and sputum cytology, the fiberoptic bronchoscopy can contribute to early diagnosis.<sup>15</sup> Fiberoptic bronchoscopy is currently considered as the primary method for evaluating the tracheobronchial tree in patients with suspected lung cancer.<sup>16</sup> In addition to

allowing visualization of the lesion, this method allows the collection of cytological and histological specimens. All the patients in this study were subjected to fiberoptic bronchoscopy for the histological specimens. Further, the use appropriate immunohistochemistry can improve the histological sub-typing. Limitations of this study include the short duration which was performed at a single tertiary care centre and risk factors other than tobacco smoking could not be analyzed.

## CONCLUSION

Squamous cell carcinoma with right upper lobe of lung was prevalent among cases. Tobacco smoking was found to be the major etiological factor. Hence, awareness in the society about the deleterious effect of tobacco smoking is warranted to reduce the incidence.

## ACKNOWLEDGEMENTS

Authors would like to thank Dr. Ajith T.A, Professor, Department of Biochemistry, Amala Institute of Medical Sciences, Thrissur, Kerala, India.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

1. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN2008. *Int J Cancer.* 2010;127:2893-917.
2. Ezzati M, Henley SJ, Lopez AD, Thun MJ. Role of smoking in global and regional cancer epidemiology: current patterns and data needs. *Int J Cancer.* 2005;116:963-71.
3. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med.* 2006;3:e442.
4. Thankappan KR, Thresia CU. Tobacco use and social status in Kerala. *Indian J Med Res.* 2007;126:300-308n.
5. Malik PS, Raina V. Lung cancer: Prevalent trends and emerging concepts. *Indian J Med Res.* 2015;141:5-7.
6. Behera D, Balamugesh T. Lung cancer in India. *Indian J Chest Dis Allied Sci.* 2004;46:269-81.
7. Janssen-Heijnen ML, Coebergh JW. The changing epidemiology of lung cancer in Europe. *Lung Cancer.* 2003;41:245-58.
8. Increasing incidence of adenocarcinoma of the lung. Valaitis J, Warren S, Gamble D. *Cancer.* 1981;47:1042-6.
9. Singh N, Aggarwal AN, Gupta D, Behera D, Jindal SK. Unchanging clinico-epidemiological profile of lung cancer in north India over three decades. *Cancer Epidemiol.* 2010;34:101-4.

10. Malik PS, Sharma MC, Mohanti BK, Shukla NK, Deo S, Mohan A, et al. *Asian Pac J Cancer Prev.* 2013;14:489-94.
11. World Health Organization. Global burden of disease 2002 estimates (revised). <http://www.who.int/healthinfo/bodestimates/en/index.html>. Accessed January 23, 2008.
12. Noronha V, Pinninti R, Patil VM, Joshi A, Prabhaskar K Lung cancer in the Indian subcontinent. *South Asian J Cancer.* 2016;5:95-103.
13. Alberg AJ, Samet JM. Epidemiology of lung cancer. *Chest.* 2003;123:21S-49S.
14. Sasco AJ, Secretan MB, Straif K. Tobacco smoking and cancer: a brief review of recent epidemiological evidence. *Lung Cancer.* 2004;45:S3-S9.
15. Hausmann HJ. Smoking and lung cancer: future research directions. *Int J Toxicol.* 2007; 26: 353-364.
16. Fernandez A, Jatene FB, Zamboni M. Diagnosis and staging of lung cancer. *J Pneumol.* 2002;28:219-28.

**Cite this article as:** Thomas VD, Jose B, Rennis DK. Prevalence of type and etiology of lung cancer among the patients presented to a tertiary care hospital at central Kerala: a descriptive study. *Int J Res Med Sci* 2018;6:834-7.