



## Distribution of Lung Cancer in Chennai Population

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### ABSTRACT

The aim of this research is to understand the distribution of lung cancer in Chennai population. The objective of this study is to analyse the epidemiological variations with relation to lung cancer in the Chennai population. Lung cancer is the most commonly occurring cancer. It accounts for 19% of cancer related deaths worldwide. In India, lung cancer constitutes 6.9% of all new cancer cases with Chennai being the third city with most number of lung cancer cases. It is caused mainly due to smoking. The other causes include the inhalation of asbestos fibres, radon gas, air pollution and familial disposition. The high mortality rate associated with lung cancer indicates the lack of awareness of this disease in the society. Hence epidemiological studies are needed to understand the variations and the occurrence of lung cancer.

**Keywords:** lung, cancer, Mortality, disease, society.

### INTRODUCTION

Lung cancer is the malignant tumour in the tissue of the lungs due to the uncontrolled growth of cells in the respiratory epithelium<sup>1</sup>. Lung cancer is the second most commonly occurring cancer in the world among both males and females and there are about 1.61 million new cases of lung cancer worldwide<sup>2</sup>. In India lung cancer has an occurrence of 6.9% of all the other cancers and accounts for 9.3% of all cancer related deaths<sup>3</sup>. There are two types of lung cancer- small cell lung cancer and non-small cell lung cancer. Small cell lung cancer is due to the malignancies arising from cells exhibiting neuroendocrine Characteristics. They are also called paraneoplastic syndromes and grow in a rapid and aggressive manner. It accounts for 15% of the lung cancer<sup>4</sup>. They have two stages: extensive and limited. Non-small cell lung cancer accounts for 85% of the lung cancers and has three pathological subtypes- Adenocarcinoma, Squamous cell carcinoma and large cell carcinoma. Adenocarcinoma occurs in the cells secreting mucous. It occurs in the outer part of the lungs<sup>5</sup>. It arises peripherally and has an occurrence of 38.5%<sup>4, 5</sup>. Squamous cell carcinoma arises in the squamous cells lining the respiratory epithelium. It occurs in the central part of the lungs and is linked to a history of smoking<sup>6</sup> It has an occurrence of about 20%. Large cell arises in any part of the lungs and spreads quickly. It has an occurrence of about 2.8%<sup>7, 8</sup>. Non small cell lung cancer can be divided in to may stages base on an internationally accepted TNM (tumour, node, and metastasis) system into 4 stages. The other types of lung cancers are lung carcinoid tumours, cystic carcinomas, lymphoma, sarcoma and hamartoma<sup>5</sup>.

The most important cause of lung cancer is cigarette smoking<sup>9</sup>. Other causes include passive smoking, radon

gas, inhalation of polluted air and occupational diseases involving arsenic, asbestos, silica, bismuth, beryllium etc. Genetic factors also play an important role in the development of lung cancer that is the people with genes susceptible to lung cancer have an increased chance of being affected by the disease on smoking. The most important symptom indicating lung cancer is the change in chronic cough occurring in 65-75% of the patients with lung cancer. The other symptoms include hemoptysis, chest pain, wheezing, weight loss, anorexia, fatigue, bone pain, hoarseness etc.<sup>10</sup> The diagnosis of lung cancer includes initial clinical evaluation with patients medical history and physical examination. To confirm the presence of lesion chest x- rays, CT scan, bronchoscopy, trans thoracic needle aspiration. For non small cell lung cancer diagnosis is by cytology or surgical biopsy<sup>11</sup>. The treatment option for lung cancer depends on the type, extent and the stage of the lung cancer. The treatment options available are surgery, radiation, chemotherapy, immunotherapy and targeted therapy. Surgery after chemotherapy is called adjuvant therapy and chemotherapy before surgery is called neoadjuvant therapy. This article is about a study of the distribution of lung cancer patients in chennai population.

### MATERIALS AND METHODS

The lung cancer reports of 33 patients from cancer institutes in Chennai were collected and information such as the patient's name, age, sex, type of lung cancer, the side of affected lung and treatment provided was noted. The data was compiled to get the percentage distribution and graphs were drawn for the individual data.



## DISCUSSION

The aim of this study is to find out the distribution of lung cancer patients in Chennai population. The statistical data can help in the effective prediction of the future trends of lung cancer in Chennai which will help in improving the various treatment options and facilities available for lung cancer patients. A total of 33 patients diagnosed with lung cancer were analyzed. In this study it was found that males accounted for 64% of the lung cancer population and females accounted for 36%. In this study, lung cancer occurs to be most commonly affecting the males when compared to the females (Graph:-2). Based on data collected between 1982-1994 by the National committee of Cancer Research, it was found that lung cancer to have the second highest prevalence among men.<sup>12</sup> In a study conducted by R. Swaminathan et.al, V. ShantaJ et.al, Ferlay, S. Subramaniam et.al, F. Bray et.al, R. Sankaranarayan et.al. The percentage occurrences of lung cancer for males and females have been compared between 1982-1986 and 2002-2006. Between the years 1982-1986 lung cancer was found to be the second most commonly occurring cancer among men with a percentage of 8.3% whereas between 2002-2006 lung cancer among men had the highest occurrence when compared to other cancers occurring in about 10.3% of the population.<sup>13</sup> In a study conducted by R. Vishwanathan, Sen Gupta, P.V. Krishna Iyer 87.3 % of lung cancer patients were males and 12.7% were females<sup>14</sup>. Hence it is found to occur more in the males when compared to the females however current time trends have shown a significant rise in the occurrence of lung cancer in both males and females of Chennai, Delhi and Bombay<sup>2</sup>.

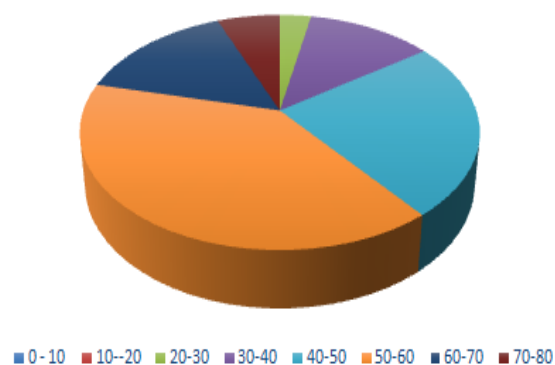
It was found that there were no lung cancer patients between the age groups 0-20 years of age. 3 % of the people between 20-30 years, 12 %of the people between ages 30-40 years, 24 % of people between 40-50 years, 39 %of people between 50-60 years, 15 % of people between 60-70 years and 6 %between 70-80 years were found to be affected by lung cancer in chennai population(Graph:-1). Hence majority of the lung cancer patients are between the age group of 50 to 60 years. It has a least prevalence between 20 to 30 years and also below that age group, as there is 0% prevalence between age groups 0-20. This is similar to study conducted by Siegel and colleagues in which there were no lung cancer patients below the age of 20 years and it was found that 2% of lung cancers was diagnosed in patients between age 20 and 34 years; 1.5% between 35 and 44 years; 8.8% between 45 and 54 years; 20.9% between 55 and 64 years; 31.1% between 65 and 74 years; 29% between 75 and 84 years; and 8.3% at 85 years and older studies<sup>7,4</sup>. In a study conducted by R. Vishwanathan, Sen Gupta, P.V. Krishna Iyer the largest number of lung cancer cases were found to be 46% between the age groups 50-60 years.<sup>14</sup>

In this study it was observed that 64% of the lung cancer patients had a tumor affecting the right lung where as the remaining 36% of the people were affected due to tumour in the left lung (Graph:-3). Hence lung cancer is most commonly found affecting the right lung when compared to that of the left lung.

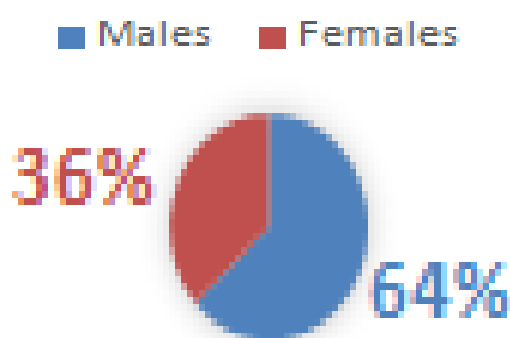
The most common type of lung cancer in this study was found to be non-small cell type cancer with a distribution of 88% when compared to small cell type cancer with a percentage distribution of 12%(Graph:-4). The results obtained in this study is in concurrence with the study conducted by D Behera in which 75-80% of the patients were affected by non-small cell type lung cancer and 20 % of the patients were affected by small cell lung cancer.<sup>15</sup> In a study conducted by V Noronha, R Dikshit, N Raut, A Joshi, CS Pramesh, K George, JP Agarwal, A Munshi, K Prabhash on lung cancer patients, 92% of the population had non-small cell lung cancer where as only 8 % were affected by small cell type cancer.<sup>16</sup>

In this study, among the various types of non-small cell type lung cancer, the most prevalent type was found to be adenocarcinoma (Graph:-5). Adenocarcinoma was found in 67% of the lung cancer patients having non-small cell type lung cancer. The second common type was found to be squamous cell carcinoma with a percentage distribution of about 27%. The least common type was found to be large cell carcinoma.

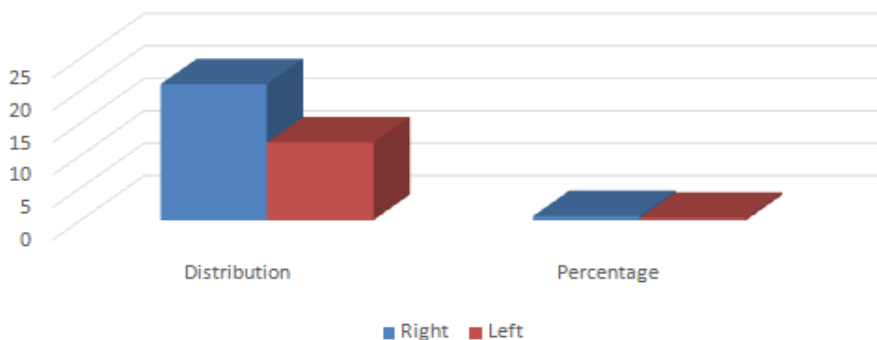
Graph 1- lung cancer among different age groups



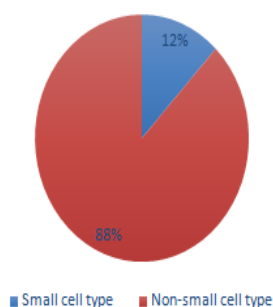
GRAPH:2 DISTRIBUTION ON LUNG CANCER AMONG MALES AND FEMALES



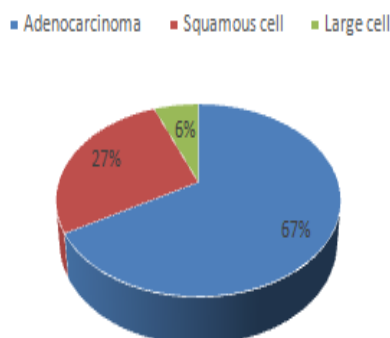
Graph:3 lung cancer incidence in right or left lung



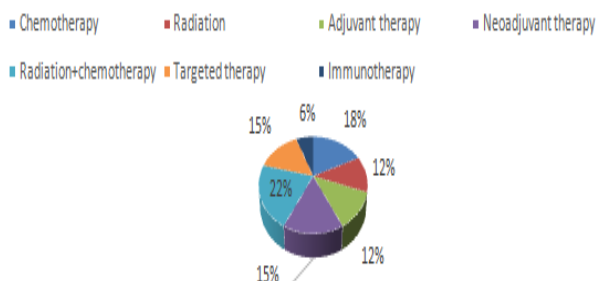
Graph 4: distribution of types of lung cancer types



Graph 5: distribution of types of non-small cell type



Graph 6- treatment options for lung cancer



It was found in only about 6% of the patients. Similarly in a study conducted by V Noronha, R Dikshit, N Raut, A Joshi, CS Pramesh, K George, JP Agarwal, A Munshi, K Prabhaskar adenocarcinoma had the highest occurrence followed by squamous cell carcinoma with large cell carcinoma having the lowest occurrence. 43 % patients had adenocarcinoma, 26.2% had squamous cell carcinoma and 2% had large cell carcinoma.<sup>16</sup>

It was found in this study that 18% of the lung cancer patients are under chemotherapy as a treatment option. It was found that 12% the patients are under radiation therapy, 12% of the patients are under adjuvant therapy, 15% of the patients are under neoadjuvant therapy, 21% of the patients are undergoing treatment involving a combination of both chemotherapy and radiation, 15% of the patients are undergoing targeted therapy and 6% of the people are under immunotherapy(Graph:-6). However in a study conducted by V Noronha, R Dikshit, N Raut, A Joshi, CS Pramesh, K George, JP Agarwal, A Munshi, K Prabhaskar it was found that 13% of the patients underwent chemotherapy and radiotherapy and 6% of the patients underwent surgery.<sup>16</sup>

**CONCLUSION**

Hence in this study it was found that males are more affected by lung cancer when compared to females between the age groups 50 to 60 years and showing least occurrence below 20 years of age. Non- Small cell lung cancer was the most commonly occurring cancer under which adenocarcinoma had the highest occurrence and large cell carcinoma, the least occurrence. It was found that right side of the lung was more affected by cancer when compared to the left. A combination of radiation and chemotherapy was found to be the most commonly used treatment with immunotherapy the least commonly used treatment owing to its high cost. Hence this study aims at finding out the distribution of lung cancer patients for the improvement of facilities and to implement effective treatment measures to control this disease and hence help to reduce the mortality rate in the society associated with this disease.

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