Original Article

# Correlation of Smoking to various Histological types of Bronchogenic Carcinoma

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**ABSTRACT**

**Aim:** To assess the relationship of histological type of bronchogenic carcinoma to smoking.

**Materials and Methods:** This study was a prospective analysis of patients attending outpatient department of pulmonary medicine in Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar.

**Results:** Out of 29 patients, who had adenocarcinoma, 26 were smokers and 3 were non smokers. Among 12 patients who had squamous cell carcinoma, 11 were smokers and one patient was a non smoker. The 4 patients found to have small cell carcinoma were smokers.

**Conclusion:** The incidence of bronchogenic carcinoma is more common in males compared to females, partly attributed to the low incidence of smoking in south Indian people. All pathological types of bronchogenic carcinoma were associated with smoking. Bidi smoking is the commonest pattern of smoking habit found which is associated with slightly higher risk of bronchogenic carcinoma when compared to cigarettes. Adenocarcinoma is the most frequent histological type followed by squamous cell carcinoma.

**Keywords:** Bronchogenic carcinoma, chest x-ray, CT chest, biopsy

## INTRODUCTION

Lung cancer is a major health problem worldwide. The incidence is increasing globally at a rate of 0.5% per year. The worldwide incidence is 14%. In India, lung cancer constitutes 6.9 per cent of all new cancer cases and 9.3 per cent of all cancer related deaths in both sexes, it is the commonest cancer and cause of cancer related mortality in men, with the highest reported incidences from Mizoram in both males and females (Age adjusted rate 28.3 and 28.7 per 100,000 population in males and females, respectively).

Unlike many other malignancies, whose causes are largely unknown, the cause of lung cancer is tobacco smoking in as many as 90% of patients. Although the relationship between cigarette smoking and squamous cell carcinoma and small cell carcinoma has long been clear, the relationship between smoking and adenocarcinoma, large cell carcinoma has been more ambiguous. While the older literature suggest that smoking is unrelated to adenocarcinoma more recent data indicates that all the major histopathological types are related to smoking.

Adenocarcinoma is the most frequent Non Small Cell Cancer in india followed by squamous cell carcinoma. Although there are a plenty of studies relating smoking to Bronchogenic Carcinoma, there is a paucity of studies relating smoking to histopathological type. This study will focus on relationship of smoking to histological type of bronchogenic carcinoma.

## MATERIALS AND METHODS

A Hospital based analytical study was carried out in Department of Pulmonoary Medicine, Chalmeda AnandRao Institute of Medical Sciences, Karimnagar over a period of 2 years from October 2015 to October 2017.

In the study period of 24 months among patients attending Pulmonary Medicine out patient Department, 45 patients were selected. Permission to conduct the study

was obtained from Institutional Ethics committee (IEC), CAIMS, Karimnagar. Informed oral consent was obtained from all patients.

*Inclusion criteria:*

Patients who had histological or cytological confirmation of lung cancer determined through fiberoptic bronchoscopy, USG/ CT guided FNAC/biopsy will be selected. Detailed history, clinical Examination, Basic Biochemical Investigations were done in all patients.

*Exclusion criteria:*

Patients with secondary lung cancer

lymphoproliferative disease

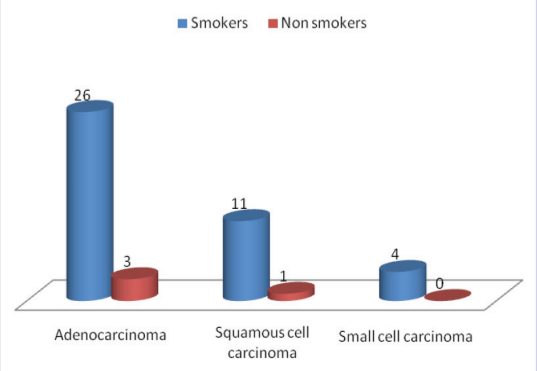
Malignant pleural effusion of unknown primary or non pulmonary site

sarcoid tumors and other rare varieties were excluded from the study.

## RESULTS

**Table 1 : Correlation of type of Bronchogenic carcinoma with smoking**

| Pathological type of tumor | Smokers | Non smokers |
|---|---|---|
| Adenocarcinoma | 26 | 3 |
| Squamous cell carcinoma | 11 | 1 |
| Small cell carcinoma | 4 | 0 |




**Graph 1**

Out of 29 patients who had adenocarcinoma, 26 were smokers and 3 were non smokers. Among 12 patients who had squamous cell carcinoma 11 were smokers and one patient was a non smoker. The 4 patients found to have small cell carcinoma were smokers. Among the 4 patients who were non smokers, 3 had adenocarcinoma and 1 had squamous cell carcinoma.

**Table 2: Sex Incidence**

| Sex | No of patients |
|---|---|
| Male | 41 |
| Female | 4 |
| Total | 45 |

Table shows that out of 45 patients 41(91%) were male and 4(9%) were female. The male to female ratio is 14:1.

**Table 3: Age Incidence of Bronchogenic carcinoma**

| Age | Male | Female |
|---|---|---|
| 41 to 50 | 3 | 1 |
| 51 to 60 | 23 | 3 |
| 61 to 70 | 15 | 0 |

From the above table it is found that 26 patients were within the age group 51 to 60 years which constitutes 57% of the patients studied. Only 4 patients were below 50 years and the rest 41 patients (91%) were above 50 years. The mean age of incidence as per study is 59 years both in males and females.

**TABLE 4: Showing Different Smoking Patterns**

| Smoking patterns | No of Patients |
|---|---|
| Bidi | 25 |
| Cigarette | 10 |
| Bidi and cigarette | 5 |
| Tobacoo chewing | 1 |
| Total | 41 |

Among 41 patients who are smokers, 25 patients smoked bidi, 10 patients cigarette, 5 patients both bidi and cigarette and one patient had the habit of tobacco chewing.

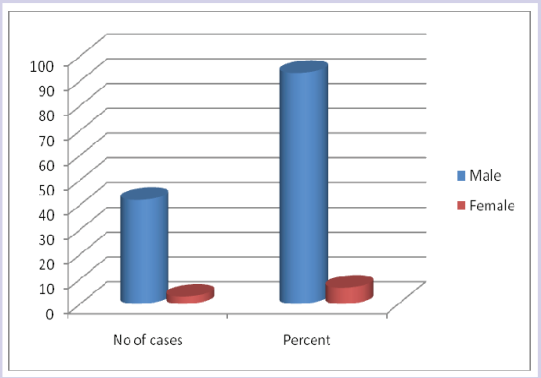
## DISCUSSION

Of the three major lung cancer subtypes, the excess risk for heavy smokers compared with never smokers was higher for adenocarcinoma than for squamous cell and small cell carcinomas. Adenocarcinoma of the lung is more strongly associated with tobacco smoke exposure than previously recognized.[1]

Tobacco smoking is the most important modifiable risk factor for lung cancer. It has been estimated that 20% of all cancer deaths worldwide could be prevented by the elimination of tobacco smoking .[2]

More than 80% of lung cancers develop in smokers, and one in nine smokers develop lung cancer.[3] The cumulative lung cancer risk among lifelong heavy smokers can be as high as 30% compared with a lifetime risk of less than 1% in nonsmokers. [4, 5]

Smoking cessation, especially at younger age, is associated with many health benefits including lowering the risk of lung cancer; cessation before the age of 40 years reduces the risk associated with continued smoking by 90% .[6] Lung cancer risk is proportional to the magnitude of cigarette consumption, as factors such as the number of packs per day smoking, the age of onset of smoking, the degree of inhalation, the tar and the nicotine content of cigarettes, and use of unfiltered cigarettes are important.[7, 8] Individual susceptibility, which is a function of environmental factors and genetic predisposition, is a factor in carcinogenesis.



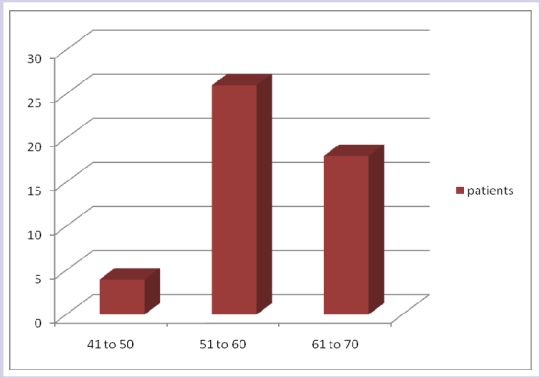

**Graph: 2 Sex Incidence**

The male to female ratio in our study is 14: 1.

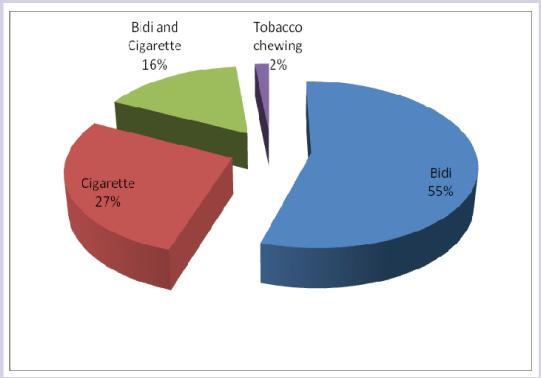
In a study conducted in northern India in Chandigarh in 2005 [9], the overall male to female ratio is 5.2: 1, which is much low when compared to our study. In a study conducted in Pakistan in the year 2002[10] the male to female ratio is 6: 1. In western countries the sex ratio is in the range of 3 to 4: 1.

The recent increase in incidence among women in the West, which has been associated with a great increase in their smoking, may now give rise to the fall in sex ratio which Ochsner and De Bakey anticipated .[11] The low incidence in south Indians is attributed to less incidence of smoking in women.

The average age incidence in our study is 59 years, which is similar to the study conducted in Chandigarh in 2005. [9] In the study done in western Nepal [12] in 2001 the median age of the male and female patients was 67 and 66 years respectively. Increased smoking, urbanisation, and the introduction of new industries has probably led to a rise in the incidence of bronchogenic carcinoma in India at an earlier age.




**Graph 3: Age Incidence of Bronchogenic Carcinoma**




**Graph 4: Prevalence of Different Smoking Patterns**

The most common pattern of smoking in our study is bidi (55%). Twenty seven percent had the habit of smoking cigarette. 16% had the habit of smoking both bidi and cigarette. One female had the habit of tobacco chewing.

In the study conducted in Northern India[9], bidi smoking is the major pattern in Chandigarh patients affected by bronchogenic carcinoma. Bidi and cigarette scored the second place followed by cigarette alone as in our study.

In India the smoking of manufactured cigarettes is less common than in Western countries. Not only do bidis contain less tobacco than the common types of Indian cigarettes but the tobacco is dried naturally and in this respect resembles cigar and pipe tobacco. Bidi smokers generally inhale deeply and Jindal and Malik [13] showed that as great a rise in carboxyhaemoglobin concentration may occur after smoking a bidi as after a cigarette. Possibly therefore the lower risk of carcinoma associated

with pipes and cigars is due not to their containing naturally cured tobacco (as opposed to the flue-cured tobacco of cigarettes) but rather to the fact that pipe and cigar smokers generally do not inhale. Hence bidi smokers generally inhale deeply and have a greater risk of developing bronchogenic carcinoma when compared to cigarette smokers.

## CONCLUSION

The incidence of bronchogenic carcinoma is more common in males compared to females, partly attributed to the low incidence of smoking in females. Highest age incidence was seen in fifth decade of life which is early when compared to other studies is due to Increased smoking, urbanisation, and the introduction of new industries. Cigarette smoking was strongly associated with bronchogenic carcinoma. Adenocarcinoma was the most frequent histological type followed by Squamous cell carcinoma. The most common lobe involvement is upper lobe and the most common side involved is right side.

## CONFLICT OF INTEREST :

The authors declared no conflict of interest.

**FUNDING :** None

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