Spectrum of Lung Cancer In Kashmiri Population: Two Year Study In A Tertiary Care Hospital

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Abstract

Background: Lung cancer is considered as one the leading causes of cancer related mortality in both men and women worldwide. Majority of the cases result from smoking. This study was done to determine the clinical and pathological pattern of lung cancer in the population of Kashmir.

Material and methods: Total number of 115 cases were collected and incorporated in the study. Before taking up of cases careful clinical and radiological findings were also taken into consideration. The tissue samples were Formalin-fixed paraffin-embedded (FFPE) followed by routine Hematoxylin and Eosin (H & E) staining. The tumours were categorised based on WHO Classification.

Results: Majority of the cases 96.52% (111) were above the age of 40 years while 3.48% (04) were below the age of 40 years with the mean age being 59 years. The disease was found to be 4 times more common among men, males comprised 74.78% (86) while female comprised 25.21% (29), male to female ratio was 3.9 : 1. Out of total number of patients 88.69% (102) were smokers while 11.31% (13) were non-smokers. The most common presenting symptom was cough which was reported in 84.34% (97) cases. The most common histological type reported was squamous cell carcinoma present in 46.96% (54) cases.

Conclusion: Complete and in depth understanding of epidemiology of lung cancer can provide basis for disease prevention and majority of the deaths are attributable to cigarette smoking, curbing the rate of smoking remains imperative.

Keywords: NIL

Introduction

Tumours which originate from the lung parenchyma or within the bronchi are referred to as Lung cancer or bronchogenic carcinoma. Lung cancer is one the leading cause of cancer related mortality in men and women worldwide. The most common cause for this type of malignancy is smoking. It is estimated that 90% of lung cancer cases are attributable to smoking (1). Other carcinogenic influences such as radon gas, air pollution, work in uranium mines, work with asbestos, and inhalation of dusts containing arsenic, chromium, nickel, or vinyl chloride, chronic infections and multiple inherited and acquired mechanisms of susceptibility to lung cancer also contribute to lung carcinogenesis. It is estimated that total number of new cases of lung cancer both sexes, all ages for the year 2020 was 2,206,771 or 11.4 % of all the malignancies reported in the world and the total number of deaths in 2020, both sexes, all ages was 1,796,144 which is 18% of all cancer related deaths worldwide (2).
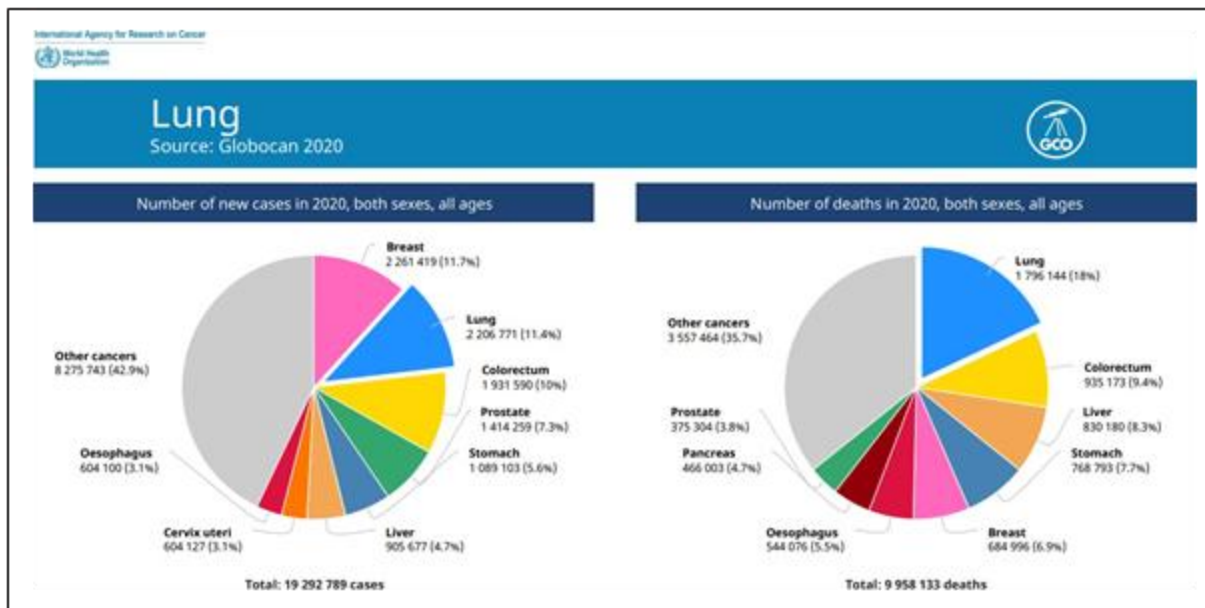
Approximately 10%–15% of cases of lung carcinoma occur in never-smokers. Among them, three- fourths are women (3) The male to female ratio is 1:1 (4). Prognosis remains dismal: 5-year survival rate for all stages of lung cancer combined is about 16%, a figure that has not changed much over the last 35 years; even with disease localized to the lung, 5-year survival rate is only 45% (5).

Histologic Classification of Malignant Epithelial Lung Tumors (WHO Classification, Simplified Version)

1. Adenocarcinoma : Acinar, papillary, micropapillary, solid, lepidic predominant, mucinous subtypes.
2. Squamous cell carcinoma.
3. Large cell carcinoma.
4. Neuroendocrine carcinoma: Small cell carcinoma, Large cell neuroendocrine carcinoma, Carcinoid tumor.
5. Mixed carcinomas : Adenosquamous carcinoma, Combined small cell carcinoma.
6. Other unusual morphologic variants : Sarcomatoid carcinoma, Spindle cell carcinoma, Giant cell carcinoma.(6)

Most common symptoms, in decreasing order of frequency, are cough, weight loss, pain, increased sputum production, haemoptysis, malaise, fever, and those resulting from paraneoplastic manifestations. Most lung cancers are in a relatively advanced stage by the time of diagnosis; about 60% are inoperable as a result of extensive locoregional spread and/or distant metastases (7). Various treatment options which are available for lung cancer include surgery, radiation therapy, chemotherapy, and targeted therapy.

Material and Methods

This was a observational study conducted in the department of Pathology, government medical college Srinagar, Kashmir which is a tertiary care referral hospital From January 2020 to December 2021. Total number of 115 cases were collected and incorporated in the study. Before taking up of cases careful clinical and radiological findings were also taken into consideration. The tissue samples were Formalin-fixed paraffin-embedded (FFPE) followed by routine Hematoxylin and Eosin (H & E) staining. Sections were thoroughly studied with proper clinico radiological backup. The tumours were categorised based on WHO Classification.

Results

In our study we found that the disease was more common in individuals with age above 40 years. Majority of the cases 96.52% (111) were above the age of 40 years while 3.48% (04) were below the age of 40 years with the mean age being 59 years. The Youngest patient was 22 years old and the oldest being 80 years old. Majority of the patients were male 74.78% (86) while female comprised 25.21% (29), male to female ratio was 3.9 : 1 the disease being 4 times more common among men. Out of total number of patients 88.69% (102) were smokers while 11.31% (13) were non-smokers. The most common

presenting symptom was cough which was reported in 84.34% (97) cases, followed by weight loss reported in 70.43% (81) cases other symptoms included haemoptysis 53.04% (61), malaise and increased sputum production. The most common paraneoplastic syndrome reported was hypercalcemia which was observed in 6.08% (7) cases and showed strong association with squamous cell carcinoma 71.42% (5) while 28.57% (2) cases were observed in patients having small cell carcinoma.
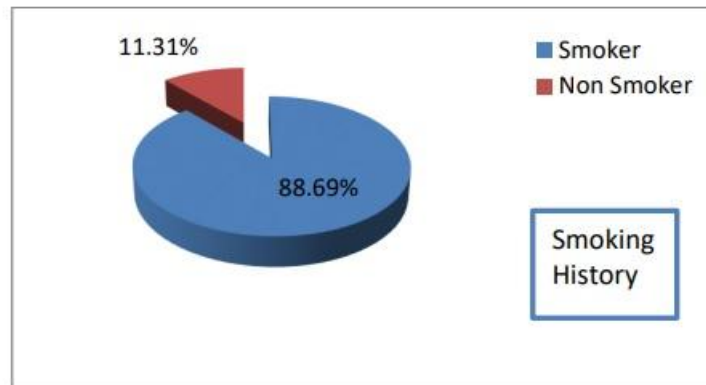
Sex Distribution

Male	Female
74.78% (86)	25.21% (29)
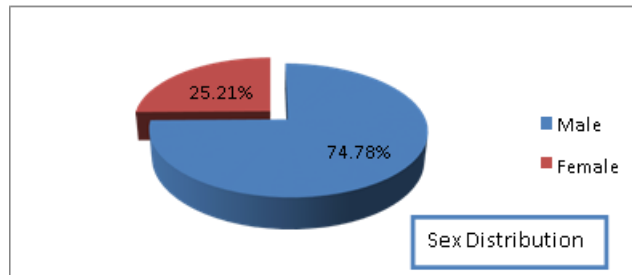
Smoking History

Smoker	Non Smoker
88.69% (102)	11.31% (13)

The most common histological type reported was squamous cell carcinoma (Figure 1) present in 46.96% (54) cases followed by adenocarcinoma (Figure 2) which was reported in 22.60% (26) cases, small cell carcinoma (Figure 3) was observed in 20% (23) cases while 10.43% (12) cases comprised of tumours such as Neuroendocrine tumor, Sarcomatoid carcinoma and Non-Hodgkin's lymphoma etc.

Histological Type

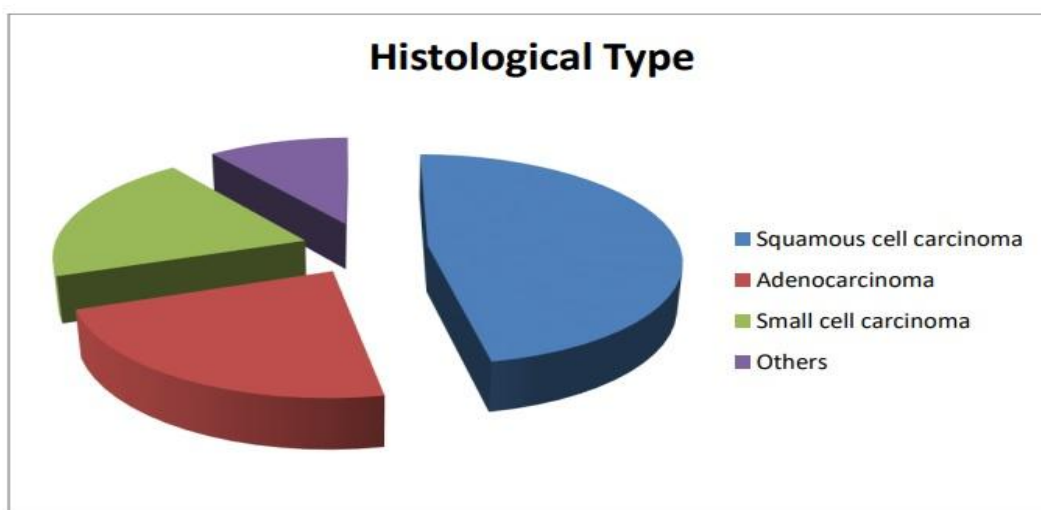| Histological Type	Percentage
Squamous cell carcinoma	46.96% (54)
Adenocarcinoma	22.60% (26)
Small cell carcinoma	20% (23)
Others (Neuroendocrine tumor, Sarcomatoid carcinoma and Non-Hodgkin's lymphoma)	10.43% (12)

Figure 1 : Squamous cell carcinoma showing sheets and islands of large polygonal malignant cells with intercellular bridging.
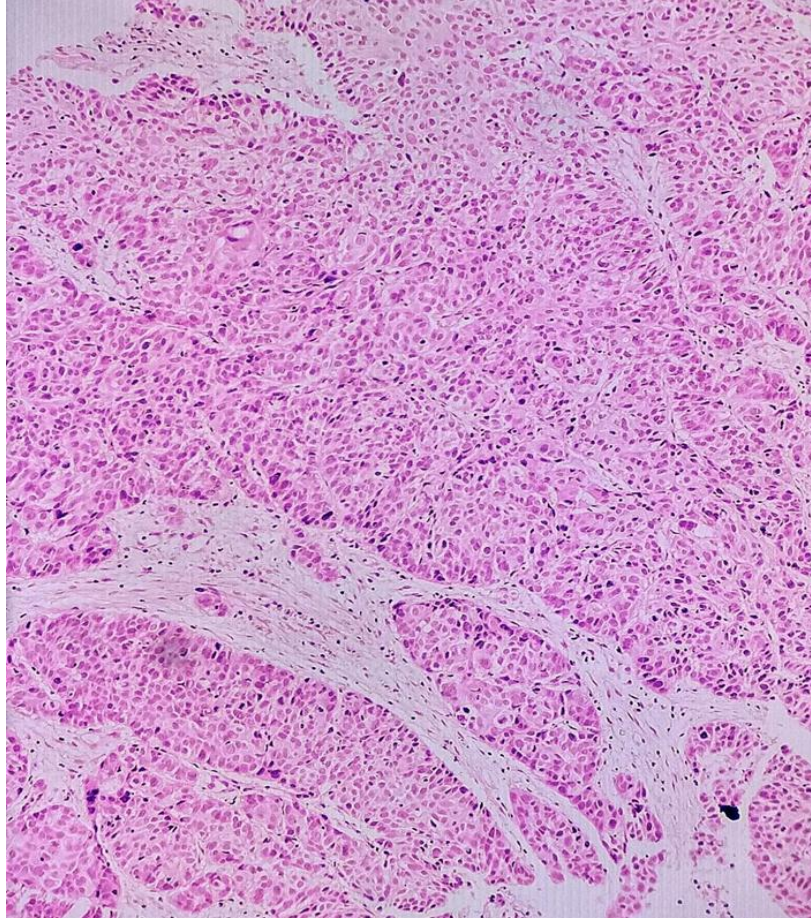
Figure 2 : Adenocarcinoma showing Acinar pattern (gland forming) with round / oval glands invading the stroma (usually fibrous)
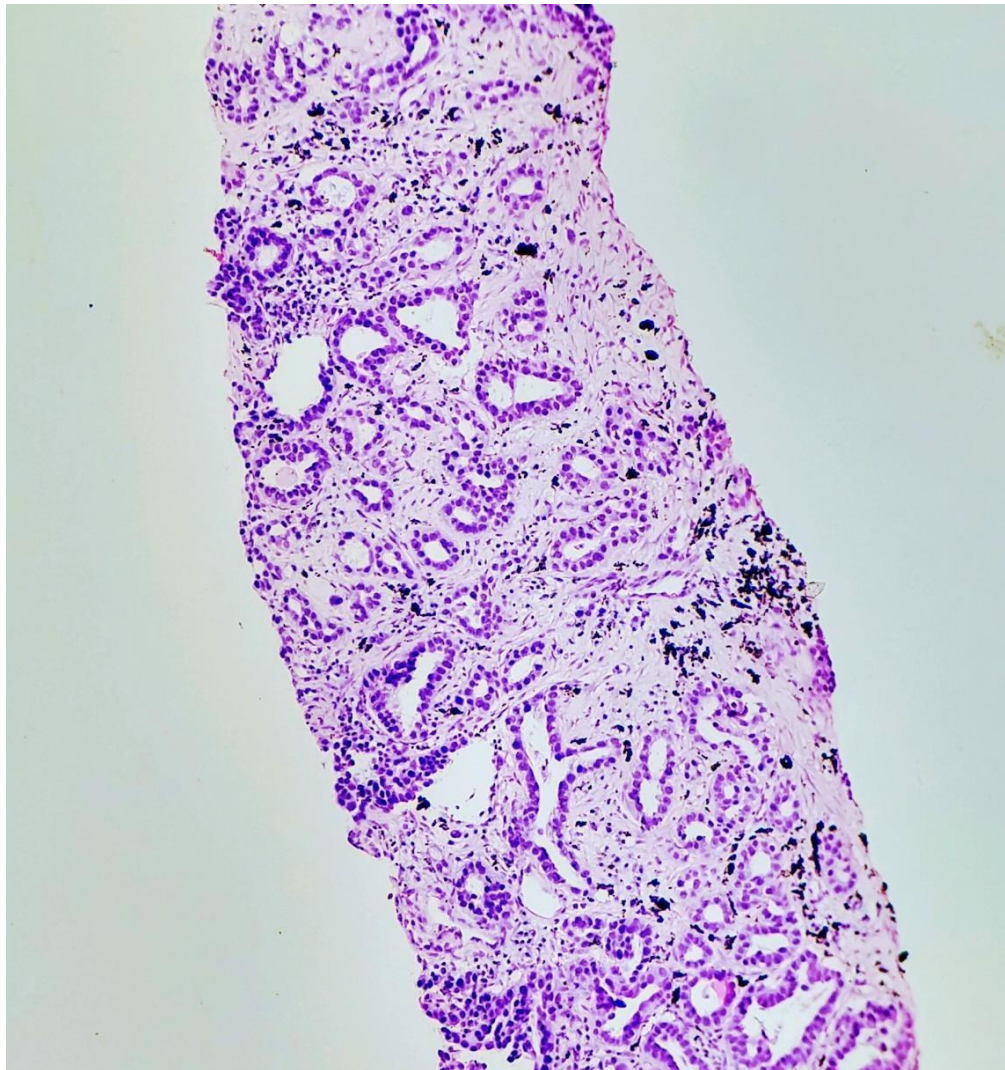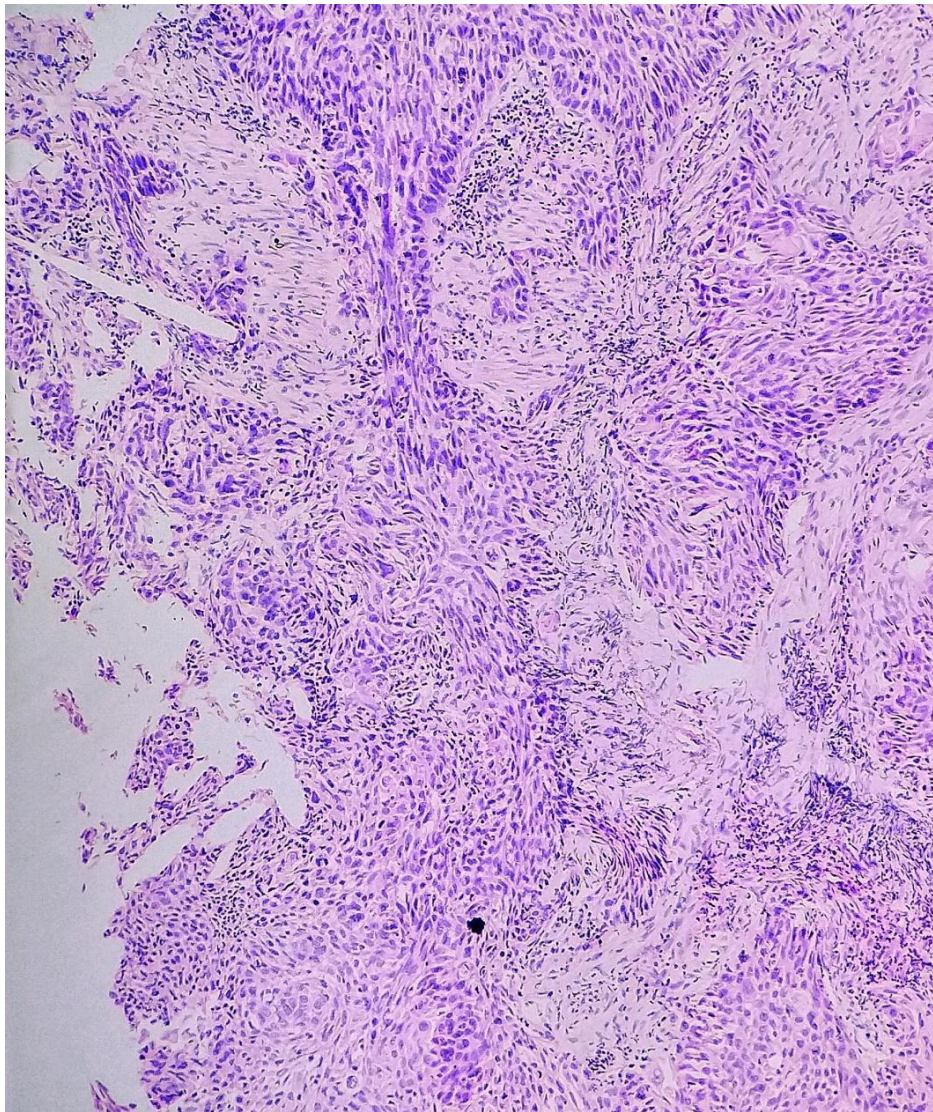
Figure 3 : Small cell carcinoma showing round / oval blue cells with minimal cytoplasm; usually small to medium sized.

Summary

Lung cancer is a highly invasive, rapidly metastasizing, prevalent cancer and is considered to be one of the top killer cancer in both men and women worldwide. The aim of this study was to report the age/gender distribution , clinical features , association with smoking and histopathological types of lung cancer in the population of Kashmir.

Lung cancer symptoms occur due to local effects of the tumour, such as cough which results due to bronchial compression by the tumour, bleeding in the airway which causes coughing up blood (hemoptysis), stroke-like symptoms secondary to brain metastasis, paraneoplastic syndromes due to elaboration of hormones indigenous to the tissue of origin of the tumour. In our study we found that the most common presenting symptom for lung cancer was cough followed by weight loss and haemoptysis.

Understanding the epidemiology of lung cancer can provide foundation for disease prevention.

Tobacco has been part of the cultural and economic structure of mankind since ancient times. In 2008, the World Health Organization named tobacco use as the world's single greatest preventable cause of death (8). Tobacco is consumed in many forms and through a number of different methods the most common of which is smoking in form of cigarettes, cigars, pipes and beedis. An estimated

1.1 billion people, and up to one-third of the adult population, use tobacco in some form (9). In India, tobacco generates approximately 20 billion Indian

Rupees (US$0.45 billion) of income per annum as a result of employment, income and government revenue. The magnitude of the effect of cigarette smoking far outweighs all other factors leading to lung cancer. The risk for lung cancer increased with the duration of smoking and the number of cigarettes smoked per day. It is estimated that the average male smoker has an approximately 9-fold to 10-fold risk for lung cancer, whereas heavy smokers have at least a 20-fold risk (11). In our study we found a strong association of smoking with lung cancer Out of total number of patients 88.69% (102) were smokers while 11.31% (13) were non-smokers.

Lung cancer showed a strong association with gender and age progression. In our study we found that It is 4 times more common in males as compared to females in Kashmiri society and risk of developing cancer increases with age. The mean age of presentation for which is 59 years.

Lung cancer evaluation can be done by employing Clinical signs and symptoms

Radiological staging

1. Chest X ray
2. CT Scan
3. PET scan etc Invasive procedures
4. Bronchoscopic endobronchial ultrasound-transbronchial needle aspiration (TBNA)
5. Endoscopic-TBNA
6. Mediastinoscopy
7. Thoracoscopy or video-assisted thoracoscopy (VATS)

The final diagnosis requires confirmation of aspirated material by microscopic examination using routine Hematoxylin and Eosin (H & E) staining. Special techniques such as immunohistochemistry and genetic studies can also be performed in difficult cases and to exclude primary lung cancer from possible metastasis. The most common histological type reported in our study was squamous cell carcinoma (Figure 1) which was seen in 46.96% of the cases. The future challenge will be to reduce the impact of identified external sources of risk while at the same time expanding our knowledge of the genetic and molecular basis of carcinogenesis. Early diagnosis of lung cancer will always remain imperative because the 5-year survival even for disease limited to lung is 45%.

Surgery remains the mainstay of treatment with the procedure of choice being either lobectomy or pneumonectomy with mediastinal lymph node sampling. For advanced disease surgery followed by adjuvant chemotherapy is used while Stage IV disease is still considered to be incurable, and the sole aim of therapy is improving survival and alleviating symptoms. Cancer immunotherapy is the latest modality of treatment which causes stimulation of the immune system to treat cancer, improving on the immune system's natural ability to fight the disease.

Conclusion

Our study provides insight into the incidence, age of presentation, gender distribution, symptoms and histological patterns of lung malignancy in the population of Kashmir. We conclude that a thorough understanding of epidemiology of lung cancer can provide basis for disease prevention and majority of the deaths are attributable to cigarette smoking, curbing the rate of smoking remains imperative. The various treatment options for lung cancer include surgery, radiation therapy, chemotherapy, and targeted therapy all of which are most effective when applied at the earliest stage with stage IV stages being incurable.

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