

Histopathological Profile of Lung Cancer: A Single-Center Study from Nepal

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ABSTRACT

Introduction

Lung cancer remains the leading cause of cancer-related mortality globally, accounting for approximately 18% of all cancer death. Despite the global prevalence of lung cancer, epidemiological data from Nepal remain limited. The study aims to bridge these gaps by investigating the histopathological characteristics of lung cancer in a cohort of patients from a tertiary care center in Nepal.

Methods

This is an observational cross-sectional study conducted at Tribhuvan University Teaching Hospital (TUTH) among lung cancer patients aged greater than 18 years of age from September 2024 to February, 2025. Descriptive statistics was used to summarize demographic and histopathological characteristics.

Results

A total of 107 lung cancer patients were included in our study. The male:female ratio was 1.3 in our study, while the mean age of the patients was 67 years and standard deviation is 11 years. Squamous cell carcinoma (48%) and Adenocarcinoma (46%) were the major histological subtypes while only 6% cases were Small-cell carcinomas.

Conclusion

This study analyzes the histopathological and the demographic profile of lung cancer diagnosed at a single tertiary center of Nepal. Non-small cell lung cancer is the most common histological diagnosis in this study. Broader study is needed to explore the clinical and molecular associations.

Keywords

Histopathology; lung cancer; squamous cell cancer

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INTRODUCTION

Lung cancer remains the leading cause of cancer-related mortality globally, accounting for approximately 18% of all cancer deaths, with an estimated 2.2 million new cases diagnosed in 2020.¹ The incidence and mortality rates of lung cancer have continued to rise in many countries, representing a significant public health burden.¹ Lung cancer is characterized by diverse histological subtypes, with non-small cell lung cancer (NSCLC) being more common compared to small cell lung cancer (SCLC).²

Despite the global prevalence of lung cancer, epidemiological data from Nepal remain limited. According to GLOBOCAN 2022, Nepal recorded an estimated 22,008 new cancer cases and 14,704 cancer-related deaths, with lung cancer being the most frequent cancer in males (1,528 cases, 15.6 %) and the third most frequent in females (903 cases, 7.4 %).

A study of lung cancer in the Nepali population is vital to understand the epidemiological patterns and histological diversity, which can inform better diagnostic and therapeutic strategies. This study aims to bridge these gaps by investigating the histopathological characteristics of lung cancer in a cohort of patients from a tertiary care center in Nepal.

METHODS

This was an observational cross-sectional study conducted at Tribhuvan University Teaching Hospital (TUTH), a tertiary care center in Nepal. The study included patients diagnosed with lung cancer from September 2024 to February 2025, whose medical records contained documented histopathological status.

Patients aged 18 years or older with a histologically confirmed diagnosis of lung cancer (any subtype) were included. Patients were excluded if clinical or histopathology records were incomplete, or if they had coexisting malignancies or autoimmune diseases.

Data were collected from medical and histopathological records, including immunohistochemistry. Variables included age, gender, and histological subtype of lung cancer. Data were entered into Microsoft Excel, anonymized using unique identifiers, and validated by an independent reviewer. Descriptive statistics were used to summarize demographic and histopathological characteristics using SPSS 25.

Ethical approval was obtained from the Institutional Review Committee of IOM, with a waiver of informed consent granted due to the use of de-identified histopathological reports.

RESULTS

Age-distribution

A total of 107 patient records were included in the study. The mean age of the participants was 67 years and standard deviation is 11 years. The distribution of patients in various age-groups is shown in the Table 1.

Table 1. Age-wise distribution of lung cancer patients (n=107) diagnosed at TUTH

Age-group	Number
25-29	2
35-39	1
45-49	4
50-54	8
55-59	8
60-64	17
65-69	19
70-74	21
75-79	27

Sex-distribution

Among 107 patients with lung cancer, 60 (56%) were males and 47 (44%) were females. The male:female ratio was 1.3 in our study.

Histopathological distribution

The histological subtype of lung cancer as evidenced by the patient reports is elucidated in Table 2 below. Squamous cell carcinoma patient was 51 (48%) and Adenocarcinoma were 49 (46%) while only 7 patient (6%) were small cell carcinoma subtypes.

Table 2. Histological subtypes among lung cancer patients (n=107) diagnosed at TUTH

Histological subtype	Number (%)
Adenocarcinoma	49(46%)
Squamous cell carcinoma	51(48%)
Small cell carcinoma	7(6%)

Smoking history

Of note, among the 107 patients diagnosed with lung cancer, 71 patients, i.e. 66% of the patients had a current/past history of smoking.

DISCUSSION

This study tried to elucidate the basic demographic and histopathological status of lung cancer in a selected cohort of patients diagnosed at a tertiary care center in Nepal. Several studies have attempted to evaluate the histological profile of lung cancer in different cancer centers in Nepal.³⁻⁷ Lung cancer has been reportedly cited as the highest contributor of cancer-related mortality in Nepal.^{8,9} Considering the significant burden posed by lung cancer in Nepal, this study expects to contribute to the overall body of evidence relating to lung cancer's demographic and histopathological distribution.

Studies have shown non-small cell lung cancer as the predominant type of lung cancer in Nepal.^{3,4} Non-small cell carcinoma consists of adenocarcinoma, squamous cell carcinoma and large-cell carcinoma, and is said to comprise 75% to 80% of lung cancers globally.¹⁰ Though non-small cell lung cancer was found to be more prevalent in our study as well, its prevalence was around 94% with only remaining 6% cases contributed by small-cell lung cancer. In our study, among non-small cell lung cancers, cases were almost equally distributed between adenocarcinoma and squamous cell carcinoma. Among 111 cases reported by our study, not a single case of large cell carcinoma was found.

While some studies published in recent years in Nepal have shown increased incidence of adenocarcinoma over squamous cell carcinoma^{3,5}, others have reportedly revealed squamous cell carcinoma as more common^{4,6,7} However, global trends have shown adenocarcinoma(39%) to be more common than squamous cell carcinoma(25%) particularly in females. It is to be noted that compared to adenocarcinoma, squamous cell carcinoma of the lung is associated with worse prognosis and has greater incidence among male smokers.¹¹

The male: female ratio of lung cancer was found to be 1.3:1. Other studies in Nepal report lung cancer incidence to be somewhere between 1.5:1 to 1.7:1.^{4,12} The estimated global male: female ratio of lung cancer incidence stands at around 2:1.¹³ Lung cancer is considered a disease of old age globally with an average age at diagnosis at 70 years of age.¹⁴ Our study supports this data, with more than 60% of cases seen in patients above the age of 65 as elucidated in Table 1. Also, as evidenced in the table itself, the number of patients affected is seen to successively increase as the age-group rises.

This study has its limitations. It is inclusive of only 107 cases diagnosed in a single center in Nepal. Since lung cancer is a significant contributor to cancer burden nationally, definite conclusions regarding the demographic and histopathological distribution of lung cancer in Nepal can't be drawn from this study alone. However, the researchers aim

to continue documenting the cases of lung cancer at TUTH to inform evidence regarding lung cancer trends in Nepal. Also, this study was only able to comment on age, sex and histopathological status of lung cancer cases. Other variables like ethnicity, socio-economic variables, PD-L1 status, that could potentially affect both lung cancer incidence and prognosis weren't a part of this study. Further research should focus on a comprehensive study of all these variables in a broader cohort of lung cancer patients.

CONCLUSION

This study provides a preliminary overview of the demographic and histological characteristics of lung cancer patients in a single center in Nepal. In our study, non-small cell lung cancer (NSCLC) was the most common histological type, with squamous cell carcinoma being the predominant subtype among NSCLC cases. Further studies with larger sample sizes involving comprehensive clinicopathological, demographic, socio-economic and molecular characterization are warranted to uncover any associations and identify clinical implications or impact for lung cancer patients in Nepal.

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CONFLICT OF INTEREST

The author(s) declare that they do not have any conflicts of interest with respect to the research, authorship, and/or publication of this article.

AUTHOR CONTRIBUTIONS

Study concept and design: BP, RS, RSD; Data collection: BP, BP, RSD; Analysis and interpretation of data: BP, RSD, SK

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