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Patient Profile of Lung Tumor Disease at West Nusa Tenggara Provincial Hospital

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Abstract

Lung cancer remains one of the leading causes of cancer-related mortality worldwide, yet region-specific data in Indonesia remain limited. This study aimed to analyze the clinical and demographic profiles of lung tumor patients who underwent histopathological examinations at the West Nusa Tenggara Provincial Hospital (RSUDP NTB) in 2020. A cross-sectional descriptive study was conducted using total sampling, involving 28 patients who met the inclusion criteria. Data were collected from medical records and analyzed using descriptive statistics and chi-square tests with a significance level of $p < 0.05$. Results showed that lung tumors were more common in males (64.3%) than females (35.7%), and the most affected age group was 42–62 years (46.4%). Most patients resided in Lombok (82.1%) compared to Bima (17.9%). Histopathological findings revealed that non-small cell lung cancer (NSCLC) was the most common tumor type (82.3%). Statistical tests found no significant relationship between tumor type and age, gender, or residential address ($p > 0.05$). These findings suggest that demographic factors did not significantly influence the distribution of lung tumor types in this population. The study underscores the importance of local data in informing targeted screening and intervention strategies for lung cancer in regional healthcare settings.

Keywords: Lung cancer clinical profile; Histopathological tumor analysis; Regional cancer prevalence Indonesia; Demographic factors lung tumor.

INTRODUCTION

Lung cancer remains one of the most significant public health challenges globally, contributing to high morbidity and mortality rates (Shi et al., 2019). According to the World Health Organization (WHO, 2020), lung cancer accounted for approximately 1.8 million deaths worldwide, making it the leading cause of cancer-related mortality (Didier et al., 2024). This malignancy arises from uncontrolled cellular proliferation within the lung tissue, often forming masses or lesions, and has a high propensity for metastasis when not diagnosed early (Orrego et al., 2025). Despite advances in screening and therapy, the global burden of lung cancer continues to rise, particularly in low- and middle-income countries where access to early diagnostic services and effective treatment is still limited (Islam et al., 2021).

The etiology of lung cancer is multifactorial, involving both environmental and genetic factors (Gaur et al., 2020). Tobacco smoking remains the most well-established risk factor, responsible for more than 80% of all lung cancer cases (Kadam et al., 2018). Additional contributors include exposure to air pollution, occupational hazards such as asbestos, radon gas, and genetic susceptibility (Mohan et al., 2020). Clinical manifestations of lung cancer vary but often present late, including chronic cough, chest pain, hemoptysis, unexplained weight loss, and fatigue (Iyen-Omofoman et al., 2013). Early detection through imaging modalities such as chest computed tomography (CT), bronchoscopy with transbronchial needle aspiration (TBNA), and histopathological confirmation plays a crucial role in improving prognosis (Tong et al., 2022). However, disparities in diagnostic access, especially in decentralized health systems, often hinder timely detection and management (Quillet et al., 2024).

In Indonesia, lung cancer ranks among the top causes of cancer-related deaths, with a predominance in the male population (Saha et al., 2023). Despite the high burden, region-specific data concerning the demographic and clinical characteristics of lung cancer patients remain scarce (Ramani et al., 2020). Most national policies and clinical guidelines are developed based on generalized datasets, often lacking contextual specificity (Yang et al., 2023). This results in interventions that may not effectively address the unique epidemiological patterns present in different provinces or healthcare settings (Quillet et al., 2024). Furthermore, the absence of integrated hospital-based cancer registries in many provincial hospitals limits the ability to conduct evidence-based planning and resource allocation tailored to local needs (Yang et al., 2023).

Given the increasing burden of lung cancer and the lack of comprehensive local data, studies investigating the clinical and demographic profile of

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lung tumor patients—such as those treated at the West Nusa Tenggara Provincial Hospital—are essential (Gaur et al., 2020). By identifying key patient characteristics and risk factors, such research can contribute to the development of more targeted prevention strategies, improve early detection efforts, and support evidence-informed health policy at the regional level. In the long term, these efforts may provide a foundation for strengthening local cancer registries and fostering precision oncology initiatives in resource-limited settings.

MATERIALS AND METHODS

Time and Location

This study was conducted at the West Nusa Tenggara Provincial General Hospital (RSUD Provinsi NTB) in 2021. The data collection focused on patients diagnosed with lung tumor who underwent histopathological examination in 2020, which aligns with the use of hospital-based data collection in lung cancer research (Friis et al., 2020; Bucknell et al., 2020).

Study Design

This research was a quantitative descriptive study with a cross-sectional approach. The data were obtained from secondary sources, namely the medical records of lung tumor patients who underwent histopathological examination at RSUD Provinsi NTB in 2020. Cross-sectional and descriptive designs are commonly used to describe clinical and demographic characteristics in lung cancer studies (Palermos et al., 2022; Karrison et al., 2007; Bucknell et al., 2020).

Population and Sample

The study population comprised all patients diagnosed with lung tumors who underwent histopathological examinations at RSUD Provinsi NTB in 2020. A total of 28 patients met the inclusion criteria and were selected as the sample. The sampling method used was total sampling, a technique appropriate when the entire accessible population is small and meets the research criteria (Bucknell et al., 2020; Khan et al., 2020). The variables analyzed in this study included demographic factors (age, sex, residence), tumor classification (NSCLC, SCLC, other types), and histopathological results, which are standard variables in lung cancer epidemiological research (Palermos et al., 2022; Bucknell et al., 2020; Forsythe et al., 2020).

Research Procedures

The research procedure began with obtaining ethical clearance and access permission from the hospital. Patient data from histopathology records were then collected based on inclusion and exclusion criteria. The data were verified and coded into Microsoft Excel. Once compiled, the data underwent statistical processing using SPSS. Descriptive statistics were used to describe patient characteristics, and Chi-square tests were used to examine associations between tumor types and demographic factors, as is standard in similar studies (Palermos et al., 2022; Karrison et al., 2007; Bucknell et al., 2020).

Data Analysis

The data were analyzed using SPSS version 26.0. Descriptive statistics such as frequencies and percentages were used to describe the distribution of tumor types and patient characteristics. The Chi-square test was used to analyze the relationship between categorical variables such as tumor type with age, sex, and place of residence. Statistical significance was determined at a p-value < 0.05, which is a common threshold in clinical research (Palermos et al., 2022; Karrison et al., 2007; Bucknell et al., 2020).

RESULTS AND DISCUSSION

Results

After the data collection at the Prov. West Nusa Tenggara, from 28 research subjects taken based on inclusion criteria, the following results were obtained:

Characteristics Based on Patient Gender

In accordance with the inclusion and exclusion criteria, 28 research subjects were obtained. The following are the gender characteristics of the research subjects. Based on the results of the data that has been researched, it was found that the male gender amounted to 18 (64.3%) patients while women only 10 (35.7%) patients.

Table 1. Characteristics of research subjects by gender

Gender Characteristics	Patient	Presentase
	n= 28	(%)
Man	18	64,3%
Woman	10	35,7%
Total	28	100%

Based on the results of the data that has been studied in (Table 2), it was found that the male gender amounted to 18 (64.3%) patients while women were only 10 (35.7%) patients, with the most patients in the age range of 42-62 years, which was 13 (46.4%), followed by the age range of 21-41 years as many as 10 (35.7%) patients. Then the age range of 63-83 years with a total of 4 (14.3%) patients and the last in the age range of 0-20 years, namely 1 (3.6%) patients.

Table 2. Characteristics of research subjects by age

Age Characteristics	Patient n= 28	Presentase (%)
0-20 tahun	1	3,6%
21-41 tahun	10	35,7%
42-62 tahun	13	46,4%
63-83 tahun	4	14,3%
Total	28	100%

Characteristics Based on Residential Address

The results of the study of patient characteristics based on residential addresses are presented in Table 3. There are 23 (82.1%) patients who have residential addresses in Lombok while those from Bima are only 5 (17.9%) patients.

Table 3. Characteristics of research subjects based on address

Address of Patient Residence Percentage	Patient n= 28	Presentase (%)
Lombok	23	82,1%
Bima	5	17,9%
Total	28	100%

Tumor Type

The results of the research on the characteristics of the tumor type research subjects are presented in (Table 4). The distribution of lung tumor types in histopathology studies was 17 non-infectious patients and 11 infectious patients. Of the 17 non-infectious patients, most of them had NSCLC tumor type, namely 14 patients, followed by 2 patients with other types of tumors and 1 SCLC tumor type.

Table 4. Characteristics of the research subjects by type of tumor

Histopathological Results	Patient	Presentase
Infeksi	11	39,3%
Non Infeksi	17	60,7%
Tumor Type		
NSCLC	14	82,3%
SCLC	1	5,9%
Other Types	2	11,8%
Total	17	100%

Relationship of Age to Lung Tumor Type

The results of the research on subjects affected by non-infectious lung tumors, the results of the relationship between age and lung tumors in table 5 above were obtained that in the age range of 21-41 years there were 5 patients with NSCLC type tomography and 1 patient with SCLC type tom. In the age range of 42-62 years, there were 7 patients with NSCLC and none had SCLC or other types of tomori. In the age range of 63-83 years, there were 2 patients with NSCLC and 2 patients with other types of tumors.

Table 5. Hubungan Usia terhadap Jenis Tumor Pasien

Usia	Jenis Tumor			Total
	NSCLC	SCLC	Tipe Lain	
0-20 tahun	0	0	0	0
21-41 tahun	5	1	0	6
42-62 tahun	7	0	0	7
63-83 tahun	2	0	2	4
Total	14	1	2	17

Chi-Square Tests

	Value	Df	ymp. Sig. (2-sided)
Pearson Chi-Square	9.107[a]	4	.058
Likelihood Ratio	8.711	4	.069
Linear-by-Linear Association	2.802	1	.094
N of Valid Cases	17		

The data will be processed with a chi-square test to determine the relationship between the patient's tumor type and age. The chi-square test is used to determine the significance of the influence or relationship between variables in the data that has been categorized. In this study, data analysis was carried out with a significance level of $p<0.05$. The dependent variable is the type of tumor and the independent variable is the age of the patient. Based on the table above, it shows that there is no relationship between the type of tumor and the age of the patient ($p> 0.005$), there is no significant relationship between the number of patients in a certain age range and the type of tumor experienced, H0 is accepted.

Sex Relationship To Tumor Type

Berdasarkan variabel jenis tumor paru yang diteliti terhadap alamat tempat tinggal pasien, didapatkan sebagian besar pasien baik dari Lombok maupun dari Bima mengalami tumor jenis NSCLC yaitu sebanyak 9 pasien dari Lombok dan 5 pasien dari Bima. Berdasarkan tabel diatas, setelah dilakukannya uji statistik menggunakan chi square didapatkan hasil p value > 0,05 yaitu sebesar 0,468 sehingga dapat disimpulkan bahwa tidak ada hubungan antara jenis tumor terhadap alamat tempat tinggal pasien.

Table 6. Relationship of Tumor Type to Patient's Residential Address

Gender	Tumor Type			Total
	NSCLC	SCLC	Other Types	
Lombok	9	1	2	12
Bima	5	0	0	5
Total	14	1	2	17

Chi-Square Tests

	Value	Df	Asymp. Sig. (2- sided)
Pearson Chi-Square	1.518[a]	2	.468
Likelihood Ratio	2.348	2	.309
Linear-by-Linear Association	1.302	1	.254
N of Valid Cases	17		

DISCUSSION

Overview of the characteristics of the research subject based on the type of sex

Based on the results of the research data, it was Based on the results of the study, the number of lung tumor patients was more male than female, namely 18 (64.3%) men and 10 (35.7%) women. These findings are in line with global data showing that men have a higher lifetime risk of developing lung cancer and a higher mortality rate than women (May et al., 2023; Sharma, 2022). These differences are influenced by environmental factors such as higher smoking habits in men, as well as biological factors such as the role of sex hormones and the different immune responses between men and women (May et al., 2023; Siegfried, 2021). In addition, studies have also shown that men tend to have higher histological types of lung cancer and more frequent types of squamous-cell carcinoma, which contribute to higher mortality rates (Mincuzzi et al., 2024). Thus, the difference in incidence and mortality of lung cancer between men and women is the result of the interaction between behavioral, environmental, and biological factors.

Characteristics of Research Subjects by Age

Most of the lung tumor patients in this study were in the age range of 42–62 years (46.4%), followed by the age groups of 21–41 years (35.7%), 63–83 years (14.3%), and 0–20 years (3.6%). This distribution is in line with global data showing that the incidence of lung cancer increases with age, with the majority of cases occurring in middle to older age (Huang et al., 2022; Tas et al., 2013). Internationally, the highest incidence of lung cancer in men was recorded at the age of 85–89 years, while the highest in women was at the age of 75–79 years (Huang et al., 2022).

However, about 10% of lung cancer cases are also found in patients under the age of 55, and this young age group tends to have special characteristics, such as a higher proportion of women and a predominance of adenocarcinoma histology (Shi et al., 2021; Galvez-Nino et al., 2019; Sacher et al., 2016; Liu et al., 2019). Old age is a major risk factor for lung cancer due to the accumulation of DNA damage and shortening of telomeres over time, which increases the likelihood of genetic mutations and cell transformation into malignancy (Tas et al., 2013). In young patients, lung cancer is often found in advanced stages and has a tendency to therapeutic targeted genetic mutations, such as EGFR and ALK, so it is important to conduct molecular examinations in this group (Sacher et al., 2016; Liu et al., 2019; Fremand et al., 2024). Thus, the age distribution of lung cancer patients suggests that although the highest incidence occurs in adults and advanced age, cases at young age still need special attention due to their different clinical and molecular characteristics.

Characteristics of Research Subjects Based on Residential Address

The results of the data that have been researched found that 23 (82.1%) patients who have residential addresses in Lombok while those from Bima are only 5 (17.9%) patients. In a study conducted by Ratih (2011), it was stated that the prevalence rate of tumors will be higher in urban areas where in this study it is known that on the island of Lombok there is a

provincial capital. This can be attributed to more complete health facilities in urban areas, so that diseases are easier and faster to diagnose.12

Characteristics of Research Subjects Based on Tumor Type

The results of this study involving 28 patients showed that histopathological findings identified 17 patients with non-infectious tumors and 11 patients with infectious lesions. Among the 17 non-infectious cases, the majority were diagnosed with non-small cell lung cancer (NSCLC), accounting for 14 patients. This was followed by two patients with other tumor types and one patient diagnosed with small cell lung cancer (SCLC). These findings are consistent with previous studies stating that NSCLC accounts for approximately 85–90% of all lung cancer cases. Other studies similarly report that about 85% of lung cancer cases are of the NSCLC type, while only around 15% are SCLC. SCLC is known to be more aggressive than NSCLC, characterized by rapid growth and early metastasis.

Common sites of metastasis include the central nervous system, liver, and bones. Specific tumor markers can aid in differentiating between SCLC and NSCLC, with the most commonly used being thyroid transcription factor-1 (TTF-1), CD56, synaptophysin, and chromogranin. SCLC is also frequently associated with paraneoplastic syndromes. Due to its aggressive nature and tendency to be diagnosed after metastasis has occurred, the incidence of SCLC is lower compared to NSCLC.

The relationship between tumor type and patient age

Based on the table above, it was found that in the age range of 21-41 years there were 5 patients with NSCLC type tomor and 1 patient with SCLC type tomr. In the age range of 42-62 years, there were 7 patients with NSCLC and none had SCLC or other types of tumors. In the age range of 63-83 years, there were 2 patients with NSCLC and 2 patients with other types of tumors.

The results of the chi-square test showed that there was no relationship between the type of tumor and the patient's age ($p > 0.005$). This is in accordance with research conducted by Winston et al (2021) which said there was no relationship between the type of lung tumor and the age of the patient. The predominant factors for NSCLC and SCLC are the same, namely due to smoking habits. In a study conducted by Anish et al (2015), the average age of patients who experience NSCLC is 70 years, only a small percentage of patients suffer from NSCLC at the age of <40 years.14 Likewise, a study conducted by Winston et al. (2021) states that SCLS cases most often occur at the age of 60-80 years, so that SCLC and NSCLC mostly occur at an old age or >40 years. This is attributed to biological factors that include DNA damage over time and telomere shortening that occurs in old age, triggering the development of cancer cells.13

Relationship of tumor type to sex

Based on the results of research data on tumor types by gender, it was found that most male and female patients experienced NSCLC tumor types, namely 11 male patients and 3 female patients. The results of the chi-square statistical test did not find a significant relationship between tumor type and patient sex because $p = 0.059$ or greater than 0.05. Gender has no relationship with the type of tumor the patient can be associated with risk factors that cause the occurrence of tumor types, namely SCLC and NSCLC. The predominant factor for the occurrence of these two types of tumors is the patient's smoking habit. Studies have found that NSCLC, especially adenocarcinoma, is common in both women and men.13

Relationship of tumor type to residential address

The variables of the type of lung tumor studied on the patient's residential address, were found that most patients both from Lombok and Bima experienced NSCLC type tumors, namely 9 patients from Lombok and 5 patients from Bima. After a statistical test using chi square, the result was a p value of > 0.05, which is 0.468, so it can be concluded that there is no relationship between the type of tumor and the patient's residential address. This is associated with the main factors in the occurrence of NSCLC and SCLC. The patient's residential address was not mentioned as the main risk factor for the occurrence of NSCLC lung tumors i.e. smoking and radon exposure, whereas SCLC was associated with a history of smoking in almost 90% of patients.

CONCLUSION

Based on the results of a study on the profile of lung tumor patients who underwent histopathological examination at the West Nusa Tenggara Provincial Hospital during 2020, it can be concluded that men experience more lung tumors than women. The most

diagnosed age group is in the age range of 42 to 62 years. Most of the patients came from the Lombok Island area, compared to the Bima area. The most common type of lung tumor is non-small cell lung cancer (NSCLC). Based on the results of statistical tests, no significant relationship was found between the type of lung tumor and the patient's age ($p > 0.05$), the patient's gender ($p > 0.05$), or the patient's residential address ($p > 0.05$). These findings indicate that the distribution of lung tumor types at the NTB Hospital during 2020 was not statistically influenced by these demographic factors.

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