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Evaluation of demographic and clinical data of patients diagnosed with lung cancer: a single-center experience

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ABSTRACT

Aims: To retrospectively evaluate the demographic, epidemiological, and clinical characteristics of patients diagnosed with lung cancer.

Methods: Patients diagnosed and treated for lung cancer in our medical oncology clinic were included in the study. Patient records were obtained retrospectively from the electronic databases of the hospital. Demographic and clinical characteristics were recorded for each patient.

Results: A total of 313 patients diagnosed with lung cancer were included in the study. Mean age was 62.7±10.3 years. Of the patients, 83.4% were male and 16.6% were female. Most common presenting complaints were dyspnea (40.9%) and chest pain (32.2%). Smoking history was present in 66.5% of patients, and 15.3% had a history of tandoori smoke exposure. Radiologically, the most frequent tumor localization was the right upper lobe (38%). Most common histopathological types were squamous cell carcinoma (39.3%), adenocarcinoma (27.2%), and small cell carcinoma (20.1%). Most common disease stage at the time of diagnosis was stage IV (48.9%), followed by stage III (39%), II (10.9%), and I (1.3%). Mean OS was 14±1.4 (range, 11.2–16.8) months. Higher ECOG performance scores and advanced stage were associated with poorer survival. Mean OS was 31 months for females and 13 months for males.

Conclusion: The findings obtained in our study were found to be consistent with those of previous research. In Turkiye, the high prevalence of smoking, the asymptomatic nature of the disease, and the tendency of patients to attribute existing symptoms to smoking appear to contribute to delayed presentation to healthcare facilities, which likely plays a role in the high proportion of advanced-stage diagnoses. Additionally, unlike in other studies, the higher proportion of female patients diagnosed in our cohort was considered to be related to the widespread use of tandoori ovens in our region.

Keywords: Lung cancer, smoking, demographic

INTRODUCTION

Lung cancer is the most common cause of cancer-related mortality worldwide. Each year, 1.8 million individuals are diagnosed with lung cancer, and 1.6 million die from the disease. Five-year survival rates vary between 4% and 17%, depending on stage and regional differences.[1] Although the incidence and mortality of lung cancer are declining in developed countries, they continue to increase in developing countries. Lung cancer is the second most common malignancy after breast cancer among women and ranks second after prostate cancer among men.[2]

Lung cancer is generally classified into two types, including small-cell lung carcinoma (SCLC) and non-small-cell lung carcinoma (NSCLC). NSCLC accounts for 80–85% of all lung cancers. Less than 50% of NSCLC cases are resectable at the time of diagnosis, while approximately 25% present with locally advanced disease. In SCLC, about 30% of patients are diagnosed at the limited stage.[3] Surgical resection is the most effective treatment modality, particularly for early-stage lung cancer; however, it can be performed in only 20-25% of patients. For locally advanced disease, chemoradiotherapy and radiotherapy constitute the primary treatment approach.[4] This study aimed to evaluate the distribution of lung cancer subtypes, stages at presentation, and survival outcomes of patients who were admitted to and treated at our center.

METHODS

The study included patients that were diagnosed with lung cancer and followed up and treated at Yüzüncü Yıl University Dursun Odabaş Medical School Medical Oncology Department between January 2011 and June 2020. Patient data were obtained retrospectively from databases of the hospital. A data collection form was created to obtain clinical data of the patients. The study was initiated after obtaining an approval from Van Yüzüncü Yıl University Ethics Committee for Non-interventional Clinical Researches (Date: 16.10.2020, Decision No: 2020/07-17). The study was conducted in accordance with the principles of the Declaration of Helsinki. Age, gender, pathological subtype, comorbidities, presenting symptoms, date of hospital admission, smoking history, and demographic and clinical data at initial admission were recorded for each patient.

Histological classification was performed using the World Health Organization (WHO) classification. Patients with benign lung tumors, pleural tumors, or lung metastases were excluded from the study. Histological staging was carried out at the time of diagnosis based on the tumor, node, metastasis (TNM) classification system for lung cancer. Clinical staging was achieved according to the results of chest radiography, thoracic computed tomography (CT), bone scintigraphy, abdominal CT, brain CT, positron emission tomography CT (PET/CT), and other imaging modalities when available.

Statistical Analysis

Data were analyzed using SPSS for Windows version 22.0 (Armonk NY, IBM Corp. 2013). Descriptives were expressed as mean±standard deviation (SD), and minimum and maximum values for continuous variables and as frequencies (n) and percentages (%) for categorical variables. Continuous variables were analyzed with the Student's t-test for normally distributed data and with the Mann-Whitney U test for non-normal data. Proportions were compared between groups using the Chi-square test. When test assumptions were violated, Monte Carlo simulation was applied. Survival analyses were conducted using the Kaplan-Meier method. A p value of <0.05 was considered significant.

RESULTS

A total of 313 patients were evaluated, comprising 261 (83.4%) male and 52 (16.6%) female patients with a mean age of 62.7±10.3 years. Of the patients, 33 (10.5%) had never smoked and 208 (66.5%) had a history of smoking; smoking data were unavailable for 72 patients (23%). Among smokers, mean smoking exposure was 49.12±29.62 pack-years. A history of tandoori smoke exposure was present in 48 (15.3%) patients, predominantly female (93.7%), which was statistically significant (p<0.01). Nineteen (6%) patients had a history of both tandoori smoke exposure and cigarette smoking, all of whom were female. Mean body height, weight, BMI, and BSA were 167.99±8.41 cm, 68.94±15.25 kg, 24.23±4.87 kg/m², and 1.77±0.19 m², respectively. According to the ECOG Performance Status Scale, most patients were ECOG 1 or 2 (40.9% each). Comorbidities were present in 138 (44.6%) patients, with coronary artery disease being the most common. The most frequent presenting symptom was shortness of breath (40.9%). At diagnosis, most patients were in stage IV (48.9%), followed by stage III (39%). Poorly differentiated tumors were the most common (56.9%). Tumor localization was most frequently in the right upper lobe (38%) (**Table**).

Tablo. Demographic and clinical characteristics of the patients

		n	%
Gender	Yes	261	83.4
	No	52	16.6
Smoking	Yes	208	86.3
	No	33	13.7
Tandoor exposure	Yes	48	15.3
	No	265	84.7
Performance status	ECOG 0	31	9.9
	ECOG 1	128	40.9
	ECOG 2	128	40.9
	ECOG 3	23	7.3
	ECOG 4	2	1.0
Comorbidity	No	175	55.4
	Coronary artery disease	48	44.6
	Hypertension	43	
	Chronic obstructive pulmonary disease	33	
	Other	14	
Symptoms	Dyspnea	128	40.9
	Chest pain	101	32.2
	Other	81	27.9
Diagnostic method	Bronchoscopy	209	66.5
	Surgery	39	12.5
	Transthoracic biopsy	28	8.9
	Metastasis	25	8.0
	Pleural fluid	12	3.8
Histopathological diagnosis	Squamous cell carcinoma	123	39.3
	Adenocarcinoma	85	27.2
	Small cell carcinoma	63	20.1
	Other	42	13.4
Stage	4	153	48.9
	3	122	39.0
	2	32	10.2
	1	4	1.3
Grade	Well differentiated	6	3.1
	Moderately differentiated	78	40.0
	Poorly differentiated	111	56.9
Tumor location	Right upper lobe	115	38.0
	Left upper lobe	86	28.4
	Right lower lobe	48	15.8
	Left lower lobe	37	12.2
	Right middle lobe	17	5.6

The table continues

Tablo. Demographic and clinical characteristics of the patients (The table continues)

	Gender	Mean±SD	p
Age (years)	Female	58.25±10.33	0.054
	Male	61.33±10.42	
	Overall	62.7±10.3	
Body surface area (m^2)	Female	1.72±0.20	0.08
	Male	1.78±0.18	
	Overall	1.77±0.19	
Body-mass index (kg/m^2)	Female	27.79±6.14	0.01
	Male	23.67±4.29	
	Overall	24.23±4.87	

SD: Standard deviation

Bronchoscopy was the most commonly used diagnostic method (66.5%), and squamous cell carcinoma was the most frequent histopathological subtype (39.3%). Squamous cell carcinoma was more common in men, whereas adenocarcinoma was more common in women, with a statistically significant difference (p=0.003) (**Figure 1**).

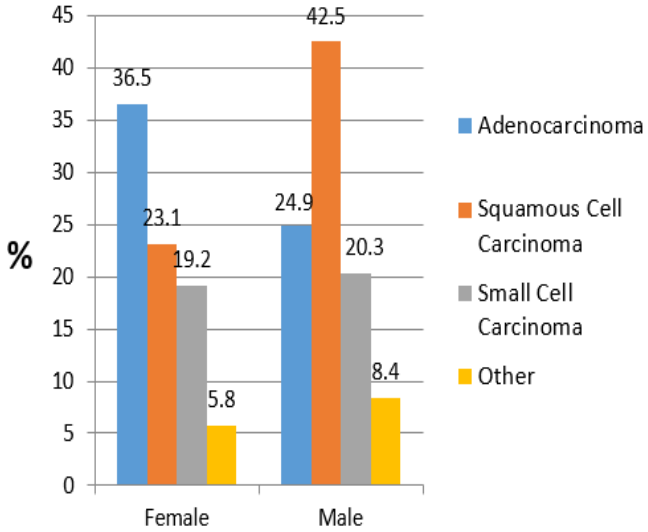

Figure 1. Histopathological frequency of lung cancer according to gender

A significant association was found between histopathological subtype and disease stage (p<0.001); squamous cell carcinoma was more commonly diagnosed at stage III, while adenocarcinoma and small cell lung carcinoma were mostly diagnosed at stage IV (**Figure 2**). During follow-up, 242 (77.8%) patients died, with a mean overall survival (OS) of 14±1.48 months. Mean OS decreased with worsening ECOG score and advanced disease stage (p<0.001) (**Figure 3**). Mean OS was 46, 17, and 8 months for patients with stage II, III, and IV, respectively (p<0.001) (**Figure 4**). Mean OS for squamous cell carcinoma, adenocarcinoma, and small cell carcinoma was 17, 13, and 11 months, respectively. Women had significantly longer mean OS compared to men (31 vs. 13 months, p<0.001) (**Figure 5**).

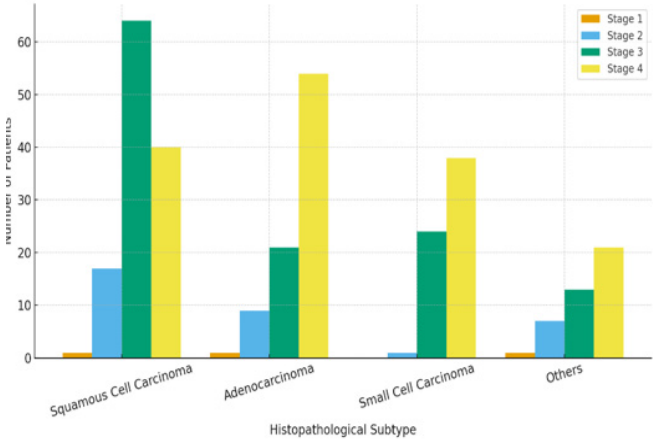

Figure 2. Histopathological type-stage relationship

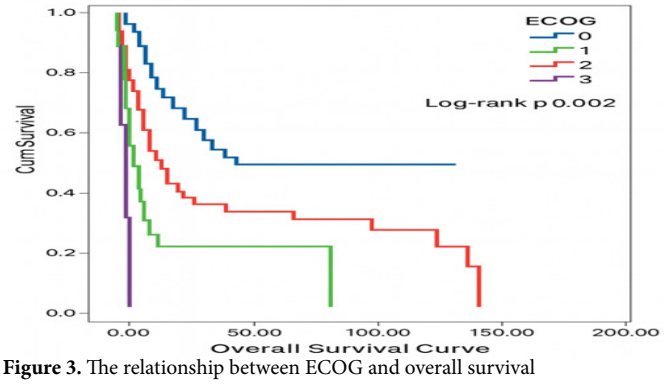

Figure 3. The relationship between ECOG and overall survival

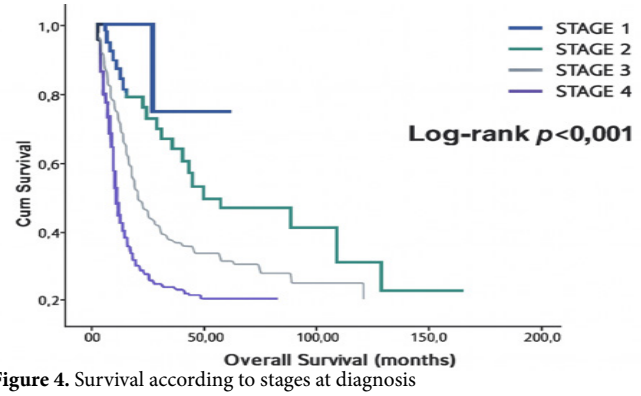

Figure 4. Survival according to stages at diagnosis

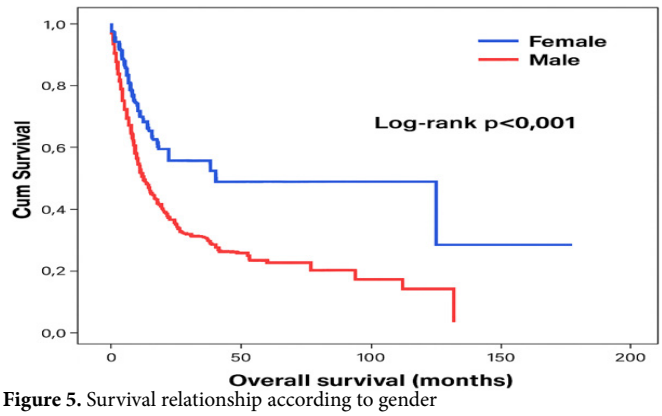

Figure 5. Survival relationship according to gender

DISCUSSION

Lung cancer was a rare disease in the early 20th century and has recently increased in incidence due to a surge in tobacco product consumption. Moreover, it has become the most commonly diagnosed cancer worldwide.[5] According to data from the International Agency for Research on Cancer (IARC), a total of 1,352,132 people are diagnosed with lung cancer each year, including 965,241 men and 386,891 women, and 1,180,000 people die from lung cancer annually.[6] In a study involving 5,628 cases of primary lung cancer, mean age at diagnosis was found to be 65.4±11.0 years for all patients, 64.2±11.4 years for women, and 66.3±10.7 years for men.[7] In our study, 313 patients were aged between 20 and 90 years and had a mean age of 62.7±10.3 years. Additionally, mean age at diagnosis was 61.3±10.4 years for men and 58.2±10.3 years for women.

A study conducted in Poland involving 20,561 lung cancer patients reported a male-to-female ratio of 6:1.[8] Likewise, a study conducted in Turkiye in 2011, which included 9,504 patients, found a male-to-female ratio of 6.2:1.[9] In our study, 83.4% of the patients were male and 16.6% were female, resulting in a male-to-female ratio of 5:1.

The WHO World Cancer Report showed that the risk of developing lung cancer is 20 times higher in smokers compared to non-smokers. Additionally, it was also reported that squamous cell carcinoma and SCLC are more commonly seen in smokers, while adenocarcinoma is more frequent in non-smokers.[10] In our study, 10.5% of patients had never smoked, while 66.5% of them had a history of smoking. Nevertheless, smoking history data was not available for 23% of the patients. Among smokers, mean smoking exposure was 49.12±29.62 pack-years. Among all smoking patients, 92.1% of men and 56.4% of women were smokers. Additionally, a history of tandoori smoke exposure was present in 15.3% of the patients.

In patients with chronic obstructive pulmonary disease (COPD), the risk of developing lung cancer is 3-4 times higher compared to smokers with normal respiratory function. In a study involving 5,887 patients, lung cancer was reported as the most common cause of death in patients with COPD, accounting for 33% of deaths.[11] In our study, most common comorbidities were coronary artery disease and hypertension, and COPD was observed in only 33 patients.

In patients with lung cancer, 75% present with one or more symptoms at the time of diagnosis. Symptoms vary depending on the primary tumor, pattern of intrathoracic metastasis, distant metastases, and paraneoplastic syndromes. In a study involving 3,547 patients, most commonly observed symptoms included cough (51.6%), chest pain (44.2%), shortness of breath (34.8%), sputum production (21%), weight loss (19%), hemoptysis (14.19%), fatigue (12.7%), and loss of appetite (10.7%). It was also found that 0.65% of patients were asymptomatic.[12] In our study, however, most frequent symptom was shortness of breath (40.9%) and chest pain was the second most common symptom (32.2%).

It is well established that lung cancer localizes more frequently in the right lung than in the left and that it mostly involves the upper lobes.[13] Consistently, in our study, most common localization was the right upper lobe (38%).

Sputum cytology is the most non-invasive technique used in the diagnosis of lung cancer. Fiberoptic bronchoscopy is the key diagnostic method for lung cancer. During diagnostic bronchoscopy, various techniques may be employed, including forceps biopsy, bronchial brushing and aspiration, transbronchial fine needle aspiration, transbronchial lung biopsy, bronchoalveolar lavage, and post-bronchoscopy sputum examination.[10] In our study, bronchoscopy was the most frequently used diagnostic method (66.5%), followed by surgical intervention (12.5%).

In a study conducted with 5,628 patients diagnosed with lung cancer, adenocarcinoma was identified in 45.3% of cases, squamous cell carcinoma in 23.7%, NSCLC of unspecified subtype in 12.1%, SCLC in 11.3%, large-cell carcinoma in 2.8%, and mixed histology in 1.1%.[7] According to data from the Lung Cancer Mapping Project in Turkiye (LCMPT), the most common subtype was reported to be squamous cell carcinoma (29.2%), followed by NSCLC of unspecified subtype (23.3%), adenocarcinoma (16.9%), and SCLC (15.4%). Of these, adenocarcinoma was the most common subtype in women (55.9%) as opposed to squamous cell carcinoma in men (49.3%).[14] In our study, the most common subtype was squamous cell carcinoma (39.3%), followed by adenocarcinoma (26.8%) and SCLC (20.1%). As consistent with the literature, the most frequent subtype was squamous cell carcinoma in men (42.5%) and adenocarcinoma in women (36.5%), and this difference was statistically significant. This difference was considered to be related to gender-specific variations in smoking history.

The literature indicates that there is no clear evidence explaining the higher survival in females compared with males.[15] Adenocarcinoma is more common in females compared to males. Women also demonstrate better treatment response regardless of stage, treatment modality, or histopathology.[16] In a previous study conducted in Turkiye, mean OS was reported as 23.4 months for men and 18.1 months for women.[17] Likewise, in our study, mean OS was 31 months in women and only 13 months in men.

In a study conducted by Kefeli et al.,[18] mean OS was reported as 12 months for squamous cell carcinoma, 11.9 months for adenocarcinoma, 15.2 months for SCLC, and 10.9 months for unspecified subtypes, with no significant difference observed. In another study involving 80 patients, although there was no significant difference at the time of initial diagnosis, patients with adenocarcinoma were observed to live longer than those in the other NSCLC group (13.6 months vs. 9.5 months). This difference was attributed to the longer doubling time of adenocarcinoma.[19] In our study, the mean OS calculated for the three most common histopathological subtypes (squamous cell carcinoma, adenocarcinoma, and small cell carcinoma) was found to be 17, 13, and 11 months, respectively, and no significant difference was observed.

In a study conducted at the Mayo Clinic involving 5,628 patients diagnosed with lung cancer, it was reported that among NSCLC patients, 34.9% were diagnosed at stage IV, 30.3% at stage III, 8.4% at stage II, and 26.4% at stage I.

Among SCLC patients, 53% were diagnosed at an advanced disease stage.[7] In a study conducted in Turkiye including 11,849 lung cancer cases, 40.4% of NSCLC patients were diagnosed at stage IV, while 62.1% of SCLC patients were diagnosed at an advanced disease stage.[14] In our study, 49% of the patients were diagnosed at stage IV.

Among all types of lung cancer, approximately 80% of patients have an OS of about one year, and the 5-year survival rate is 5-15%. Patients with NSCLC have a better prognosis than those with SCLC. Prognosis worsens with advancing stage; the 5-year survival rate is about 70% in stage I, 30-50% in stage II, 10% in stage III, and even lower in the presence of metastasis.[20] In our study, mean OS according to disease stage at diagnosis was consistent with the literature: 46, 17, and 8 months for stage II, III, and IV, respectively. Nevertheless, OS could not be calculated for stage I.

Prognostic factors influencing survival in lung cancer have been examined in numerous studies. In a study involving 172 patients with stage IV NSCLC, an ECOG performance score of >2 was identified as a poor prognostic factor.[21] In our study, mean OS for patients with ECOG 0, 1, 2, and 3 scores was 33, 14, 14, and 5 months, respectively. There were only two patients with ECOG 4, and their OS was found to be less than one month. Consistent with previous studies, higher ECOG performance scores were shown to have a negative effect on survival.

Limitations

Our study has several limitations, including a single-center, retrospective design, a small number of patients, heterogeneous study groups, and the lack of molecular subgroup analysis.

CONCLUSION

As a result, lung cancer, which is most often diagnosed at an advanced stage, represents a major public health problem. Although advances in diagnostic and therapeutic methods have provided positive effects, a rapid decline in mortality rates has not been achieved. The findings obtained in our study were found to be largely consistent with those of previous research. Based on our findings, we consider that in Turkey, where smoking is highly prevalent, the tendency of patients to attribute their symptoms to smoking as well as the lack of symptoms leads to delayed hospital admission and contributes to the high proportion of advanced-stage diagnoses. As recommended in the National Comprehensive Cancer Network (NCCN) guidelines, we believe that annual low-dose CT for early lung cancer detection is of vital importance in high-risk individuals, regardless of the presence of symptoms. In addition, unlike in other studies, the higher proportion of female patients diagnosed in our cohort was considered to be related to the widespread use of traditional tandoori ovens in our region. Further etiological studies, particularly in our region, are needed.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was initiated after obtaining an approval from Van Yüzüncü Yıl University Ethics Committee for Non-interventional Clinical Researches (Date: 16.10.2020, Decision No: 2020/07-17).

Informed Consent

As this was a retrospective study, formal written informed consent was not required and was therefore not obtained.

Peer Review Process

This manuscript was subject to external peer review.

Conflict of Interest

The authors declare no conflicts of interest related to this study.

Financial Disclosure

The authors received no financial support for the conduct or publication of this research.

Author Contributions

Concept: M.M.K., M.N.A.; Design: M.M.K., M.N.A., M.E., S.E.; Control: M.M.K., M.N.A., M.E., S.E., O.A., Ş.E.; Resources: M.M.K., M.N.A., M.E.; Materials: M.M.K., M.N.A.; Data Collection and/or Processing: M.M.K., M.N.A.; Analysis and/or Interpretation: M.M.K., M.N.A., M.E., S.E.; Literature Review: M.M.K., M.N.A., M.E., S.E.; Writing the Article: M.M.K., M.N.A., M.E., S.E.; Critical Review: M.M.K., M.N.A., M.E., S.E., O.A., Ş.E.

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