

## Lung cancer in females: Military cancer center experience in Jordan

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### Abstract

**Objective:** to evaluate the clinical properties, pathological properties and the survival data for 80 lung cancer female patients who were managed in our center.

**Methods:** this retrospective study included 80 female patients with lung cancer that were treated in The Military Cancer Center of the Jordanian Royal Medical services between January 2022 and January 2024, the patients pathological, clinical and survival data will be reviewed and analyzed.

**Results:** group age was between 41 to 82 years (mean of  $60.18 \pm 11.72$ ). 82.5% of patients were diagnosed with non-small cell lung cancer (NSCLC), 17.5% of patients had small cell lung cancer (SCLC), 30% of patients were smokers. Significant weight loss was observed in 40% of patients. Comorbidity was present in 43.75% of patients with hypertension being the most common one 36.25%. Adenocarcinoma was the most common histological subtype 56%. The one-year survival rate was 70% and the two-year survival rate was 37.5%.

**Conclusion:** our study showed that advanced stage, weight loss, poor ECOG score and NSCLC subtype were a main prognostic factors in females with lung cancer in Jordan.

**Keywords:** Female; Lung cancer; Smoking, Jordan; Survival; Adenocarcinoma

### 1. Introduction

Lung cancer is considered number one cause of deaths related to cancer in males worldwide and it is considered the second leading cause to cancer related deaths in females after breast cancer.(1)

The incidence of lung cancer in females has a wide range between (0.6 - 35.6) thousand percent, this range depends on the geographical area.(2) Due to the anti-smoking worldwide consciousness and campaigns the mortality related to lung cancer has been reduced among males while in females there has been a significant rise in the mortality related to lung cancer, this could be attributed to the increased number of female smokers.(3)

In comparison to males a variety of features differ among females such as the etiology, the histological type of cancer or the rates of survival of lung cancer, however smoking still the main risk factor among both genders.(4) Other related risk factors for lung cancer in non-smokers are passive smoking, exposure to asbestos, radon, genetic and hormonal factors.(5) In our study we aim to evaluate the clinical properties, pathological properties and the survival data for 80 lung cancer female patients who were managed in our center.

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## 2. Methods

The medical records of 80 female patients with lung cancer are analyzed retrospectively. The targeted group of patients have been treated in The Military Cancer Center of the Jordanian Royal Medical services between January 2022 and January 2024. The patients pathological, clinical and survival data will be reviewed and analyzed.

The analysis of data will be on the histopathological type of lung cancer, the stage of cancer, the performance status, the presence of weight loss, hemoglobin level, age, smoker or not, and the presence of comorbidities (hypertension, diabetes mellitus and coronary artery disease).

The performance status of the patients before initiating the treatment will be reviewed and evaluated using the performance scoring of Eastern Cooperative Oncology Group (ECOG).<sup>(6)</sup> Using the American Joint Committee on Cancer (AJCC) TNM (8<sup>th</sup> edition) the stages of cancer will be determined.<sup>(7)</sup>

Significant weight loss will be defined as weight loss of >10 % in the last six months at the time of the diagnosis. The hemoglobin level obtained from the routine blood test that was done before the treatment.

The obtained data will be statistically analyzed using Statistical Package for the Social Sciences for Windows.; ver 24. (Armok. NY: IBM Corp) software for statistical analysis.

## 3. Results

There were 80 female patients in our study aged between 41 to 82 years (mean of  $60.18 \pm 11.72$ ), of those 49 patients (61.25%) aged less than 65 years and 31 patients (38.75%) aged 65 years and above. In our study group there were 66 patients (82.5%) diagnosed to have non-small cell lung cancer (NSCLC) and 14 patients (17.5%) to have small cell lung cancer (SCLC). The histopathological subtypes were found to be 56% adenocarcinoma (37 patients), 16.67% squamous cell carcinoma (11 patients), 15.15% large cell carcinoma (10 patients) and in 12.12% are neuroendocrine carcinoma (8 patients), **Table 1.** 24 patients (30%) were smokers. Regarding significant loss of weight was positive in 32 patients (40%). 35 patients (43.75%) were found to have comorbidity, those was as following: 29 patients (36.25%) with hypertension, 12 patients (15%) with diabetes mellitus and 11 patients (13.75%) with coronary artery disease. The ECOG scores were found to be 0 in 26 patients (32.5%), 1 in 39 patients (48.75%) and score of 2 and above in 15 patients (18.75%). Regarding the stage of the disease; 3 patients (3.75%) of NSCLC were stage 1, 9 patients (11.25%) were stage 2, 22 patients (27.5%) stage 3 and 32 patients (40.0) % were stage 4. Staging in the SCLC patients was as following: 6 patients (7.5%) to have limited stage and 8 patients (10%) to have extensive stage, **Table 2.**

**Table 1** Histological type and subtype of lung cancer in females

Type	Number of patients	Percentage %
Non-small cell lung cancer	66	82.5%
Small cell lung cancer	14	17.5%
Total	80	100%
Non -small cell lung cancer subtypes		
Adenocarcinoma	37	56%
Squamous cell carcinoma	11	16.67%
Large cell carcinoma	10	15.15%
Neuroendocrine carcinoma	8	12.12%

**Table 2** Risk factors in female patients with lung cancer

		Number of patients	Percentage %
Age	<65 years	49	61.25%
	≥65 years	31	38.75%
Smoking	Yes	24	30%
	No	56	70%
Weight loss	Yes	32	40%
	No	48	60%
Comorbidities	yes	35	43.75%
	No	45	56.25%
Hypertension		29	36.25%
Diabetes mellitus		12	15%
Coronary artery disease		11	13.75%
Initial ECOG	ECOG 0	26	32.5%
	ECOG 1	39	48.75%
	ECOG ≥2	15	18.75%
NSCLC stage	Stage 1	3	3.75%
	Stage 2	9	11.25%
	Stage 3	22	27.5%
	Stage 4	32	40.0%
SCLC stage	Limited	6	7.5%
	extensive	8	10%
ECOG Eastern Cooperative Oncology Group, NSCLC non small cell lung cancer, SCLC small cell lung cancer			

**Table 3** treating modality type and numbers

Type	Number of patients	Percentage %
Surgery	14	17.5%
chemoradiotherapy	25	31.25%
Systemic treatment	37	46.25%
Palliative care	4	5.00%

Regarding the treatment, 14 patients (17.5%) had surgery (either with or without adjuvant therapy), 25 patients (31.25%) had chemoradiotherapy (either with consolidative management or not), 37 patients (46.25%) had systemic treatment (Chemotherapy, immunotherapy or targeted treatment) and palliative management was applied in 4 patients (5.0%), **Table 3**. The overall survival (OS) during the follow up period was as the following: one-year OS was (70%) and two-years OS was (37.5%). The factors that affected the rate of survival were NSCLC subtype, advanced stage, weight loss and low ECOG score at time of diagnosis.

#### 4. Discussion

Worldwide it is estimated that 1 in 17 women over their life time will develop lung cancer, and over 600,000 women die each year from lung cancer.(8) According to the world health organization lung cancer remains the leading cause of death related to cancer estimated to be 1.8 million deaths 18% in 2020, unluckily about 58% of newly diagnosed lung cancer cases occur in the developing countries.(9)

Even though lung cancer occurs more frequent in males, it is considered a serious threat for females today. In our country Jordan, according to the data from Jordan Cancer Registry published in 2022; lung cancer is the 8<sup>th</sup> most common cancer in females and it is the 3<sup>rd</sup> most common cause of mortality related to cancer among females.(10)

Smoking is considered the leading cause for lung cancer in both males and females, approximately responsible for 85% of cases, and among smokers about 20% develop lung cancer.(11) According to the data from our country Jordan in 2022, it is estimated that tobacco users and smokers are 2.77 million people, 2.29 million of them are males and 483,000 are females,(12) and this number are increasing. In our study, the results showed that 30 % of our female patients got history of smoking. The literature shows that the rates of non smoker female patients who develop lung cancer are 20%,(13) however in our study the number of non smoker females was higher 70%, we think this is related to passive smoking, environmental factors like using wood based ovens and heater, and to the social embarrassment of females in our country to admit the fact they are smokers or had a history of smoking.

When evaluating the histological subtypes of lung cancer, it appears that SCLC makes between 17-34% of lung cancers in females according to the literature,(14) and in our study results it shows that SCLC rate 17.5% which is keeping in line with the literature.(15) Adenocarcinoma is considered the most common subtype of NSCLC that is present in females making about 60% of the cases. However, squamous cell lung cancer which related to smoking occurs in 30% of females with lung cancer which is less than male rates,(16) in our study results it shows that 56% of females had adenocarcinoma, 16.67% had squamous cell carcinoma, 15.15% had large cell carcinoma and 12.12% had neuroendocrine carcinoma.

A number of published studies shows that survival is being better in females than males,(17) this could be attributed to females being respond better to platinum-based chemotherapies and this response being significant more in the adenocarcinoma.(18)Our study results show one-year survival rate of 70% and two-year survival rate of 37.5% in patients which is consistent with the literature.

Many prognostic factors play an important role in lung cancer, of those are: weight loss, advanced stage, male gender, poor performance status and non-surgical treatment are considered the most unfavorable ones.(19) In our study the results show that weight loss and advanced stage are negative prognostic factors for lung cancer in female patients.

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#### 5. Conclusion

Lung cancer among females is a major health issue in our country. The low ECOG score, advanced stage, weight loss and squamous cell lung cancer all are identifiable risk factors that affect the survival. More studies with larger numbers among female patients with lung cancer need to be done in order to investigate the etiological and prognostic factors besides smoking in our country.

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#### Compliance with ethical standards

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##### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

##### *Statement of ethical approval*

The present research work does not contain any studies performed on animals/human subjects by any of the authors.

### Statement of informed consent

Due to the retrospective nature of this study, Informed consent from patients was waived.

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