Lung Cancer Among Women, Attention Need?

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Abstract
Background: Lung cancer is a disease can affect anyone during their lifetime but it is more increase in smokers. It is not only disease of men, it also affect woman. Smoking women are a victim of lung cancer along with non-smoking women. Globally, in the last decade's lung cancer incident increase among women so this study aim to assess characteristics of lung cancer among women. **Method:** It was a descriptive study carried out at the Holy City of Karbala, included 92 women diagnosed with lung cancer. Information collected including, age, smoking history, histopathological types and staging. **Results:** Median age of patients at diagnosis was 63 years old. The highest rate of patients diagnosed at 60 -69 age group (35.9%). 25% of women their age less than 55 years old. Adenocarcinoma is the most common histopathological type represented 39.1% of patients. 58.7% of women were smoker. 90% were stage 3 and 4 at diagnosis. **Conclusions:** Ages of women in this study were younger than reported in developed countries. Majority of patients were diagnosed at advance stage that leads to decrease opportunity to cure. Hence, tobacco smoking control and screening program are require for early diagnosis of disease to improve survival, also attention need for young non-smoker women to be included in the screening program.
Keyword: lung cancer, women, tobacco smoking.

1. Introduction

Worldwide, Lung cancer is the most common cause of cancer death in men and women and is the third most common type of cancer in women after breast and colorectal cancer.[1]

In the United State, about 238,340 new cases (117,550 in males and 120,790 in females) of lung cancer will be diagnosed during 2023. It is the second most common type of cancer in American women after breast cancer (13%) and the first cause of cancer death among them.[2,3] About 1 in 16 men and 1 in 17 women will be diagnosed with lung cancer in their life time. [3]

In the United Kingdom, lung cancer is the second most common cancer in females (13%); about 48% of lung cancer cases are in females, and 52% are in males. During the last years, the age-standardised incident rate of lung cancer in British women increased by 13%, and in men, the rate decreased by 12%.[4]

Historically, lung cancer has been the disease of smoker men, but in the last few decades the incidence of lung cancer cases in men were has decreased while it has elevated in women, as women started smoking later than men .Thus, lung cancer incidence peaked for men in 1980, followed by women 20 years later. Then the decline in lung cancer began after the tobacco control program was started. [5] Lung cancer decline at a slower rate in women than in men because they are slower to quit smoking than men.[2]

Tobacco smoke is the major risk factor for lung cancer.[6] Global variation in lung cancer incidence among women is highly attributed to the rate of tobacco consumption. In some countries, the incidence of women's lung cancer has touched the incidence of men's lung cancer, as in some Europeans countries and Northern America, while it is still low in countries where smoking is still low and has peaked recently among women, as in African and some Asian countries.[1]

Non-small cell lung cancer (NSCLC) represents 80-85% of all lung cancers, including adenocarcinoma, squamous cell carcinoma and large cell carcinoma, while small cell lung cancer (SCLC) accounts 15%.[7] Adenocarcinoma is the most common histopathology among women, specially non-smoker.[8] Women with NSCLC diagnosis are younger and at an earlier stage than men. The survival advantage in women is higher than that in men, particularly among adenocarcinoma.[9]

Hence, the current study is concerned with assessing women's lung cancer characteristics with regard to age, histopathological type, stage at diagnosis and smoking behavior.

2. Method

In this descriptive study, we are enrolling 92 women who have been diagnosed with lung cancer. The study was conducted at Al-Imam Al-Hussein hematology /oncology center in the Holy city of Karbala between March 2021to December 2022. The presented study was carried out using a structural questionnaire that included age, smoking history, histopathological types, staging and the site of tumor in the lungs.

Patients included in this study confirm having lung cancer depends on their histopathological report. Histopathological classification according to WHO guide line including non-small cell lung cancer (adenocarcinoma, squamous cell carcinoma, large cell carcinoma and other sub type) and small cell lung cancer.10 Fifteen cases were mentioned as "non- specific NSCLC" because histologically they could not be classified as a sub type of NCSLC.

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The staging was performed depending on the results of X-rays, Computerized tomography scans, bronchoscopic finding and any other available investigations, according to the American Joint Committee on Cancer (AJCC), which was determined by the primary tumor (T), regional lymph node involvement (N), and metastasis (M) system.11 In this study, patients were classified according to their smoking history as: "never smokers," defined as a person who has never smoked or smoked fewer than 100 cigarettes during lifetime; "light smoker, " defined as a person who smokes 1-10 cigarettes per day; "moderate smoker," defined as a person who smokes 11-19 cigarettes per day; and" heavy smoker," defined as a person who smokes 20 cigarettes or more per day.[12]

Statistical analysis: the analysis of data carried out by the statistical package for social science (SPSS version 25 software) included descriptive statistics.

3. Results

A total of 92 women diagnosed with lung cancer were enrolled in this study. The mean age of patients was 60.67 ±11.39 years, and the median was 63 years. The oldest patient was 87 years old, while the youngest was 32 years old. 57 (62 %) patients were below 65 years old and 35 (38%) were 65 years and above , the most occurrence of lung cancer in women their age range between 60 -69 years represented 33 (35.9%) patient. 25% 0f patients were younger than 55 years old (Figure 1).

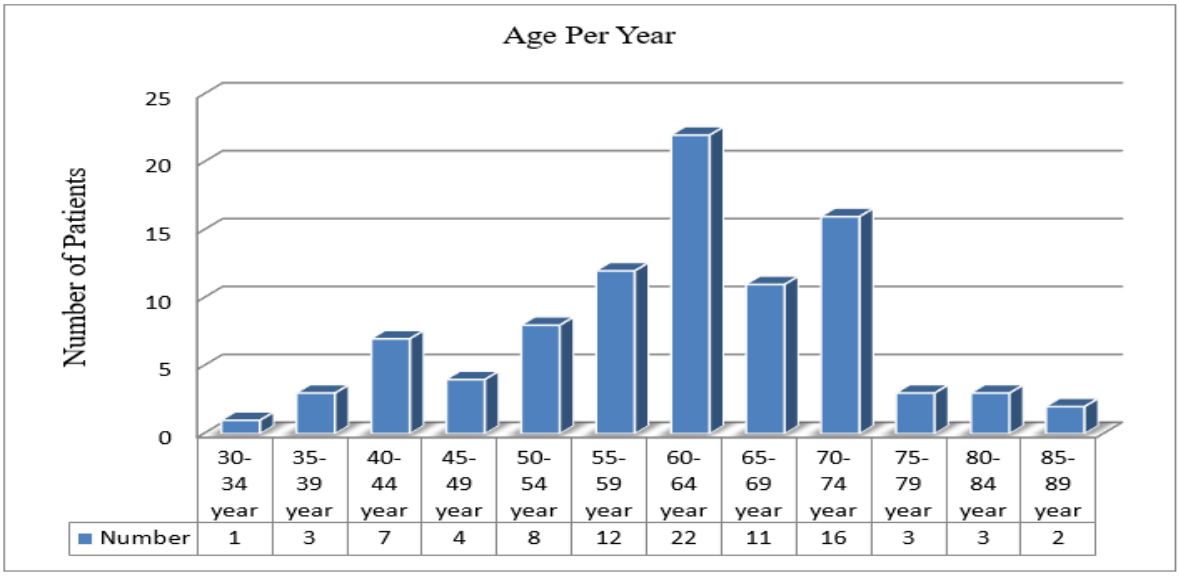

Figure 1. Distribution of Patients According to Their Age Group

Fifty four (58.7%) patients out of 92 women were cigarette smokers, and thirty eight (41.3%) patients were non-smokers. Among smokers, 74.1% of them were heavy smokers, and only 7.4% of them had stopped smoking 15 years ago or more. 72.2% of smoker women in this study smoked for a period of time covering two decades or more (Table 1).

Table 1.Smoking History.		
	Number/ Total	Percentage %
Smoker	54/92	58,7%
Non smoker	38/92	41.3%
Type of smoking		
Light smoker	6/54	11.1%
Moderate smoker	4/54	7.4%
Heavy smoker	40/54	74.1%
Stop smoker	4/54	7.4%
Duration of smoking		
20 year or more	39/54	72.2%
Less than 20 year	11/54	20.4%
Stop smoking	4/54	7.4%

Table 2 shows that 79 (85.9%) patients were histopathologically confirmed to have non-small cell lung cancer, while small cell lung cancer was detected in 13 (14.1%) patients. Among NSCLC, adenocarcinoma is the most common histopathological type 36 (39.1%), followed by squamous cell carcinoma 26 (28.3%).

Among the patients who were diagnosed with adenocarcinoma, 58.3% were non-smoker. On the other hand, most patients who were diagnosed with small cell carcinoma and squamous cell carcinoma were smokers 92.3% and 76.9% respectively (Table 2).

Table 2. Histopathological Types Among Smokers and Non-Smokers						
Histopathology Type	Total		Smokers		Non smokers	
	Number	%	Number	%	Number	%
Adenocarcinoma	36/92	39.1 %	15/36	41.7 %	21/36	58.3 %
Squamous	26/92	28.3 %	20/26	76.9 %	6/26	23.1 %
NSCLC/ non-specific	15/92	16.3 %	7/15	46.7 %	8/15	53.3 %
SCLC	13/92	14.1 %	12/13	92.3 %	1/13	7.7 %
Large cell	2/92	2.2%	0/2	0%	2/2	100%
Total	92		54		38	

Nearly half of the patients presented with metastasis disease at diagnosis, 49 (53.3%) patients were stage IV and 34 (36.9%) patients were stage III. In this study, most women were diagnosed at an advanced

stage of their disease, but only nine (9.8%) of them were diagnosed with stage II. 53.3% of lung cancer was located in upper lobe; 33.6% was located in the lower lobe and 10.9% at middle lobe (Table 3).

Table 3. Tumor Characteristics		
Site of Tumor		
	Number/Total	Percentage%
Right lung	49/92	53.2%
Upper lobe	22/49	44.9%
Middle lobe	10/49	20.4%
Lower lobe	17/49	34.7%
Left lung	41/92	44.6%
Upper lobe	27/41	65.8%
Lower lobe	14/41	34.2%
Bilateral lobe	2/92	2.2%
Stage of Disease		
Stage II	9/92	9.8%
Stage III	34/92	36.9%
Stage IV	49/92	53.3%

4. Discussion

In Iraq, lung cancer is the second most common cancer; it's the most common cancer in men, whereas in women it is the eighth most common cancer type, according to Data from Globocan 2020.13 In the Kurdistan region of Iraq, in Erbil governorate, lung cancer in women ranks fourth among cancer types.14 In Turkey, lung cancer rates in women rank fourth.15

Lung cancer is highly related to age, with the highest incidence rates being in older people. In the United Kingdom, more than 44% of new cases of lung cancer occurs each year in individuals aged 75 and above, with the incident rate being lower in females than males mainly in the older age group.4

In the United States, where Lung cancer largely diagnosed in the elderly, the average age of patients at diagnosis is about 71, and nearly 80% of patients diagnosed with lung cancer were 65 years of age or older.2 In our study, women were younger; about 62% of women with lung cancer were younger than 65, and the median was 63 years. Also among Asian women, average age was 66.46.16

Data from cancer research United Kingdom show that the highest age-specific incident rates in female are in 75 to 79 age group and in male are in the 85 to 89 age group. 4 In this study the most occurrence of lung cancer in women, whose age range between 60 -69 years represented 35.9%, which is younger than in developed countries. This finding could be explained by the higher life expectancy in developed countries compare with developing countries.

Jemal and his colleagues found that among the young age group (30-54 years), more women were diagnosed with lung cancer than men.17 In our study, we found that 25% of women diagnosed with lung cancer were younger than 55 years old.

Worldwide, adenocarcinoma is the most common histopathological subtype of lung cancer in both women and men.8 Similarly, our findings show that adenocarcinoma is the most common histopathological type, representing 39% of lung cancer in women, followed by squamous cell carcinoma at 28.3%. A Swedish study also found that about 44% of lung cancer diagnoses in women were adenocarcinomas, while about 37% were squamous cell carcinomas.9 As well, among Turkish patients, the most common histopathological type was adenocarcinoma (68.9%).15 Among American women, Adenocarcinoma is the most common type of lung cancer, which is possibly linked to the use of filtered cigarettes.2

Whereas, Small cell lung cancer was detected in 14% of women with lung cancer in the United States, slightly higher than men's (13%).3 Corresponding to our finding, about 14% of patients had small cell lung cancer.

All histopathological types of lung cancer are associated with smoking, however, with the strongest association being with small cell and squamous cell carcinoma and a less strong associated with adenocarcinomas. 8 This supports our result, which shows that 58.7% of women with lung cancer were smokers, with a highly prevalent smoking pattern among small cell and squamous cell carcinomas (90% and 76% respectively). Whereas adenocarcinoma is less common in smoker women (41%).

In the last years, smoking prevalence has increased in women, resulting in increased cases of lung cancer among them.18 lung cancer is highly linked to smoking activities, including duration of smoking and number of cigarette smoked per day.6 Smoker women had 25 time risk to develop lung cancer than non-smoker.19 Papadopoulos and his colleague's suggested that heavy smoking might put women at higher risk of developing lung cancer compared to men; this could be related to sex difference such as hormonal and genetic mutations.20 Among smoker women in this study, about 74 % were heavy smokers, and 72.4% smoked cigarettes for 20 years or more during their lifetime.

Globally, lung cancer in non-smokers was more common in women than men.21 About 50% of lung cancer cases were diagnosed in non-smoking women, compared with 15- 20% in non-smoking men. Also, there is geographical variation, as in Asia, 60-80% of lung cancer cases occur in non-smoker women, but among Americans, 19% of lung cancer diagnoses are in non-smoker women and only 9% in non-smoker men.22 Adenocarcinoma is the most common histopathological type in non-smoking women.8 In the current study, 41% of patients were non-smoker, more than half of them (58%) were diagnosed with adenocarcinoma.

We found that more than half of lung cancer were located in the upper lobe (53%), and 33% were located in the lower lobe, similar to data from cancer research United Kingdom (48% in the upper lobe and 26% in the lower lobe).4

In United States Most of lung cancer were diagnosed in stage 3 and 4, 75.6% in male versus 72% in female.23 The study in four Arab Gulf countries finds

that 76.3% of non-small cell lung cancer was diagnosed in the advance stage.24 In this study, about 90% of women were diagnosed with stage 3 and 4, and nearly 50% of them were stage 4. Also, 50% of Turkish patients with lung cancer were diagnosed at an advance stage, and 30% were locally advanced.15 Most cases are diagnosed at an advanced stage; this delay may be a result of poor community awareness about lung cancer and absence of a screening program, especially among non-smoking women.

Survival for lung cancer is high for women than men, even in the advanced stages. 25 Moreover, lung cancer highly incident in young age and non-smoker women than men. 17

Lung cancer screening guidelines mainly depend on age and smoking behaviours to assess the risk for lung cancer, but this can lead to excluding young people and non-smokers.25, 26

Warner ET and his collage's found that women were 32% less likely than men to discuss lung cancer screening with healthcare givers.27 As a result, women with lung cancer need more attention regarding the screening program in order to be diagnosed at early stage to improve survival.

In conclusion, the ages of women in this study were younger than those reported in developed countries. Although lung cancer is highly related to age and smoking history, about 25% of women in this study are younger than 55 years old, and nearly 40% are non-smokers. Adenocarcinoma is the common histopathological type among non-smokers, and small cell and squamous cell carcinoma among smokers. Majority of patients were diagnosed at advance stage that may lead to loss chance to cure. This finding reflects a delayed diagnosis and the absence of a screening program, and it also could be a result of poor tobacco control. Further hard work is needed to control smoking and establish screening programs for early diagnosis of disease to improve survival. On the other hand, attention needs to be paid to young, non-smoking women to be included in the screening program.

References

Sung H, Ferlay J, Siegel RL, et al. Global Cancer Statistic 2020: GLOBOCAN estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin. 2021;71:209. doi: https://doi.org/10.3322/caac.21660

Siegel RL, Miller KD, Wagle NS, et al. Cancer Statistic, 2023. CA Cancer J Clin. 2023;73(1):17-48. doi: https://doi.org/10.3322/caac.21763

American Cancer Society. Cancer Fact & Figure 2023. Atlanta: American Cancer Society; 2023.

Cancer Research UK, https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/lung-cancer/incidence . Accessed [February][2023].

barta JA, Powell CA, Wisnivesky JP. Global Epidemiology of Lung Cancer. Annals of Global Health. 2019; 85(1): 8, 1-16. doi: http://doi.org/10.5334/aogh.2419

Chiang A, Detterbeck FC, Stewart T, et al. Non-Small-Cell Lung cancer. In DeVita VT Jr, Lawrence TS, Rosenberg SA, eds. DeVita, Hellman and Rosenberg's cancer: principles & practice of oncology. 11 th ed. Philadelphia: Wolters Kluwer, 2019.

Walder D. Prevention and screening. In Brien M, Besse B, Awad MM, eds. Fast Fact: Non-Small Lung Cancer. 2nd ed. UK: Karger, 2022:9-20.

North CM, Christiani DC. Women and lung cancer: what's new?. Semin thoraco cardiovasc surg. 2013;25(2). doi: http://doi.org/10.1053/j.semtcvs.2013.05.002

Radkiewics C, Dickman PW, Johansson ALV. Sex and survival in non-small cell lung cancer: A nationwide cohort study. PLoS ONE. 2019;14(6):e0219206. doi: http://doi.org/10.1371/journal.pone.0219206

WHO Classification of Tumors Editorial Board. Thoracic Tumor. 5th ed. Lyon, France: International Agency for Research on Cancer; 2021.

Amin NG, Greene FL, Edge SB, et al. AJCC Staging Manual, 8th ed: Springer International Publishing; 2017:1024.

Canada.ca. Tobacco Use Statistic, Terminology. https://www.canada.ca/en/health-canada/services/health-concerns/tobacco/research/tobacco-use-statistics/terminology . Access [February], [2023].

Global Cancer Observatory: Cancer Today. Globocan 2020. International Agency for Research on Cancer. https://gco.irac.fr/today/data/factsheets/populations/368-iraq-fact-sheet-pdf. Accessed [February] [2023].

Amen K, Abdulla O, Amin A, et al. Cancer Incidence in Kurdistan Region of Iraq: Results of a seven-year cancer registration in Erbil and Duhok Governorates. Asian Pac J Cancer Prev 2022;23(2),601-615. doi: https://doi.org/10.31557/APJCP.2022.23.2.601

Cangir AK, Yumuk PF, Sak SD, et al. Lung cancer in Turkey. J Thorac oncolo 2022;17(10): 1158-1170. doi: https://doi.org/10.1016/j.jtho.2022.06.001

Jin K, Hung RJ, Thomas S, e al. Hormonal factors in association with lung cancer among Asian women: A pool analysis from the International Lung Cancer Consortium. IJC 2021;148(9):2241-2254. doi: https://doi.org/10.1002/ijc.33405

Jemal A, Miller KD, Ma J,et al. Higher lung cancer incidence in young women than young men in the United States. N Engl J Med 2018;378:1999. doi: https://doi.org/10.1056/NEJMoa1715907

Rusmaully J, Tvardik N, Martin D, et al. Risk of lung cancer among women in relation to lifetime history of tobacco smoking: a population-based case-control study in France (the WELCA study). BMC Cancer 2021;21:711. doi: http://doi.org/10.1186/s12885-021-08433-z

Tasi L, Chu N, Blessing W, et al. Lung cancer in women. Ann. Thorac. Surg. 2022;114(5):1965-1973. doi:

https://doi.org/101016/j.athoracsur.2021.09.060
Papadopoulos A, Guida F, Leffondré K, et al. Heavy smoking and lung cancer: Are women at high risk? Result of the ICARE study. Br J Cancer.2014;110(5):1385-1391. doi: https://doi.org/10.1038/bjc.2013.821
Zhang T, Joubert P, Ansari-Pour N, et al. Genomic and evolutionary classification of lung cancer in never smoker, Nat. Genet 2021. doi: http://doi.org/10.1038/s41588-021-00920-0
Dobin S, Griffin D. Lung cancer in non-smokers. Mo Med. 2020;117(4):375-379.
Tolwin Y, Gillis R, Peled N. Gender and lung cancer-SEER-base analysis. Ann Epidemiol 2020;46:14-19. doi: http://doi.org/10.1016/j.annepidem.2020.04.003
Jaafar H, Mohieeldin A, Mohsen R, et al. Epidermal growth factor receptor (EGFR) positive non-small cell lung cancer (NSCLC) patients in the Gulf region: Current status, challenges, and call for action. J. Cancer Prev.Curr.Res. 2020;11:130-134. doi: http://doi.org/10.15406/jcpcr.2020.11.00440
Ragavan M, Patel MI. The evolving landscape of sex-based differences in lung cancer: a distinct disease in women. Eur. Respir. J 2022;31:210100. doi: http://doi.org/10.1183/16000617.0100-2021
Ji G, Bao T, Li Z, et al. Current lung cancer screening guideline may miss high-risk population: a real-world study. BMC Cancer 2021;21:50. doi: https://doi.org/10.1186/s12885-020-07750-z
Warner ET, Lathan CS. Race and sex differences in patient provider communication and awareness of lung cancer screening in the health information National Trends Survey, 2013-2017. Prev Med 2019;124:84-90. doi: http://doi.org/10.1016/j.ypmed.2019.05.001