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A Study on the Mortality Rate from Lung Cancer in Polluted Areas in Baghdad Governorate

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Abstract

In this study, data was collected for 98 people who died of lung cancer from Al-Kindi Hospital in Baghdad Governorate for the years 2021 and 2022. It was revealed through this study that the majority of the deceased were male, with a percentage of 74.48%, while the percentage of women who died of lung cancer was 25.52% The highest age group for the deceased was between 60-69 years, at a rate of 34.7%. The study also showed that the highest percentage of deaths was in the year 2022, reaching 52.1%. The results of the study also showed that the highest percentage of the deceased lived in Al-Shaab City in Baghdad, at a rate of 13.26% The lowest death rate was in the Zayouna area in Baghdad

Keywords: lung cancer, Al-kindi Hospital, Baghdad governorate, motility

Introduction

Uncontrolled proliferation of lung cells, which can metastasize to lymph nodes and even the brain, is the hallmark of lung cancer (1). One of the leading malignant tumors that kills people globally is lung cancer, which is also called bronchial cancer (2). With over 10 million new cases reported globally each year (3), lung cancer ranks top among men's cancers and second among women's (behind breast cancer). Among male cancers diagnosed in 2020, lung cancer accounted for 15.4%. With 12.5% and 12.2% of all new cases, respectively, of breast cancer and lung cancer in 2020 (4), these cancers were the most common worldwide. Based on the nationwide study that covered the period from 1995 to 2015, lung cancer was ranked as the most common cancer in males (16.7%) and the fifth most common cancer in women (4.2%) in Iraq (5,6). The health care sectors, infrastructure, and services in Iraq were severely damaged by the decades of conflict and destruction (7, 8). Despite a lack of preventative initiatives, the rates of obesity, smoking, physical inactivity, and bad eating—all of which are risk factors for certain cancers—have lately risen in Iraq. Cancer rates in Iraq have been on the rise, affecting various organs and tissues. Health managers, stakeholders, and legislators can better prioritize illnesses and distribute resources when they have access to reliable quantitative data on the burden of cancer trends (9). Because of this, changes in cancer prevalence rates, which are encouraged by disease control efforts, may occur (10). Breast cancer and lung cancer were the most common types of cancer between 2013 and 2019 in Iraq, especially in the governorates of Erbil and Dohuk. The most common type of cancer in females was breast cancer, while lung cancer was the leading type in males during the seven years of the study (11). Cancer is considered a major cause of death, as the percentage of deaths from cancer during the past twenty years averaged 6.2% of all deaths that occurred. The mortality rate increased from 4.1% in 1985 to 6.6% in 1995 and to 7.7% in 2005. This shows an increase in cancer cases, and thus deaths resulting from cancer cases, or a relative decrease in deaths resulting from causes other than cancer. This is according to a number of studies conducted in southern Iraq (12,13,14). There

was a dramatic rise in cancer-related fatalities in 2018, with 9.6 million people losing their lives. In underdeveloped nations, where healthcare is scarce and other risk factors, such political and economic instability, are on the rise, the projected results are very bleak (15). For both sexes, lung cancer ranks high in terms of mortality rates. One in five people die from cancer in 2018, with an estimated 1.8 million victims (1.2 million men and 576,100 women) (16, 17). Among both sexes, lung cancer accounts for the majority of cancer-related fatalities in the US (18, 19). About 23.5% of all cancer-related deaths in 2019 are anticipated to occur in 2019, with an estimated 142,670 deaths. There are 51.6 male fatalities for every 100,000 people and 34.4 female fatalities for 100,000 people (20). Since lung cancer is often detected in its early stages, the 5-year survival rate for patients diagnosed with the disease has shown only modest increases compared to other kinds of cancer in the US in recent years. In the latter stages, when chances of survival are extremely low (18,19). Surgical excision and early diagnosis are the only ways to achieve optimal control, however 85 percent of cases are inoperable when diagnosed. Another approach to illness prevention is the use of lasers, chemotherapy, radiotherapy, and, more recently, immunotherapy (21). Eighty percent of lung cancer patients die after a year of diagnosis, and fewer than five percent survive five years after diagnosis, indicating a generally very bad prognosis (22).

Materials and working methods

The number of lung cancer deaths was determined in this statistical analysis by analyzing cancer death records from Al-Kindi Teaching Hospital in Baghdad Governorate for the years 2021 and 2022. Descriptive statistics (frequency and percentages) were used to statistically examine the data, which included the sex, age, and residency of the deceased.

RESULTS

Through the study, we found that the number of people who died from lung cancer during the years 2021 and 2022 in the study areas and those registered at Al-Kindi Teaching Hospital in Baghdad Governorate reached 98 people, both males and females. We found through the study that the percentage of males who died from lung cancer was 74. 48%, while the percentage of deceased women was 25.52% and the ratio of males to females is 2.9:1, As shown in table No. (1)

Table (1) the show the percentage of people died from lung cancer

The year	**Total**	
Sex	**No.**	**%**
Male	**73**	**74.48**
Female	**25**	**25.52**
Total	**98**	**100**

The study also showed that the highest percentage of deaths was in the year 2022, at 52.1%, while the percentage of deaths in 2021 was 47.9%the figure (1)

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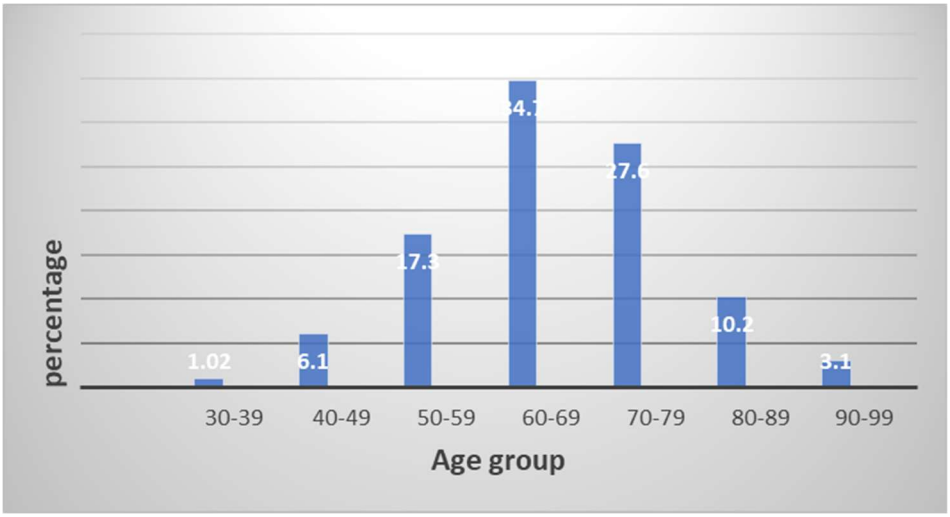
Figure (1) shows the percentage of people died from lung cancer within a year 2021,2022.

The study showed that the highest death rate was in the 60-69 age group, at 34.7%, while the lowest rate was in the 30-39 age group, at 1.02%. figure (2)

Figure(2)show the percentage of people died of lung cancer in the age group



The study showed that the highest percentage of deaths from lung cancer for women was in the age group 70-79, where their percentage reached 36%. While males were the in the age group 60-69 their percentage 35.61 % table (2)

Table (2) shows the percentage of age group based on gender.

		Male	Female		Total	
Age-group	NO.	%	NO	%	NO	%
30-39	1	1.37	0	0	1	1.02
40-49	5	6.84	1	4	6	6.1
50-59	13	17.8	4	16	17	17.32

60-69	26	35.61	8	32	34	34.7
70-79	18	24.65	9	36	27	27.6
80-89	8	11	2	8	10	10.2
90-99	2	2.73	1	4	3	3.06
Total	73	100	25	100	98	100

Through the study, it was found that the highest area inhabited by the deceased was the Al-Shaab area, where their percentage reached 13.26%, followed by the New Baghdad area, with a percentage of 9.18%, while the lowest number of dead people was in the areas of Bab Al-Muadham, Zayouna, and Bab Al-Sharji, where their percentage reached 2.04%. There were also 26 areas in which a case appeared. Only one death out of total deaths table (3)

Table (3) shows the areas of lung cancer deaths occurred

The area	No	%	The area	NO	%
Sha'ab area	13	13.26	Hayy Ur area	3	3.06
New Baghdad area	9	9.18	Karrada area	3	3.06
Sader City area	8	8.16	Binouk area	3	3.06
Al-Ameen area	7	7.21	al-qanaa area	2	2.04
Al-selakh area	5	5.1	Al-Rashad area	2	2.04
Al-Fadila area	4	4.08	Zayouna area	2	2.04
Adhamiyah area	4	4.08	Bab Al-shargy area	2	2.04
Nahrawan area	3	3.06	Bab Al-Moatham area	2	2.04
other areas	26	26.53	Total	98	100

Discussion

Based on our findings, 98 individuals lost their lives to lung cancer in 2021 and 2022 at Al-Kindi Teaching Hospital, which is a quite high amount for a single healthcare facility. With an estimated 1.8 million fatalities in 2018 (1.2 million in men and 576,100 in women), or one in five cancer-related deaths globally, lung cancer is the top killer of males and the second-leading killer of females. From a historical and global perspective, lung cancer has consistently ranked first in cancer diagnoses (16,17). Lung cancer ranks first in both men and women in the US when it comes to cancer-related deaths (16, 17). In this study, we found that the percentage of males who died from lung cancer was 74.48%, while the percentage of females was 25.52% and the ratio of males who died from lung cancer to females who died from lung cancer was 2.9:1, Our study is consistent with Al-Rahim's findings that the incidence of lung cancer among males reached 71.8 in Baghdad Governorate, and the ratio of males to females was (2.5:1) (23).

This finding is in line with previous research in Iraq by Al-Hasani (24), as well as the Iraqi Cancer Registry Center's findings showing a male-to-female lung cancer incidence ratio of 2.9:1. According

to the national survey that covered the period 1995-2015, lung cancer was the most frequent disease in Iraq. It accounted for 16.7% of male cancer cases and ranked sixth among Iraqi women with a rate of 4.2%. (5, 6). Additionally, the study found that the highest death rate occurred in 2022 with 52.1%, while the lowest rate was 47.9% in 2021. Corona illness has a direct impact on the lungs, and an infection in a lung cancer patient almost certainly results in death, thus it's possible that this is the cause of the high mortality rate in 2022. Compared to patients without cancer, those with cancer have a higher risk of severe COVID-19 or mortality, according to two prior meta-analyses on the topic (25, 26). According to Matthew and Michelle (2019), Survival rates for lung cancer patients have remained low, with just a 5-year survival rate, despite substantial gains for the majority of cancers in the US in recent years. Indeed, they have. Reason being, survival rates are low and most patients do not receive a diagnosis until much later (20). From 2013 to 2019, the most common cancers in the Dohuk and Erbil governorates were lung and breast cancers. For seven years in a row, the overall cancer incidence rate reached 100,000 people, regardless of gender (2013-2019). Breast cancer was the most prevalent malignancy in women, while lung cancer was the most common malignancy in men (11).

Among those aged 60–69, the mortality rate reached an alarming 34.7%. This finding is in line with what Jassim and Baher (2020) found: that among patients in Babil Governorate with lung cancer, the rate was 43.3% in the 60-69 age group (27). By the way, our data also revealed that the areas of Al-Shaab and New Baghdad had the highest and lowest percentages of deceased people, respectively, with 13.26% and 9.18% of the deceased, and 2.04% of the deceased lung cancer patients residing in the Zayouna area. Out of all the lung cancer deaths, 26 were in places where the death toll was quite low. The bulk of Baghdadis living in the popular, densely populated suburbs of Al-Shaab and New Baghdad are from lower- or middle-class backgrounds. Additionally, the American Cancer Society discovered that cancer mortality rates are 28% higher in low-income counties compared to high-income ones in the US, and that these rates are over 40% higher for men in low-income counties (19). Among both sexes, men and women, lung cancer claims the lives of more people than any other cancer. With a per-patient expense of about $15,000 USD, this becomes more problematic in low- and middle-income nations (28).

According to earlier research, SES is an umbrella term for describing a person's or group's social standing or "class" based on factors such as their wealth, education level, and occupation. Multiple interaction pathways involving resources, psychological and physical stresses, health-related behaviors, and risk factors link socioeconomic status to illness and health. Tobacco use may be greater and quitting attempts lower among those with lower socioeconomic status (SES), which is one of the risk factors for lung cancer (29) If you believe what Kim et al. Lung cancer rates fluctuate by smoking type, gender, age, socioeconomic position, and location, according to research by Torre et al. In the US, lung cancer was more common in rural areas, among men, and among those with lower socioeconomic standing. A number of nations, like the US, UK, and Australia, are seeing declining rates, particularly among males, while others, where smoking is still prevalent, are seeing rising rates. About half of all lung cancer incidences and fatalities occur in nations with lower middle incomes (30,31). Prevalence, mortality, and survival rates for lung cancer vary by race and ethnicity.

Mostly this disparity in socioeconomic status can be explained by the accompanied risk factors that lead to diseases, as well as prevention programs that rely mainly on high-quality screening detection and early treatment. Similarly, Hovanec (2018) found that the risk of men suffering from lung cancer was 1.84 times as widespread in countries with a lower International Socioeconomic Index status, and women had a 1.54 times larger risk to develop the disease in those same countries (32). Lung cancer risk takes a pathway either for light or heavy tobacco users. The main risk factor, smoking (33) can be

found in almost everyone.

The smoke of tobacco, that is it combustion products, contains more than four thousand components including different carcinogenic and other harmful substances (34). Almost in 80 to 90% of lung cancer cases in the US individuals who smoke are suffering from this disease, whereas only 15% smokers suffer from the lung cancer (Hu, 2018). Cumulative Risk based on smoke and health is 20 times higher and lung cancer likely for a smoker. A non-smoker has low risk. Besides, it is observable that the only factor of cigarettes that increase the risk of lung cancer is the tendency of smoking which is dependant on the number of cigarettes smoked per day and duration of smoking (35). The carcinogen generated when tobacco products are burned is in turn the primordial source of lung cancer cases. Its risk can be estimated with one of the many models. The risk of the person being sickly as to the degree of their smoking habit, the period they have smoke, and the extent of secondhand ones do influence the risk level. Unfortunately, many times other LCICs are neglected because the main factor, (namely) smoking, is so common and strong. A radioactive gas, radon, nearly odorless, tasteless, and invisible, comes from the radioactive decay of uranium and thorium;, it is one of the many factors that when present around, lets to be included when other reasons for development of lung cancer are considered.

Radon is a radioactive element that exists in nature and is dangerous to all organisms on earth but the degree of this family gas (the radon isotope) may vary depending on the place. Radon has a role in carcinogenesis of lung and is responsible for 3%-14% of all LC worldwide. The percent concentration of radon by way of the method of measurement and by the visual changes detected of radon concentration will vary. In the US, exposure to radon is believed to be responsible for 21,000 lung cancer fatalities annually, which is about 13% of all lung cancer deaths (40). According to the European Trade Union Institute (ETUI), behind radon, at least one in ten cases of lung cancer is due to workplace exposure to carcinogenic substances (41). Occupationsally workers with exposure to arsenic, cadmium, beryllium and chromium as well as diesel exhaust and those involving iron and steel foundries, paint and aluminuim manufacturing, coal gasification, coke production, underground jobs for hematite mining and rubber industry are believed by many to be the enough evidence of causing lung cancer in humans (40). Lung cancer carries grim forecasts of survivability – higher than 5% chance of surviving after only 5 years and 80% of patients passing away within a year after diagnosis – which only aggravates the high overall mortality rate of these patients.Conclusions (9). COPD is an irreversible disease that can be classified under chronic obstructive pulmonary disease. It is due to the inflammation that can be observed in the small airways and alveolar. This leads to the remaining of the passageways narrowed and the alveoli being separated. Bronchial chronic inflammation, through its repeated reoccurrence (41), may play a role in the lung cancer progressions due to its pulsing nature.

On the other hand, a probable association between COPD and lung cancer would be deduced from the statistics. According to an existing meta-analysis of published studies, the risk of having COPD is 2 to 3 times more likely when someone has experienced COPD, emphysema or chronic bronchitis. Asthma is manifested by the airway in overactivity and excessive secretion of mucus and very sensitive reaction; chronic inflammation of the lungs usually accompany it. In addition, the developmental process of lung cancer is also dependent on the inflammation trying to link asthma with lung cancer risk as well.(number 43). Pulmonary tuberculosis infections are often highly damaging to the genetic material, sometimes causing genetic mutation. These genetic changes coupled with chronic inflammation and fibrosis of the lungs might be the reasons why lung cancer is commonly associated with pulmonary tuberculosis (44).

The pooled analysis and meta-analysis of Inter national Lung Cancer Federation revealed that lung

cancer developed by 48% and 76% in those who had tuberculosis previously (45). Ambient pollution or second hand smoking, there are a few environmental conditions that could up your odds of being diagnosed with lung cancer. Non-smoking passive exposure, radon gas, ionizing radiation, occupational exposure, existing lung disease, radon, radon gas genetically, and carcinogenic viruses are the most significant risk factors for lung cancer (in other words, chance for lung cancer) (46). While the chances of death from lung cancer is reduced with primary prevention measures like quitting smoking, but there is still a long way to be a safe person to those who smoked their development in the past. In the case of patients who have stopped smoking and are at the high risk group, current method of early diagnosis is the only option available. Better risk evaluation, improved early detection, diagnosing, and treating of lung cancers are all necessary to reduce the overall burden of lung cancer, which is predicted to remain a big healthcare issue worldwide in the 21st century (48).

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Ethical Clearance: Official permission taken by the Cancer Center official at Marjan Educational Hospital, Babel, Iraq.

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