

# Lung Cancer in One Decade What Happen at Medical City Complex: A Hospital Based Study

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**Abstract:** Background: Lung cancer is one of the most common causes of death in the world. It's causing 1.4 million deaths per year. Tobacco is the major preventable cause. However the risk of lung cancer increased by asbestos, arsenic, heavy metal and depleted uranium exposure. Aim of study: In our study we are looking of incidence & main clinical presentation of lung cancer. Patients and Methods: A retrospective study, are deal with 1675 case of Lung cancer were admitted to medical city complex hospitals over period of 10 years (2005-2014). Only 735 cases have been established to have lung cancer by one or more of investigation as: chest x-ray, chest CTscan, sputum cytology, bronchoscope, pleural study, and open lung biopsy. Results: The commonest lung cancer is Squamous cell cancer (40%) is still commonest type, followed by adenocarcinoma (26%), small cell lung cancer (17%) and the large cell Cancer (10%), carcinoid (5%), and anaplastic (2%). The great majority of the patients (90%) of 735 patients were smoker. The average annual incidence is about 100 patient/year. Conclusion: The lung cancer is serious medical problem with increasing incidence annually. The most important risk factor for all cell types carcinoma is smoking (90%). Radio logical appearance it is more in the right side of lung (58.3%).

**Keywords:** Lung Cancer: (LC).Medical city complex-Baghdad (MCC)

## 1. Introduction

A wide variety of lung neoplasms may arise in the lung classified histologically or according to their presumed tissues of origin<sup>(1)</sup>. Lung cancer represents a true epidemic of the 20<sup>th</sup> century. The disease now is the leading cause of cancer-related mortality in men and women in the United States, accounting for 28% of all cancer deaths<sup>(2)</sup>. While in Iraq; it is the commonest in incidence, in men and the 5<sup>th</sup> among women with increasing tendency<sup>(3)</sup>.

It is really our challenge all over the world with great difficulty in treating it because of its earlier metastasis; variable presentations and survival never exceeds 5 years even with early detection and proper treatment<sup>(2,4)</sup>.

So its prevention is our aim especially in controlling its major risk factor -smoking- because it is responsible for more than 90% of lung cancer and linked to all histopathologically cell types.

Our study is focusing on that to face the problem; by revealing the main causative risk factors, enlightening the various measures that be taken for its prevention.

Currently 10 million new lung cancers are diagnosed each year worldwide but unless there is an effective preventive campaign the number will rise to 20 million in 17 years' time, as the report says: because of current level of smoking, unhealthy lifestyle and increasing proportion of elderly people. However tobacco consumption remains the most important avoidable risk factor for lung cancer<sup>(8,11)</sup>.

As noted and expected by Waxman : By the year 2020, an estimated 8.4 million people will die annually from tobacco-related diseases more than two thirds of them in developing countries<sup>(12)</sup>.

On the contrary to the fore mentioned WHO- report; local authorities (National Cancer Centers) pointed to a significant downturn in the incidence of lung cancer in males began in the early 1980s, as in North America, Australia, New Zealand and Europe, especially in USA and UK<sup>(2,13,15)</sup>.

Between 1992 and 1998; incidence rates decreased 2.4% per year<sup>(6)</sup>.

Overall incidence rates of female lung cancer have been stable since 1991 but rates have begun to decline in women under 65 years of age<sup>(2,13,14)</sup> and increase in death rate among women by 55% as in UK<sup>(15)</sup>.

Cigarettes smoking are the most single etiological factor in causation of lung cancer<sup>(2,5,8,17, and 21)</sup>.

The risk being directly proportional to the amount smoked; the tar content of cigarettes and duration of smoking, in addition to the early age of smoking initiation<sup>(5)</sup>.

Data suggest that women smokers may be at increased risk compared to men who smoke. Non-smoking women married to smokers have a 20-30% increased risk of lung cancer<sup>(2)</sup>.

It is important to emphasize that the majority of lung cancers occurring in workers who smoke could be prevented if smoking were eliminated<sup>(2)</sup>.

In addition to smoking there are many well established and suspected carcinogens as well the environmental factors, as the following (Aluminum production, Arsenic, Asbestos, Bis (chloromethyl) ether, Chromium, Coke oven emissions, Iron and Steel founding, Mustard gas, Nickel and its compounds, Radiation and depleted uranium).

Air pollution: Carbon monoxide, Sulfur oxide, hydrocarbons, particulate matter and Nitrogen

Heritable host factors that affect susceptibility or resistance to carcinogens<sup>(2)</sup> which explains the incidence of lung cancer. in some smokers and spares others.

The histological classification for primary lung cancer was originally developed by (The 1999<sup>(24)</sup> WHO pathological classification of lung cancer) which remains the international standard at present time and used by most pathologists and oncologists with minor modifications.

The overwhelming majority of cases are represented by the first four categories; accounting for about 95% of lung cancer, ordered as: Squamous cell carcinoma, Adenocarcinoma. Small cell lung cancer (SCLC). Large cell carcinoma.

In Iraq; lung cancer presented with same order of frequency<sup>(29-35)</sup>. Ordering the lung cancer as adenocarcinoma, Sq., SCLC and large cell carcinoma<sup>(5, 18, 9, 21)</sup>.

The vast majority of patients are symptomatic at the time of presentation and the minority has no respiratory symptoms and the diagnosis has been made by the chance finding of opacity on a chest radiograph that has been ordered for some other reason.

The clinical presentation of lung cancer are often divided into four general categories; according to whether they are related to local manifestations of the tumor (local involvement of the bronchus), invasion of the chest wall or mediastinum, distant blood borne metastasis, or less commonly to non-metastatic Para neoplastic syndromes

Lung cancer can be confirmed only cytological or histologically in any suspected symptomatic or asymptomatic patient, while other techniques are utilized for staging rather than for typing. Sputum cytology is up to 98% reliable for malignancy<sup>(2)</sup>. The optimal results are usually obtained from samples collected on 5 consecutive days especially the early morning sample. Fibro-optic bronchoscope is more useful for central than peripherally located lesions which are not accessible<sup>(2)</sup>. Bronchoscope permits washing, brushing, end bronchial biopsy and trans bronchial biopsy (for per bronchial lesion). Trans thoracic fine needle aspiration is utilized for peripheral lesion-not accessible by bronchoscope<sup>(2, 39, 42)</sup>.

Pleural aspiration and/or biopsy confined only to lung cancer associated with pleural effusion and may be helpful for diagnostic purposes<sup>(21)</sup>. The analysis of pleural effusion will provide the diagnosis of malignancy more often than pleural biopsy. With a positive yield varies from 40-80% of cytological accuracy<sup>(21)</sup>. Lymph node biopsy: Video-

assisted thoraces copy, Thoracotomy, Mediastinoscopy, Metastatic biopsy, Tumor markers,

Other investigations which can be used for staging rather than for typing the diseases: Chest CT: Spiral CT: MRI: Positron- emission tomography- PET: Lung- imaging.

### Aims of the study

The aims of this study are:-

- 1) To show incidence of lung cancer in Medical City Complex in last 10 year.
- 2) To follow up the behavior of this type of cancer in Medical city complex.
- 3) To compare results with the results of the previous studies conducted in our country.

### Patients and Methods

A retrospective study is carried out on records of 10000 patients admitted to the Medical City Complex hospitals: (Baghdad Teaching Hospital, The Hospital of Specialized Surgery, and Nursing Home Hospital). Over a period of ten years; (January, 2005 to December, 2014). Including different diagnoses as patient's notes contains one of the following diagnoses "labels": (Pulmonary nodule shadow, Pleural effusion, Lung cavity and Lung tumor.

Out of **1675** cases diagnosed as lung cancer: only **1240** patients (**74%**) were confirmed cytological and/or histological. The remaining **435** patients (**26%**) who were diagnosed clinically, radiological or both but without cytological and/or histological confirmation were excluded.

The study is conducted at the Medical City complex as it presents a fairly representative picture of the disease in Iraq as it is one of the major referral centers of such cases from various parts of the country.

In addition to the history, clinical examination and chest x-ray. This study reports the findings in the **1240** patients in whom the diagnosis of lung cancer has been established by one of the following investigations. Some patients were investigated by more than one technique: Sputum cytology. Bronchoscope: wash, brush and biopsy, Pleural fluid cytology and/or biopsy and Open-lung biopsy (thoracotomy).

All of these patients were reviewed according to the patient's data as shown in this study.

## 2. Results

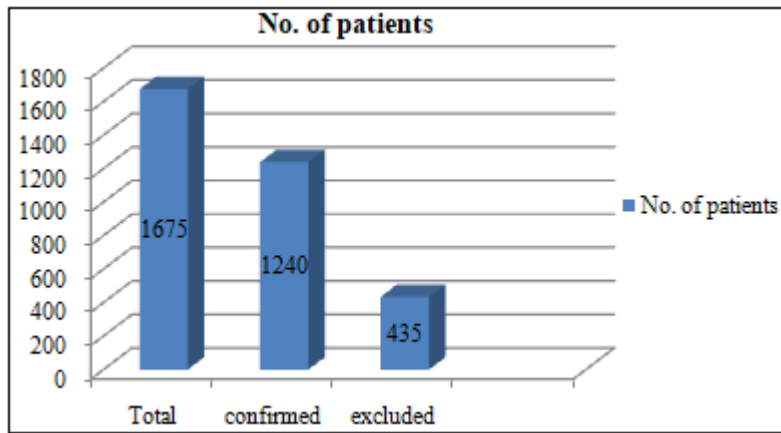


Figure 1: Distribution of LUNG CANCER cases Confirmed & excluded (without confirmation)

Address as shown 511 patients (41.2%) were from Baghdad while the rest 729 patients (58.8%) were from the other Iraqi governorates.

The age of the patients ranged between (25-85) years about 72% with mean age 55 years, and maximum incidence (473 patients- 65%) are between (50-69) years.

Gender male- 932 patients (75.2%) more than female- 308 patients (24.8%) with M: F. ratio 3: 1.

Smoking is the prevalence in the total (1116 patients) 90%. Three quarters of them (831 patients) were heavy smokers. Duration of smoking was 10-40 years. More prevalent in male- 882 patients (94.7%) than female- 206 patients (70.3%).

Annual Incidence of lung cancer at 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014 as 35, 65, 80, 95, 104, 115, 151, 160, 173, 262 Patients respectively.

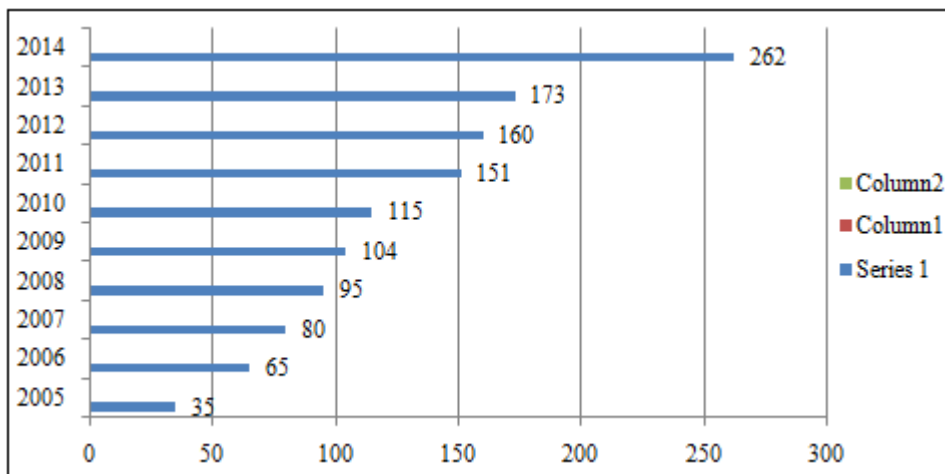


Figure 2: Distribution of LUNG CANCER cases in as a total

The chest x-ray finding is shown in figure (3). It is normal in 75 patients (5%) while the other 1165 patients (95%) are abnormal. Hilar shadow 13 (1%). Bilateral shadow 56

(4.6%). Right lung 696 patients (56.8%). Left lung shadows are 400 (32.6%). As shown lung cancer predilection is more in right lung than left.

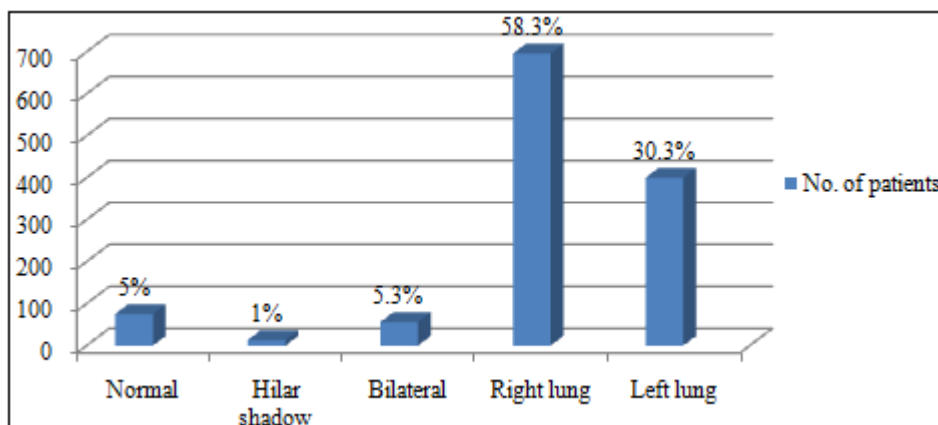
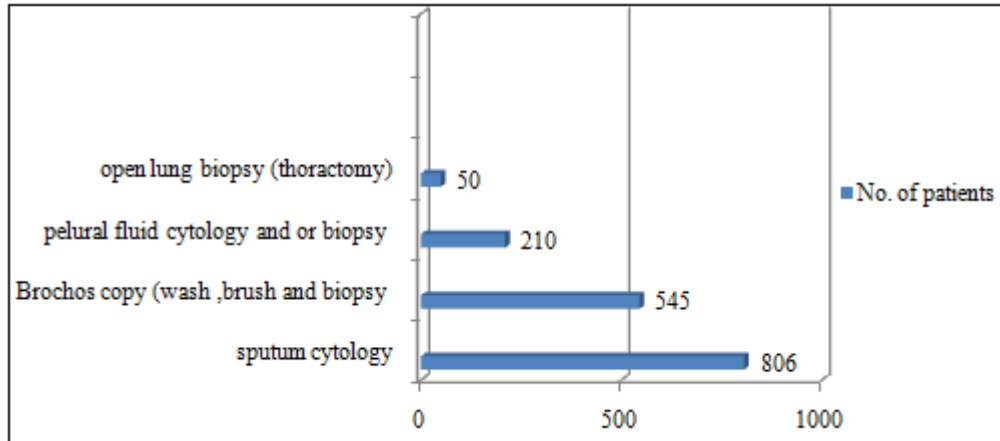


Figure 3: Distribution of L.C according to radiological (chest X-ray) Findings

The diagnosis of our 1240 cases was established cytological and/or histologically by different methods of investigations utilized as shown in figure (4); as the following:

- 1) Sputum cytology: **806 patients (65%)** – 628 patients from 806 patients have(78%) positive sputum.
- 2) Bronchoscope: wash, brush and biopsy (combined): **545 (44%)** - 468 (86%) positive.
- 3) Pleural fluid cytology and/or biopsy: **210 (17%)** - 160 (76%) positive.
- 4) Open-lung biopsy (thoracotomy): **50 patients (4%)** -50 (100%) positive.

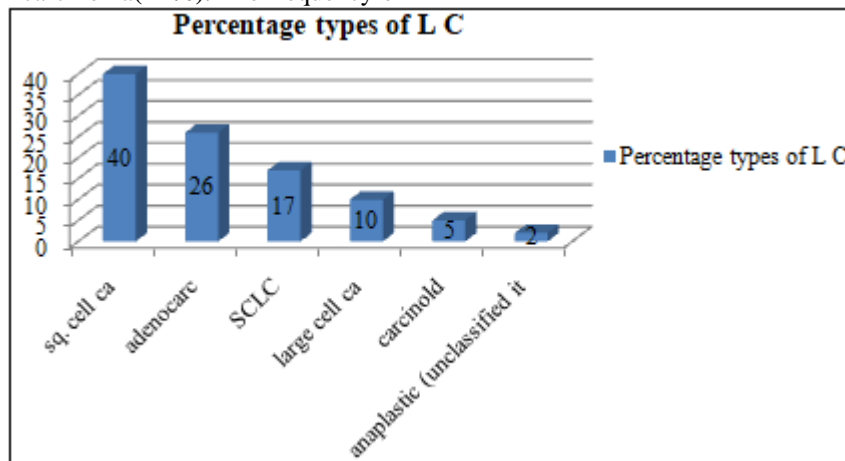


**Figure 4:** Diagnostic method utilized in Lung Cancer

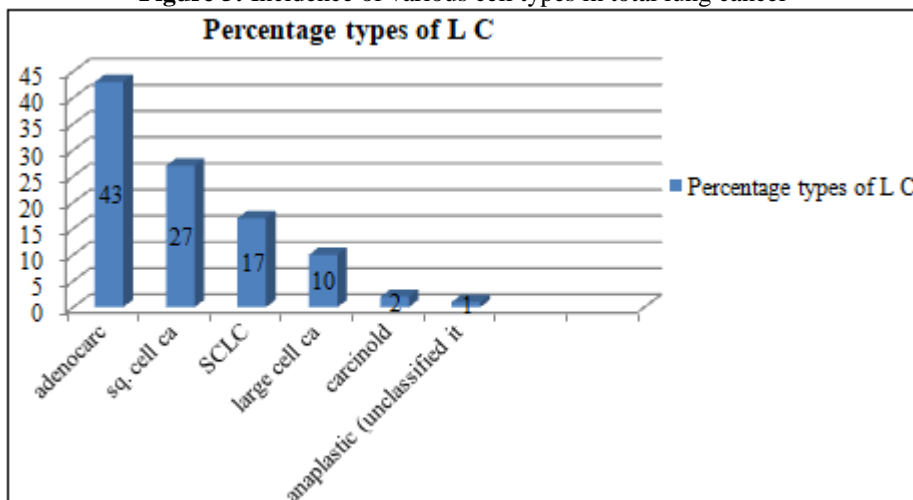
The most common cell type of lung cancer are squamous cell carcinoma (40%) followed by adenocarcinoma (26%),small cell lung cancer SCLC (17%) and large cell cancer(10%).While in women, adenocarcinoma. (43.2%) surpassed squamous cell carcinoma(27%). The frequency of

incidence for each cell type is figure (5, 6). shown in figure (10, 11).

Figure Incidence of various cell types in total cases.



**Figure 5:** Incidence of various cell types in total lung cancer



**Figure 6:** Incidence of various cell types in total lung cancer in female

### 3. Discussion

The average annual incidence is **124 case/year**; and this result is more than the other Al-Alusi's two studies about 82<sup>(30)</sup> and about 81<sup>(31)</sup> respectively; which means that lung cancer is in increasing incidence in our country.

Out of **1240** patients in this series **508 patients (41.2%)** were from Baghdad and **732 patients (58.8%)** were referred from the rest of the Iraqi governorates.

So the data presented are likely to be fairly representative of lung cancer in Iraq. With same results obtained by Al-Azzawi M.M: studies<sup>(32)</sup>, **40%**, from Baghdad.

The mean age of patients studied is **55** years. The peak incidence is in the age group years. This is comparable to previous four studies conducted in Iraq<sup>(30, 31, 32, and 33)</sup>.

The Male to female. Ratio is **3:1**. This result is identical to the Iraqi Cancer Registry Center result 3:1<sup>(67)</sup>. Indicating drastic rise of lung cancer in Iraqi women due to increment in their tobacco smoking consumption.

Our result revealed that 90% were smokers for an average of 25 years of smoking duration. Three quarters of them are heavy smokers (more than three pack/day). The prevalence of smoking is more in males (**94.7%**) than females (**70.3%**). This result is comparable to Al-Alusi's three study's findings 88.8%. 90% and 89.34% with 75%. 66.6% of who were heavy smokers<sup>(30, 32)</sup>.

American Thoracic Society/ European Respiratory Society comment that; smoking accounts for 80-90% of all cases of lung cancer and it is easier to prevent than cure<sup>(38)</sup>. And this confirms our result.

Chest X-ray remains the cornerstone of lung cancer detection and diagnosis. However **5%** of our patients were with normal chest X-ray. This result confirmed by many textbook and studies<sup>(2, 11, and 25)</sup>. The **95%** of chest X-ray finding were abnormal. About two thirds were in the right lung and **5.3%** were bilateral.

The diagnostic methods were utilized in the hospitals where patients were studied.

Sputum Cytology the positive result is **78%** of the **628** patients underwent sputum cytology examination. Many studies were conducted in Iraq with variable results, **33.7%, 38, 50, 54, 73 and 83%**<sup>(29, 33, and 35)</sup>.

Bronchoscopy: Including wash, brush and biopsy. It was positive in **86%** of the 468 patients. This result is comparable with Al-Alusi findings<sup>(30, 31)</sup> 80%. In general, the sensitivity of bronchoscope for detecting a malignant process ranges from 20-80%<sup>(39)</sup>.

Pleural fluid cytology and/or biopsy this procedure was utilized in **210** patients (**17% of all**); **160** of them (**76%**) were positive which is identical to results of two Iraqi studies<sup>(29,30)</sup>.

Open-lung biopsy (thoracotomy) it is the gold standard for determining the final grading status of the cancer and permits decision to be made regarding the surgical procedure required. **20** patients were underwent thoracotomy and open-lung biopsy examined with **100%** positive yield which comparable to Ahmed results<sup>(35)</sup>.

Histological cell type of lung cancer: Squamous cell carcinoma. (**40%**) is still the commonest cell type followed by adenocarcinoma (**26%**), SCLC (**17%**) and large cell CA. (**10%**). While the rare types are; in order of frequency: carcinoid **5%** Ana plastic (unclassified) **2%**.

This result is compared well with the old and new Iraqi studies and more or less similar to many world studies and textbooks<sup>(1, 3, 11, 17, 21, 25, 26, 31, 35, and 67)</sup>. This confirms the strong association of its incidence with smoking consumption which was supported by Al-Alusi<sup>(30)</sup> and Strauss<sup>(21)</sup>.

Small cell carcinoma is the third one in order of frequency; was identified in **210 patients (17%)**. In agreement with the results of Abdul-hammed study<sup>(34)</sup>.

Other rare types are Carcinoid tumors were seen in **37 patients (3%)** younger age and predominantly in males (**8:1**). Our result is roughly similar to result in England and El-Hassani<sup>(70)</sup>.

Anaplastic- unclassified- are **13** patients only (**1%**) with M: F ratio 5:1.

### 4. Conclusion

- Lung cancer is a serious medical problem with increasing incidence annually in men and women.
- The peak incidence is 50-69 age groups with mean age 55 years and M: F/ 3:1.
- The most important risk factor in lung cancer incidence for all cell types is smoking (90%).
- Radio logically; it is more in the right lung.
- More patients subjected to bronchoscopic examination, but FNA and open lung biopsy are the best diagnostic method.
- The commonest type is squamous cell carcinoma. Followed by adenocarcinoma, which surpassed squamous cell carcinoma in women?

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