

Histopathological types of primary lung cancer at Medical City Complex in Baghdad over four-year interval: A Retrospective study

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ABSTRACT

INTRODUCTION: Bronchogenic carcinoma represents a true epidemic of the 20th century. Now, the disease is the leading cause of cancer related mortality in both men and women. It involves people in middle age groups leading to loss of man power at early age. The main recognized cause is cigarette smoking so it is one of the preventable cancer once this habit has been controlled.

OBJECTIVE: This retrospective study is designed to exam histopathological types of primary lung cancers in patients at Medical City Complex and to describe some of their demographic factors.

METHODS: This is a retrospective, record based, study that was conducted at histopathological department in Medical City Complex in Baghdad in 2013 to review the records over four years from January, 1, 2009 to December, 31, 2012. We enrolled all cases who diagnosed as primary lung cancers in histopathological department over the studied period. The diagnosis was made by senior histopathologists by cytological and histopathological examination. Data extracted from files by the authors which included demographic and histopathological features.

RESULTS: The study showed that the average diagnosis of primary lung cancer is 101.25 patients per a year. The peak age groups involved were the middle and old age group 40 years and more. Lung cancer was more in men 282 patients (69.6%) than in women 123 patients (30.4%) with men to women ratio 2.3:1. The majority of patients were smokers 255 patients (62.9%), and men smokers were predominant (82.7%). Adenocarcinoma is the commonest cell type in both genders (166, 41%) followed by squamous cell carcinoma (115, 28.4%) followed by small cell carcinoma (46, 11.4%).

CONCLUSION: Lung cancer is more in middle and old age groups, and predominantly in men. Adenocarcinoma is the commonest histopathologic type in our sample followed by squamous cell carcinoma.

Key words: Primary lung cancer, Bronchogenic carcinoma, adenocarcinoma, Histopathology of primary lung cancer.

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INTRODUCTION

In the United States, lung cancer now accounts for about 32% of all cancer deaths in men and 25% in women followed by prostate cancer (14%) and breast cancer (17%) for men and women respectively. Its incidence accounts for 15% of estimated newly diagnoses of cancer among men and 13% among women ranking it as the second cancer in incidence; next to prostate cancer in men and to breast cancer in women.^{1, 2, 3, 4, 5} As expected by the reports of the World Health Organization (WHO), a worldwide cancer rates are set to double by 2020.³

The large majority, up to 90 %, of lung cancer is caused by cigarette smoking, several other factors have been implicated, although none to

the extent of tobacco.^{2, 6-8}

Lung cancer is rare below age of 40 years with increasing rates until age of 80 years; thereafter, the rate tapers off.²

The incidence of lung cancer varies by racial and ethnic groups, with the highest incidence among African American.² Women who smokes have more risk of lung cancer than men who smokes, and non smoker women married to smokers have 20–30 % increase risk of lung cancer, while long term passive smoking increase the risk by 1.5 fold. Cigarette smoking is the most dominant cause for lung cancer in (85–90%) of cases, active smoking increase risk of all the major lung cancer cell types by greater than 10 folds, long term passive smoking increase

the risk by 1.5 fold.^{1, 2, 6, 9-13}

Epithelial lung cancer originate from respiratory epithelium of bronchi, bronchioles and alveoli and according to the WHO classification these epithelial lung cancers are consisting of four major cell types:

- * Small cell lung cancer (SCLC)
 - * Non-small cell lung cancer (NSCLC) which include:-
1. Squamous cell carcinoma.
 2. Adenocarcinoma.
 3. Large cell carcinoma.

These four major cell types account for 90% of epithelial lung cancers while the remainder include undifferentiated carcinomas, carcinoids, and bronchial gland tumors which include adenoid cystic and mucoepidermoid tumors. Epithelial lung cancer may occur histopathologically as single or mixed type, the most common histological types that occur with smoking are squamous and small cell carcinoma while adenocarcinoma occur more commonly in non smokers, young and in women.^{2, 10}

This study will define the histological types of primary lung cancer diagnosed at histopathological department in Medical City complex in Baghdad, Iraq for the last four years.

METHODS

Setting of the study: This study was conducted in histopathological department in Medical City Complex in Baghdad, Iraq in 2013. It has been based on reviewing the medical records of all patients diagnosed as lung cancer over the period of four years from first of January 2009 to thirty first of December 2012. Medical City Complex is the biggest medical and teaching centre in Iraq, and it receives patients from Baghdad and other Iraqi provinces.

Definition of case: on reviewing the records at the histopathological department, any patient who had been diagnosed as any type of lung cancer was included in this study. Diagnosis of lung cancer was made by senior histopathologists working in the department. They were not informed at time of examination about the aim of the study and they do follow the international diagnostic criteria of lung cancer which is adopted by their department.

Inclusion and exclusion criteria: We enrolled all cases who fulfilled the diagnostic criteria in this study no one was excluded from the study.

Team of the study: in addition to the author and the scientific supervisor, the team has included a statistician advisor and senior histopathologist whom collectively has designed the extracting form. This form has included two parts, the first included demographic features of the patients like age, gender, and smoking habit. The second has included the histopathological features of the tumours.

Procedure: The authors has examined all the records and extracted the data according to the form agreed upon. We divided the patients into 8 categories according to the histopathological types of the tumour:

1. Small cell carcinoma.
2. Squamous cell carcinoma.
3. Adenocarcinoma.
4. Large cell carcinoma.
5. Adenosquamous cell carcinoma.
6. Poorly differentiated carcinoma.
7. Bronchoalveolar cell carcinoma.
8. Others: in which the diagnosis was carcinoma in situ, carcinoid or mesothelioma and fibroma.

Patients aged 39 years or less were categorized as young group and those between 40-60 years as middle age group and those aged 61 years or more as old age group.

Statistics: data were tabulated by excel sheet and expressed by tables and percentages.

RESULTS

Table 1 shows some demographic features of the patients including age gender and smoking habit. About 92 % of the patients were over the age of 40 years. Number of men who developed carcinoma of the lung outweigh that of women; 282 patients (69.6%) and 123 patients (30.4%) respectively. Two hundred fifty-five patients (62.9%) were smokers, while 150 patients (37.1%) were not smokers. Smoking is more prevalent in male than in female, 211 patients (82.7%) versus 44 patients (17.3%).

Table 2 shows the rate of diagnosis of carcinoma of the lungs in medical city. Twenty-seven

Table 1: demographic factors of primary lung cancer.

Demographic Characteristics	No.	%
Age (year)	< 40	34
	40 – 60	176
	>60	195
Gender	Man	282
	Women	123
Smoking	Smokers	255
	Nonsmokers	150
Total number of patients	405	100

Table 2: Number of lung cancer per a year.

The year	Number	%
2009	27	6.6
2010	77	19
2011	111	27.4
2012	190	47
Total	405	100

Table 3: Distribution of primary lung cancer cases according to the histological cell type.

Histopathology	NO.	%
Squamous Cell Carcinoma	115	28.4
Small Cell Carcinoma	46	11.4
Adenocarcinoma	166	41
Large Cell Carcinoma	15	3.7
Unclassified Carcinoma	22	5.4
Adenosquamous Cell Carcinoma	5	1.2
Bronchoalveolar Cell Carcinoma	4	0.9
Others	32	8
Total	405	100

patients (6.6%) were recorded in 2009, 77 patients (19%) in 2010, 111 patients (27.4%) in 2011, and 190 patients (47%) in 2012.

Table 3 shows the types of histopathology of carcinoma of lungs. Adenocarcinoma is the commonest type 166 (40%), while Bronchoalveolar Cell Carcinoma is the least common 4 (0.9%).

DISCUSSION

Bronchogenic carcinoma is a common disease in middle age and elderly people. We reported in our study that about 92 % of the patient were older or equal to 40 years. The commonest percentage of patients were seen in those over 60 years. These results are com-

parable to Al – Khafajy's study¹⁴ (50 – 69) years, Al-Alusis's studies^{15, 16} Abdullah's study¹⁷ and Al-Qassir's study.¹⁸

We found that men predominate women in a ratio of 2.3:1, which is nearly close to 3:1 which is reported by the Iraqi Cancer Registry.¹⁹ Al-Alusi¹⁶ and El-Hassani²⁰ have come to closer results, 2.5:1 and 2.75:1 respectively; however, other studies^{18,21-23} have come to higher ratio ranging from 4:1 to 9:1. This might indicate that the lung cancer in Iraqi women is increasing over years. Increasing smoking habit among women and increasing their exposure to different risk factors due to their more participation in civilized life can explain this relative raise in incidence of lung cancer among Iraqi women.

In our series, about two thirds of patients with bronchogenic carcinoma were smokers; a result that is similar to Al-Timimi²⁴ who shows that 67 % of his sample with bronchogenic carcinoma are smokers. But in comparison to many other Iraqi studies^{14-16,23,25} that showed that up to 90 % of patients with bronchogenic carcinoma are smokers. In addition to the effect of defining the target of each study and its selection criteria on such a result, we should think of changing trends in the causation of cancer of lung, in our community, from depending mainly on smoking to the emergence of other environmental factors. Although smoking habit among women in Iraq is changing nowadays, Smoking is still more relevant among men than in women. In our study, 211 patients who smoke (82.7 %) were men while only 44 (17.3%) patients who smoke were women. This is consistent with the conservative style of our community in restricting or forbidding smoking among women, and at the same time explaining the higher incidence of cancer of lungs among men.

The average rate of diagnosis of bronchogenic carcinoma in our sample of the study is 101.25 case per a year, and this is comparable to Al-Khafajy's study¹⁴ that reported 100 case per a year and Alusi's study that reported 103 cases per a year. But it is more than what was reported by another study.¹⁵ The lowest rate of diagnosis was in 2009 and the highest was in 2012. This rise in the rate of diagnosis might be attributed to the improvement in health care provided in our hospitals and improvement in detection of cancers. Increase incidence of cancer of lungs in our community cannot be ignored as a cause for increasing rate of detection. In order to identify which is the main cause for this rise, another na-

tionwide based cohort study is needed.

Table 3 shows that adenocarcinoma is the most common cell type (41%) in our study, and followed by squamous cell carcinoma (28.4%). While bronchoalveolar cell carcinoma (0.9%) was the least cell type diagnosed in this series. Our results are similar to many studies from the USA^{2,3,5,10,26} which have shown that adenocarcinoma is the commonest cell type, while most other Iraqi studies, old and new, have shown that squamous cell carcinoma is the commonest cell type of lung cancers.^{14,15,22,24,27-31}

Small cell carcinoma is the third histological cell type in order of frequency affect 29 male and 17 female is comparable with that of Al-Tamimi²⁴ and Al-Khafajy.¹⁴

In our study adenocarcinoma is the most common cell type in both male and female 112 and 54 patients respectively than squamous cell carcinoma 88 male and 27 female patients, this is probably because of higher percentage of smoking in young patients and the longer smoking exposure time required to develop squamous cell carcinoma.

Therty-two (8%) patients have no specific histological cell type like carcinoma in situ, or lung carcinoma; some have non-epithelial cell origin like fibroma and sarcoma, and others have neuroendocrine cell origin like carcinoid.

Conclusion

Lung cancer is more in middle and old age groups, and predominantly in men. Although smoking is the leading cause for development of cancer of lungs other environmental factors cannot be ignored. Pathological shift from squamous cell carcinoma to adenocarcinoma has been noticed a trend which is similar to western style.

The peak incidence is in the middle and old age group and the male to female ratio is 2.3:1., and cigarette smoking is a major risk factor in both genders, the most common cell type in both male and female is adenocarcinoma.

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Abbreviation list: Non-small cell lung cancer (**NSCLC**), Small cell lung cancer (**SCLC**), World Health Organization (**WHO**)

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