

LUNG CANCER IN A SAMPLE OF IRAQI PATIENTS⁺

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Abstract.

Lung cancer is responsible for the most cancer deaths in both men and women throughout the world. Deaths from lung cancer (160,440 in 2004, according to the National Cancer Institute) exceed the number of deaths from four other major cancers combined (breast, colon, pancreatic and prostate). This descriptive retrospective study was performed using the records of 390 patients proved to have lung cancer aiming to assess the behavior and the approaches of lung cancer in a sample of Iraqi patients.

The results of this study reveal that 71.8% of the patients were male, with a mean age of 63 years. The majority of the patients (90.2%) were smokers, the number of cases increases with the increase in the duration of smoking or the amount of daily cigarette smoking. Cough is the most common clinical findings, found in 98.5% of patients, followed by haemoptysis (64.1%). Chest x-ray, sputum cytology, bronchoscope and computerized tomography (CT)-scan are the back bone in the diagnosis in the majority of the cases. Chemotherapy and/or radiotherapy are the primary management of 75.9% and the surgical choice was in 24.1% of the patients, but the tumors were removed only in 42.5% of operable patients.

المستخلص:

خلفية الدراسة. يعد سرطان الرئة من الامراض الخطيرة التي ازداد نسبة حدوثها في الاعوام السابقة بصورة ملحوظة في جميع انحاء العالم نتيجة تفشي ظاهرة التدخين بين افراد المجتمع و بعضهم النساء.

هدف الدراسة. التعرف على عوامل الخطورة ، طريقة الظهور، نتائج التحاليل الطبية و الخطوات المتبعة في العلاج لمرض سرطان الرئة في عينة من المرضى العراقيين.

طريقة الدراسة. تمت دراسة الوثائق الطبية لـ ٣٩٠ مريضاً مصابين بمرض سرطان الرئة (تم التشخيص بواسطة التحليل النسيجي) من الذين يراجعون قسم جراحة الصدر في مستشفى الجراحات التخصصية / بغداد. تم تحليل توزيعهم الديموغرافي، الاعراض السريرية، نتائج التحاليل وطريقة العلاج لهؤلاء المرضى.

نتائج الدراسة. نسبة المرض عند الذكور الى الاناث بلغت ٢,٥ : ١ معدل العمر ٦٢ سنة ، نسبة المدخنين ٩٠,٢ % ، السعال موجود عند ٩٨,٥ % من المرضى. اشعة الصدر كانت غير طبيعية في ٩٧,٤ % ، تحليل خلايا البلغم اكد تشخيص ٥٩,٣ % من المرضى الذين اجري لهم، الناظور القصبي اجري لـ ٨٣,٦ % و كان ايجابيا في ٦٣,٢ % ، اجري المفراس الحزوني و السرني لـ ٨٩,٢ % . لم يتم

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تشخيص المرض في ٥,٦% من المرضى الا بعد اجراء التداخل الجراحي. معظم المرضى (٧٥,٩%) عولجوا بواسطة العلاج الكيميائي و الاشعاعي و كان التداخل الجراحي في ٢٤,١% فقط. اكدت الدراسة اهمية الوقاية من المرض و ذلك بالتوقف عن التدخين الذي هو السبب الرئيسي للمرض في حوالي ٩٠% من المرضى.

Introduction

Lung cancer or bronchogenic carcinoma ("carcinoma" is another term for cancer), is a term to define the malignant tumors which arise from the respiratory epithelium, and comprise of more than 90% of all primary lung tumors [1]. It is the most malignant tumor in man and the second (after the breast cancer) in women. It is estimated that 10 million new lung cancer cases are diagnosed each year worldwide [2].

In Iraq, lung cancer is the most commonly occurring cancer in men (16.7%) and the fifth in women (4.2%) for the period of 1995-1999 [3].

Cigarette smoking is by far the most important single factor in the causation of lung cancer; it is directly proportional 90% of lung carcinomas. The risk being proportional to the amount smoked, the tar content of the cigarette, and the duration of the smoking [4]. The relative risk of developing cancer is increased about 12 folds by active smoking and 1.5 fold by long term passive exposure to cigarette smoke [5]. Exposure to naturally occurring radon has been estimated to cause 5% of lung cancer. The incidence of lung cancer is also slightly higher in urban than in rural dwellers, this may reflect differences in atmospheric pollution (including tobacco smoking) or occupation since the number of industrial products (e.g., asbestos, beryllium, cadmium, and chromium) are associated with lung cancer[6].

The common cell types are squamous cell carcinoma (35%), adenocarcinoma (30%), small cell carcinoma (20%), and large cell carcinoma (15%). These histological types have an important bearing on the clinical presentation, prognosis, and response to treatment [6].

The majority of the tumor arising in the main bronchus or in one of its primary or secondary divisions. They produce bronchial irritation and ulceration at early stage and frequently give rise into bronchial obstruction and the patient with carcinoma of the lung present most commonly with symptoms reflect local involvement of the bronchus such as cough, haemoptysis, breathlessness, but the symptoms may also arise from the spread to the chest wall or mediastinum, from distant blood borne, or less commonly as the result of a variety of non-metastatic para-neoplastic syndrome [7].

The main aims of investigation are to confirm the diagnosis, establish the histological cell type, and define the extent of the disease. Several diagnostic tools have been used but chest x-ray, sputum cytology, bronchoscope, and recently Computerized Tomography (CT)-scan & Magnetic Resonance Imaging (MRI) are the most useful to reach the diagnosis in majority of cases [8].

The best way of management can be only achieved by early diagnosis and surgical resection, but unfortunately majority of cases (85%) is not operable at time of diagnosis. Chemotherapy, radiotherapy, laser therapy, and recently immunotherapy are the alternative types of management [9]. The overall prognoses in lung cancer is very poor with around 80% of patients dying within a year of diagnosis, and less than 5% of patients surviving 5 years after diagnosis [10].

The purpose of this study is to assess the clinical presentation, investigation, and line of treatment of lung cancer in a sample of Iraqi patients.

Patients and Methods

This descriptive retrospective study was performed using the records of 390 patients with lung cancer (proved by histo-pathological examination) that had attended the Thoracic Surgery Department, of Surgical Specialties Hospital- Medical City/ Baghdad for the period from January, 1st, 2001 to December 31st, 2002. This Department is the major thoracic surgical center in Iraq; it's the referral center for the majority of lung cancer cases from other hospitals all over Iraqi governorates.

The results of clinical presentation, investigation, and management were obtained from their case records; organization, summarization and statistical analysis of the data were done by using descriptive statistics (frequency and percentages).

Results

The results of this study were based on the analysis of 390 case-records for patients who had proven to have lung cancer.

A- Sex distribution.

The majority of the patients (71.8%) were male with male: female ratio 2.5: 1, as shown in Table 1.

Table 1: Sex distribution of the study sample.

Sex	No.	%
Male	280	71.8
Female	110	28.2
Total	390	100

B- Age distribution.

The age of the patients ranged between 35-89 years with a mean of 63 years, 83.6% of the patients were 50 years old or above as shown in Table 2.

Table 2: Age distribution of the study sample.

Age groups (years)	No.	%
30-39	22	5.6
40-49	42	10.8
50-59	108	27.7
60-69	144	36.9
70-79	46	11.8
80-89	28	7.2
Total	390	100

C- The residence.

The distribution of the study sample regarding their residence is nearly equal as shown in Table 3.

Table 3: The distribution of the study sample regarding their residence.

Residence	No.	%
Urban	198	50.8
Rural	192	49.2
Total	390	100

D- Smoking habit.

This habit was found in the majority of the patients (90.2%), while only 3.1% never smoked. The number of cases increases with the increase in the duration of smoking (78.8%) of smokers and ex-smokers patients smoked for more than 10 years) or the amount of daily cigarette smoking (89.4% of smokers and ex-smokers patients smoked more than 10 cigarettes per day) as shown in Tables 4 & 5.

Table 4: The distribution of the smokers and ex-smokers regarding the duration of the smoking habit.

Smoking habit	Duration (years)	No.	%
Smokers n = 352 (90.2%)	<5	10	2.6
	5-10	64	16.9
	11-15	92	24.3
	>15	186	49.2
Ex-smokers n = 26 (6.7%)	<5	2	0.6
	5-10	4	1.1
	11-15	4	1.1
	>15	16	4.2
Total		378	100

Table 5: The distribution of the smokers and ex-smokers regarding the daily amount of cigarette smoking.

Cig. Per day	No.	%
<5	8	2.1
5-10	32	8.5
11-20	146	38.6
>20	192	50.8
Total	378	100

E- Clinical findings.

Cough is the most common clinical finding, found in 98.5% of patients, this findings is shown in Table 6.

Table 6: The distribution of the study sample by their main clinical findings.

Clinical findings (n = 390)	No.	%
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Cough	348	98.5
Haemoptysis	250	64.1
Dyspnea	188	48.2
Chest pain	80	20.5

F-Investigation;

- 1- Chest X-ray; the results of postero-anterior and lateral views were abnormal in 97.4% of patients. The cancer was located 44.3% in the upper lobes of the right lung and in 30.2% of the left. The cancer is more in the upper than lower lobes with a ratio of 2.9:1. The main chest x-ray findings were showed in Table 7.

Table 7: The main Chest X-ray findings of the study sample.

Findings	No.	%
Hilar shadow	58	4.9
Pulmonary shadow	212	54.3
Pleural effusion	66	16.9
Lung cavity	40	10.3
No abnormal findings	14	3.6
Total	390	100

- 2- Sputum cytology; was done to 310 patients (79.5%) with positive results in 184 patients (59.3%) and it was sequamous cell carcinoma in 80% of the positive findings.
- 3- Pleural fluid cytology; was don to 76 patients (19.5%) with positive results in 50 patients (65.8%).
- 4- Lymph node biopsy; was done in patients with palpable cervical lymph nodes, they were 76 patients with 90% positive results. It was small cell carcinoma in 75% of patients.
- 5- Trans-thoracic fine needle aspiration; was done in 84 patients with peripheral carcinomas, with positive results in 62 patients (73.8%).
- 6- Bronchoscope; was done in 326(83.6%) patients (who were fit for the procedure) and revealed abnormalities in 206 patients (63.2%) as shown in Table 8.

Table 8: Bronchoscope findings of 326 patients with carcinoma of the lung.

Bronchoscope findings	No.	%
Vocal cord paralysis	30	9.2
Involvement of the trachea	26	7.8
Tumor deposit on carina	58	17.8
Involvement of the main bronchus	82	25.3
Mucosal congestion of the trachea and/or bronchial tree	10	3.1
No abnormality	120	36.8
Total	326	100

- 7- CT-scan and/or MRI findings; were done to 348 patients (89.2%) either each alone or in combination and they revealed the results that shown in table 9.

- 8- Open lung biopsy; was done in only 22 patients (5.6%) when the above investigations failed to reach the diagnosis. The histo-pathological results revealed carcinoma in 100% Of the patients.

G- Management.

Chemo-therapy and/ or radiotherapy were used in 296 patients (75.9%), while surgery was the decision in 94(24.1%) patients, unfortunately, only 42.5 %(40 cases) of operable patients were found to be resectable.

H- Histo-pathological results.

This revealed that the sequamous cell carcinoma is the most common type in Iraq , it was found in 166 patients(42.6%), followed by adenocarcinoma in 108 patients (27.7%), followed by small cell carcinoma in 58 Patients (14.9%), then large cell carcinoma in 38 patients (9.7%). The diagnosis in the reminder 20 patients was anaplastic tumor in 8 patients, adenosequamous tumor in 8 patients and carcinoid in 4 patients. The distribution of the histological types regarding the sex is shown in Table 10.

Table 9: CT-scan and/or MRI findings of 348 patients with carcinoma of the lung.

CT-scan and/or MRI findings	No.	%
Tumor size less than 3 cm, confined to a lobe;		
- without *LN involvement.	14	4.0
- with hilar LN involvement.	8	2.3
- with mediastinal LN involvement.	18	5.2
Tumor size more than 3 cm invading visceral pleura, extend to the hilum;		
- without LN involvement.	4	1.1
- with hilar LN involvement.	14	4.0
- with mediastinal LN involvement.	32	9.2
- with subcarinal LN involvement.	38	10.9
Tumor extends to chest wall, mediastinum, pleura or pericardium;		
- with hilar LN involvement.	48	13.8
- with subcarinal LN involvement.	36	10.4
Tumor invades heart, great vessels, oesophagus, or vertebral bodies;		
- with mediastinal LN involvement.	36	10.4
- with satellate deposition.	34	9.8
- with malignant pleural effusion	28	8.0
Tumor invades brain or abdominal organs	38	10.9
Total	348	100

*LN = lymph node.

Table 10: The distribution of the histological types regarding the sex of the study sample.

Tumor's type	Male (%)	Female (%)	Total
sequamous cell carcinoma	126 (75.9)	40 (24.1)	166
Adenocarcinoma	54 (50)	54 (50)	108
Small cell carcinoma	46 (79.3)	12 (20.7)	58
Large cell carcinoma	36 (94.7)	2 (5.3)	38
Anaplastic tumor	8 (100)	0 (0)	8
Adenosequamous	6 (75)	2 (25)	8
Carcinoid	4 (100)	0 (0)	4
Total	280 (71.8)	110 (28.2)	390

Discussion

The perceived impression about cancer being predominantly a disease of developed and affluent societies is a common misconception. In 1994, over half of the annual world total of 5.8 million new cancer cases was reported from developing countries [5]. Primary carcinoma of the lung is a major health problem with a generally grim prognosis. However, an orderly approach to diagnosis and management based on proper knowledge of the clinical behavior of the lung cancer combined with a critical review of prevention and clinical treatment trials allows selection of the best steps in prevention and management [6]. This approach should be multidisciplinary, involving the interaction of medical internists, or chest physicians, thoracic surgeons, radiation oncologists, pathologists, as well as the epidemiologists. [10].

In order to study the clinical behavior of lung cancer in Iraq, we have select 390 records of those patients proved to have this disease histo-pathologically. The male: female ratio of the study sample is 2.5:1; this result is close to the result of Iraqi cancer registry center (2.9:1), and to other Iraqi studies conducted by El-hassani [11], Al-alusi [12], Al-Kafaji [13] and Al-Qassir [14]. This result is also identical to other Asian countries as in China 2.6:1, Japan 2.8:1, and Korea 3:1[15], but differs from the Western countries as in USA 2:1, and England 1.8:1. [16].On the other hand, El-hassani in 1987 found the ratio was 9:1 [17], this mean a dramatic increase in the incidence and prevalence of lung cancer among Iraqi women mostly due to the invasion of smoking habit into female gender. The increment in the incidence and the prevalence have also occurred in men as lung cancer was the second most common cancer (11.9%) after bladder cancer(13.1%)in Iraqi male for the period 1980-1984 [3] and this probably due to the increase in the number of male smokers or the amount of daily consumption.

The mean age of the patients is 62 years, 83.2% of them were 50 years old and above. This finding agrees with other studies conducted by Al-alusi [12], Al-Kafaji [13] and Al-Qassir [14], as it is well known there is an exponential increase in incidence rates with age for most adult malignancies and most cancers develop in the sixth, seventh, and eighth decades of life [5].

The distribution of the patients regarding their residence is nearly equal in urban and rural, this may be explained by the spreading of the smoking habit to the rural

areas which agrees with other national studies[12, 13, 14 and 18]. However, in USA and England the incidence of lung cancer is higher in urban than in rural inhabitants, this may be due to the effect of environmental pollution [16].

The percentages of smokers is 90.2%, ex-smokers is 6.7 %. This result is higher than those of other Iraqi studies [12, 13, 14, and 18], where the percentages of both smokers and ex-smokers ranging between 88% and 90.2% , which may be related to method of data obtaining. American Thoracic Society comments that smoking accounts for 80% - 90% of all cases of lung cancer, and it is easier to prevent than cure [16]. Cough is the most common clinical findings, found in 98.5% of patients, followed by haemoptysis (64.1%), dyspnea(48.2%), and chest pain(20.8%). These findings agree with that of all other studies and identical to that found in medical and surgical textbooks [1, 2, 4, 6, 9, 12, 13, 14 and 18].

Chest x-ray remains the simplest and cheapest sensitive means of investigation for suspicion in lung cancer detection, it was abnormal in 97.4% of the patients. Pulmonary shadow is the main findings (54.3%), with predilection to the right lobes than left, and upper than lower lobes. These findings agree with that of all other studies and are identical to that found in medical and surgical textbooks [1, 2, 4, 6, 9, 12, 13, 14 and 18].

The diagnosis of lung cancer always requires confirmation of malignant cells by a pathologist, even when symptoms and x-ray studies are suspicious for lung cancer [9]. The simplest method to establish the diagnosis is the examination of sputum under a microscope. If a tumor is centrally located and has invaded the airways, this procedure, known as a sputum cytology examination, may allow visualization of tumor cells for diagnosis. This is the most risk-free and inexpensive tissue diagnostic procedure, but its value is limited since tumor cells will not always be present in sputum even if a cancer is present. Also, non-cancerous cells may occasionally undergo changes in reaction to inflammation or injury that makes them look like cancer cells [5]. The sensitivity of sputum cytology ranges from 20%-80%, the least for peripheral and the greatest for central, especially if associated with haemoptysis [15]. The findings of this study agree with the above fact.

The cytological accuracy of pleural fluid examination in the diagnosis of lung cancer varies from 40%-80% [10], in lymph node biopsy it depends on whether the tumor reaches the lymph node(s) or not [8]. Transthoracic FNA is helpful to establish the diagnosis, especially when the tumor is peripheral and it is done by experienced hand under ultrasonic guide [9]. It was positive in 73.8% of patients which is lower than in Al-alusi (88%), and in Al-khafaji (90%) studies [12 & 13].

Bronchoscope is usually the most useful investigation as it can provide tissue (biopsies and bronchial brush samples) for pathological examination and allows direct visualization of the tracheo-bronchial tree including abnormalities such as tumors [5]. But unfortunately not all patients usually fit for this procedure and its sensitivity ranges between 20%-80%. In this study, bronchoscope was done in 83.6% of the patients and revealed abnormalities in 63.2% of them. These results agree with that of the previous Iraqi studies [12, 13, 14, and 18].

CT-scan and MRI evaluation provides information about tumor size, extent, nodal involvement as well as other organs involvement (e.g., central mediastinum, brain, abdominal organs ...etc.). This information considers being the corner stone in the management of the disease [7, 19]. In this study, this evaluation was done in

89.2% of the patients and was very useful in making the final decision about the diagnosis and management of the disease. Distant metastasis was found in 11.2%, invasion of the central mediastinal structures including heart, great vessels, trachea and esophagus in 28.7%, contra lateral mediastinal lymph nodes involvement in 14.3%. All the above criteria with sever or unstable cardiac or other medical conditions are the contra-indication for resection in bronchial carcinoma [6].

Open lung biopsy was done in 5.6% of cases when all other ways failed to reach the final diagnosis with 100% sensitivity rate. These results agree with the previous Iraqi studies [13, 14, and 20]. Chemotherapy and/ or radiotherapy are the management of more than 70% of cases [6, 7, and 8]. In this study it was so in 75.9% and the surgical choice was in 24.1% but the tumors were removed in 42.5% of operable patients. These findings are nearly the same as that found in textbooks and agree with other studies [12, 13, 14, and 18].

Squamous cell carcinoma is still the most common type of primary lung cancer in Iraq (42.6%) with a predominance in male gender, adenocarcinoma is the second common type with equal distribution in male and female, these findings disagree with the previous Iraqi studies [12, 13, 14, and 18], except Al- Azawi in 1995 [18], who found adenocarcinoma was predominant in female which may be explained by the type of his study sample.

Conclusions

Lung cancer is an important and serious public health problem with an increase in incidence and prevalence in Iraq; the male: female ratio is 2.5:1 with mean age of 62 years. Cough is the most common clinical findings, found in 98.5% of patients, followed by haemoptysis (64.1%); cigarette smoking is responsible for at least 90% of its etiology. Squamous cell carcinoma is the most common type of primary lung cancer in Iraq (42.6%) with predominance in male gender; adenocarcinoma is the second common type with equal distribution in male and female.

Recommendations

Lung cancer is a preventable disease. Primary prevention of lung cancer is by smoking cessation (implementation of national program for smoking cessation), while secondary prevention is by early diagnosis (screening person with high risk) and management. This is done in specialized center established for this purpose.

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