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RESEARCH ARTICLE

TISSUE DIAGNOSIS OF LUNG DISEASES OF PATIENTS ATTENDING AL-NOOR SPECIALIST HOSPITAL IN HOLLY MAKKAH, SAUDI ARABIA FROM 2003 – 2012.

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Abstract

The histopathological pattern of pulmonary diseases were determined based on age, gender, and nationality of tertiary hospital in holly Makkah, Saudi Arabia.

A cohort retrospective study all histopathological diagnosed cases of lung diseases between January 2003 and December 2012 through a computerized database search of the anatomic pathology archives. Out of 419 case studies, the most common histopathological diagnosed pulmonary diseases were pulmonary infections 218 (52%), followed by lung tumors 112 (26.7%), restrictive and obstructive lung diseases 18 cases for each (4.3%), and congenital pulmonary airway malformation 11 (2.6%). The percentage of in sufficient and unsatisfactory biopsies was 8.2% ,2% showed no pathological diagnosis on histological examination.

Out of 218 cases (52%) of pulmonary infections, 139 (33.2%) were bacterial infections, and 36 cases (8.66%) were tuberculosis, and pulmonary bullae came 3rd with 18 cases (4.3%). In the other hand, out of 26.7% lung tumors, 98.8% were malignant and 95.9% of them were primary. Bacterial infection was the most common pulmonary disease identified histopathological in every age group, while lung cancer came 2nd in patients of 40 years and above.

We concluded that pulmonary infections are the most common form of histopathological diagnosed lung diseases followed by lung tumors.

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Introduction:-

In developing countries, chronic lung diseases represent a challenge to public health due to their frequency, severity, and economic impact ^[2]. Lower respiratory tract infection including tuberculosis, chronic obstructive pulmonary diseases (COPD) and lung cancer are each among the leading 10 causes of death worldwide ^[3]. Lung diseases account for 1 in 5 deaths in the UK today, causing more than 58,500 deaths in men and 59,000 deaths in women in year 2004 ^[1].

To our knowledge, only one study have been reported so far on the pattern of histopathological diagnosed lung diseases from this region ^[17].

The extent of burden of pulmonary diseases in Saudi Arabia is not well studied and only few clinical studies ^[4-6] have been published in Saudi Arabia describing the prevalence of pulmonary diseases in hospitalized patients. In

this study, we determine the histopathological pattern of pulmonary diseases of tertiary hospital in Holly Makkah, Saudi Arabia.

Results:-

The present study identified 419 histopathological diagnosed cases of respiratory diseases in a period of 5 years (1428-1433). 272 (64.9%) were males and 147 (35.1%) were females, the male to female ratio being 1.8:1. The most common pathologically diagnosed respiratory diseases were inflammatory diseases 218 (52%), with male to female ratio of 1.6:1 followed by lung tumors 112 (26.7%) (M:F 2.9:1), obstructive and restrictive lung diseases with 18 cases for each (4.3%) (M:F 1.6:1 and 8:1 respectively), congenital pulmonary diseases 11 (2.6%) (M:F 0.8:1) in descending order of frequency (figure 1 and table 1). The percentage of insufficient and unsatisfactory biopsies was 8.2% (34 cases) (M:F 1.4:1); 8 cases (1.9%) (M:F 0.6:1) showed normal or unremarkable features on histopathological examination.

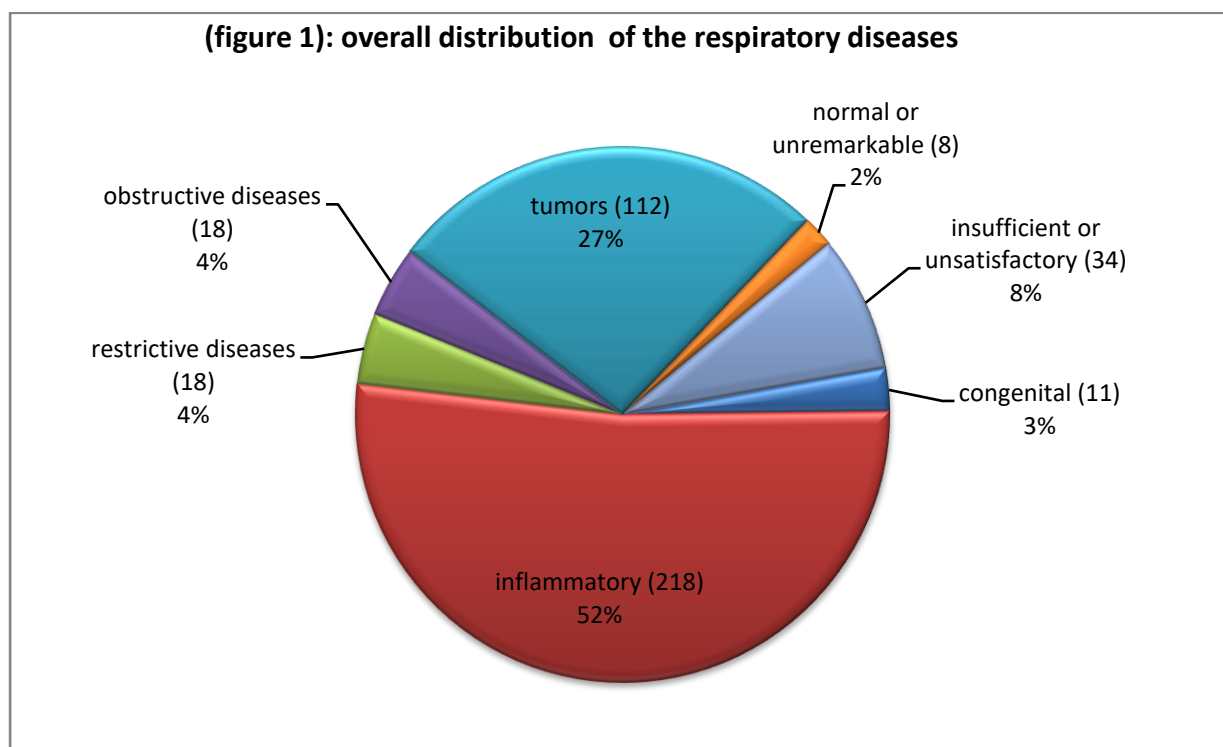


Table 1:- overall gender ratio of the respiratory diseases.

Category	M:F ratio
Congenital	0.8:1
Inflammatory	1.6:1
Restrictive lung diseases	8:1
Obstructive lung diseases	1.6:1
Lung tumor	2.9:1
Normal or unremarkable	0.6:1
Insufficient or unsatisfactory	1.4:1
Total	1.8:1

Sub-Category Divisions:-

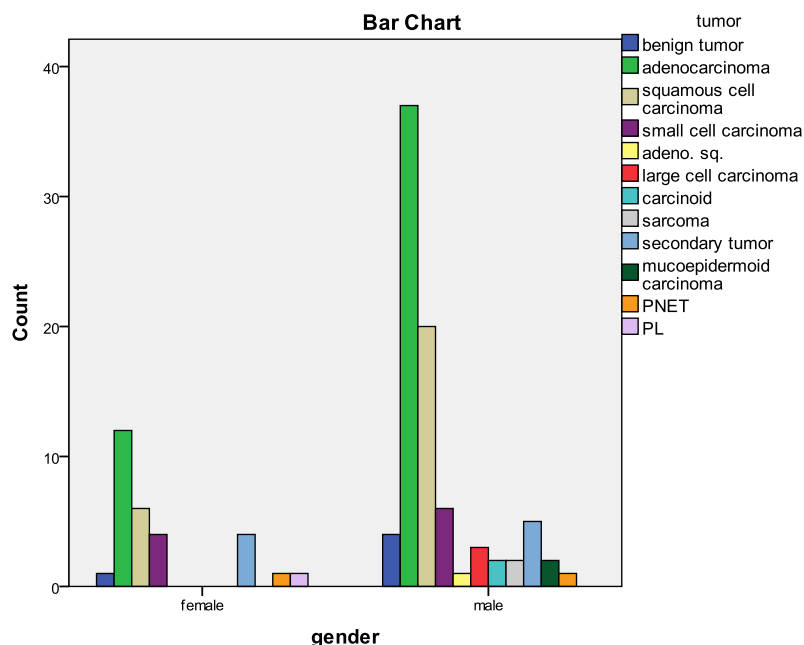
When the respiratory diseases are divided into the respected subcategories, out of 112 pulmonary tumors, 5 (1.2%) (M:F 4:1) were benign and 107 (98.8%) were malignant. However, out of the 107 malignant tumors, 98 (95.9%) were primary and 9 (2.1%) (M:F 1.2:1) were secondary tumors. (Table 2)

The primary malignant tumors were classified as follow (table 2): 49 cases (11.7%) (M:F 3:1) were adenocarcinomas, 26 cases (6.2%) (M:F 3.3:1) were squamous cell carcinomas, 10 cases (2.4) (M:F 1.5:1) were small cell carcinomas, 3 cases (0.7%) were large (Non-small) cell carcinomas all in males, carcinoid tumors represented 2 cases (0.5%) males only as well as primary sarcomas, mucoepidermoid carcinomas, and peripheral neuroectodermal tumors. Finally, primary lymphomas represented one case only (0.2%) of the sample with 1:1 male to female ratio. (Figure 3) shows the gender distribution of the lung tumors.

Table 2:- sub categorization of lung tumors with gender ratio.

	Frequency	Percent	M:F
Benign tumor	5	1.2	4:1
Adenocarcinoma	49	11.7	3:1
Squamous cell carcinoma	26	6.2	3.3:1
Small cell carcinoma	10	2.4	1.5:1
Adenosquamous carcinoma.	1	.2	1:0
Large cell carcinoma	3	.7	3:0
Carcinoid tumor	2	.5	2:0
Primary sarcoma	2	.5	2:0
mucoepidermoid carcinoma	2	.5	2:0
Peripheral neuroectodermal Tumor	2	.5	1:1
Primary lymphoma	1	.2	0:1
secondary tumor	9	2.1	1.2:1
Total	112	26.7	2.9:1

Figure 2:- the gender distribution of the lung tumors.



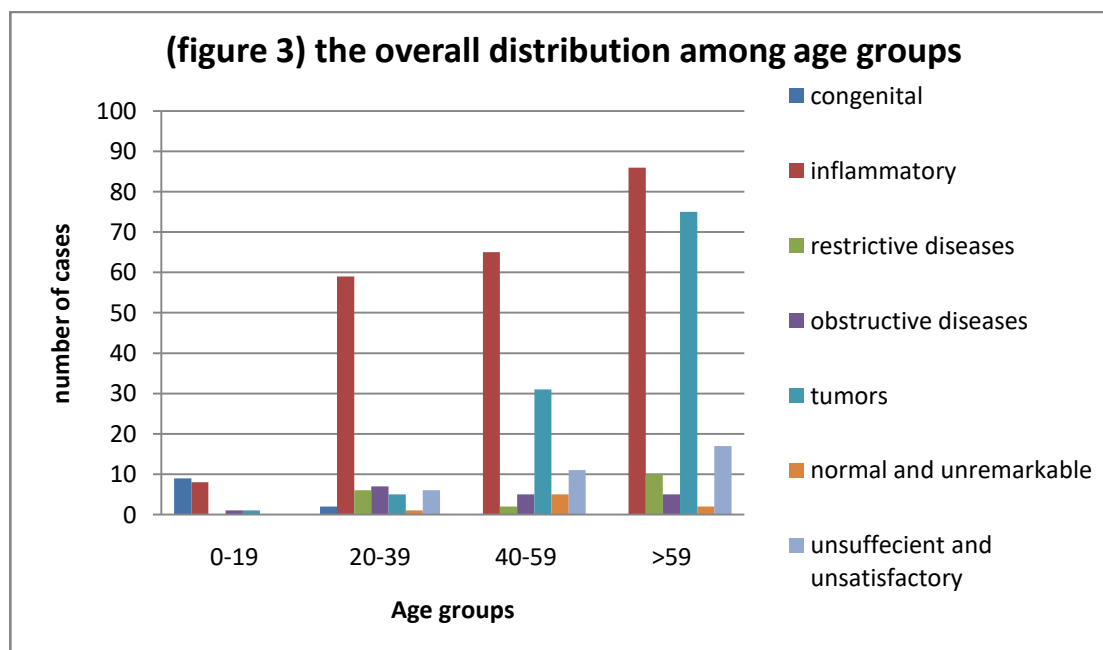
The most common inflammatory diseases was bacterial infections (table 3) with 139 cases (33.2%) (M:F 1.2:1) followed by tuberculosis with 36 cases (8.66%) (M:F 2:1), pulmonary bullae 18 cases (4.3%) (M:F 17:1), interstitial lung diseases 10 cases (2.4%) (M:F 7:1), bronchiolitis obliterans organizing pneumonia 5 cases (1.2%) (M:F 0.6:1), fungal infections 2 cases (0.5%) (M:F 1:1), hydrated cyst 2 cases (0.2%) males only, sarcoidosis 2 cases (0.5%) (M:F 1:1), inflammatory myofibrosis represented one male case only as well as Langerhans histiocytosis and non-specific inflammation. Finally, cystic lung represented one female case only.

Table 3:- sub categorization of the inflammatory diseases with gender ratio.

	Frequency	Percent	M:F
Bacterial infections	139	33.2	1.2:1
Tuberculosis	36	8.6	2:1
Fungal infections	2	.5	1:1
Non-specific inflammation	1	.2	1:0
Interstitial lung diseases	8	1.9	7:1
Bronchiolitis obliterans organizing pneumonia	5	1.2	0.6:1
Usual interstitial pneumonia	2	.5	1:1
Hydrated cyst	2	.5	2:0
Sarcoidosis	2	.5	1:1
Bullae	18	4.3	17:1
Inflammatory myofibrosis	1	.2	1:0
Langerhans histiocytosis	1	.2	1:0
Cystic lung	1	.2	0:1
Total	218	52.0	1.6:1

Age group Classifications:-

When respiratory diseases were classified according to the four specific age groups, the findings were as follow: in the age group 0-19 years old, a total of 19 cases were identified (figure 3). The most common respiratory diseases in this age group were pulmonary congenital diseases (nine cases) followed by inflammatory diseases (8 cases), restrictive lung diseases, and tumors (1 cases for each). In the age group 20-39 years old, a total of 86 cases were identified. The most common respiratory diseases in this age group were inflammatory lung diseases (59 cases) followed by obstructive lung diseases (7 cases), restrictive lung diseases (6 cases), lung tumors (5 cases),and congenital lung diseases (2 cases). In the age group of 40-59 years old, a total of 119 cases were identified. The most common respiratory diseases in this age group were also inflammatory lung diseases (65 cases) followed by lung tumors (31 cases), obstructive lung diseases (5 cases), and restrictive lung diseases (2 cases). In the age group of 60 years old or more, a total of 195 cases were identified. The most common respiratory diseases were inflammation again (86 cases) followed by lung tumors (75 cases), restrictive lung diseases (10 cases), and obstructive lung diseases (5 cases).



Discussion:-

The present study shows that the overall most common histopathological pattern of respiratory disease is inflammatory disease (218, 52%), followed by lung tumors (112, 26.7%), and obstructive and restrictive lung diseases with 18 cases for each (4.3%).

The data was compared with several local and international clinical studies. It was found that the present finding differ from the studies published from King abdulaiziz University Hospital by Alamoudi^[4], or Abdullah^[17] study which published from the same center.

Alamoudi^[4] reviewed the pattern of respiratory diseases in hospitalized patients in a period of 5 years. Based on his clinical analysis, asthma (38.6%), chronic obstructive pulmonary diseases (17.2%), pneumonia (11.5%), lung cancer (8%), and tuberculosis (7.2%) had the highest prevalence among hospitalized patients. The differences between Alamoudi^[4] study and our study in the other hands is that Alamoudi^[4] study concentrated on all hospitalized patients regardless of whether pathological biopsy was taken or not, while the present study are based on the analysis of all cases which underwent pathological examination only.

Another previous study was published from King Abdulaziz University Hospital by Abdullah^[17] and Mufti who reviewed a total of 378 histopathological patterns of respiratory diseases among patients attending a tertiary care center in western Saudi Arabia over a 10 years period. Based on that study, pulmonary tumors accounted for 31.2% of all cases, followed by pulmonary infection (8.4%), obstructive lung diseases (5.8), restrictive lung disease and congenital pulmonary airway malformation 4.2% for each.

The most common histopathological pattern of respiratory diseases in the present study is inflammatory diseased 218 (52%). Bacterial infections was the most common pulmonary infection (139, 33.2%) with male to female ratio of 1.2:1. followed by Tuberculosis (36, 8.6%) with male to female ratio of 2:1. and Bullae (18, 4.3%) with male to female ratio of 17:1. Pulmonary infections were more common in the age group of 60 years and more (86 cases) followed by age group of 40-59 years (65 cases). This pattern was different from the study by Abdullah^[17] where tuberculosis was the most common pulmonary infection 5.9%. While in Alamoudi^[4] study, tuberculosis was 7.2%.

Tuberculosis is the world's foremost cause of death from a single infectious agent, causing more than 26 percent of avoidable adult deaths in the developing world. According to WHO Tuberculosis Global Report 2013^[9], an estimated 8.6 million people developed TB, and 1.3 million died from the disease.

The second most common histopathological pattern of pulmonary diseases in the present study is pulmonary tumors. According to WHO, Lung cancer is the second most common cancer and the leading cause of death in patient with cancers. The incidence of lung cancer varies between different countries worldwide. Central and eastern Europe and North America have the highest rate of lung cancer in men, especially in Hungary and Poland. On the other hand, North America and northern Europe have the highest incidence of lung cancer in women^[11]. The lowest incidence rates in both men and women are found in African countries. Higher smoking rates in urban areas lead to higher rates of lung cancer in such areas. Other factors that may also contribute include poor diet, exposure to carcinogens and air pollution^[12,13]. In Saudi Arabia, lung cancer ranks fifth among male population and 15th among the female population, with a male to female ratio of 3:1^[14]. In USA, adenocarcinoma is considered now as the most common histopathological pattern of lung cancer^[13].

In Saudi Arabia, the pattern is slightly variable, Alamoudi^[15] in his study of 114 lung cancer cases identified that squamous cell carcinoma is the most common histologic type, with a mean age for lung cancer of 59.8. 71% were smokers and 95% were male patients. Country of these previous reports, the present data shows that adenocarcinoma was the most common pattern histopathological 49 cases (43.8%) squamous cell carcinoma comes second 23.2% followed by Small cell carcinoma 8.9%. overall male to female ratio was 2.9:1. The incidence if lung cancer is increasing significantly with age.

Much deference was noted in comparison with Abdullah^[17] study when it comes to sub-category divisions. In Lung tumors, Non-small cell lung carcinoma (NSCLC) accounted for 90.8% of lung cancers. Of all lung cancers, large cell carcinoma came first with 41.8%, followed by Squamous cell carcinoma 22.4% and adenocarcinoma 17.3%.

Obstructive and restrictive lung diseases ranks the third most common histopathological pattern of pulmonary diseases, with 18 cases for each (4.3%). Obstructive lung diseases are more common in age group 20-39 years than any other age group with a male to female ratio of 1.6:1, while in restrictive lung diseases are more common in age group of 60 years and more followed by age group of 20-39 years with a male to female ratio of 8:1. In Abdullah^[17] study, obstructive lung diseases ranked third to 5.8%, but it were more common in age group of 40-59 years.

Congenital lung malformations rank fourth commonest histopathological pattern 2.4%, it is more common in age group of 0-19 years with a male to female ratio of 0.8:1. The percentage of in sufficient and unsatisfactory biopsies was 8.2%, 2% showed no pathological diagnosis on histological examination.

Conclusion:-

The present study conclude that inflammatory diseases are the most common form of histopathological diagnosed respiratory diseases in this region especially bacterial and tuberculosis, followed by pulmonary tumors especially adenocarcinoma. Incidence in both inflammatory diseases and pulmonary tumors increase with age.

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