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Original Research Article

The Role of Chest X-ray in the Diagnosis of Pneumonia

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Abstract: Pneumonia is an inflammatory condition of the lung affecting primarily the microscopic air sacs known as alveoli. It is usually caused by infection with viruses or bacteria and less commonly other micro-organisms, certain drugs and other conditions such as autoimmune diseases. This study is a retrospective experimental study by using chest x-ray in the diagnosis of pneumonia. The study undertaken at King Abdul Aziz specialist Hospital, in the radiological department. The number of the patients involved in this study was 50 patients. All patients were suffering from pneumonia. The study showed that gender was semi same in catching the pneumonia 52%male, 48% female. The age of high incidence of pneumonia, was above 71, 11 patients 22%. The signs and symptoms of pneumonia were fever 50 patients 26%, cough 50 patients 26%, weight Loss 43 patients 23%, chest pain 41 patients 22%, and vomiting 6 patients 3%. The chest findings of the patients with pneumonia arranged from consolidation 41 patients 59%, midline shift17 patients 25%, pleural Effusion 8patients 12%, and fibrosis 3patients 4%. Any one suffering from fever, chest pain and cough must contact the physician. Patients with chest pain, cough, and fever should be requested to do chest x-ray.
Keywords:X-Ray- Chest-Pneumonia, pleural Effusion

INTRODUCTION

Pneumonia is an inflammatory condition of the lung affecting primarily the microscopic air sacs known as alveoli [1, 2]. It is usually caused by infection with viruses or bacteria and less commonly other microorganisms, certain drugs and other conditions such as autoimmune diseases [1, 3].

Typical symptoms include a cough, chest pain, fever, and difficulty of breathing [4]. Diagnostic tools include x-rays and culture of the sputum. Vaccines to prevent certain types of pneumonia to be available. Treatment depends on the underlying cause. Pneumonia presumed to be bacterial is treated with antibiotics. If the pneumonia is severe, the affected person is generally hospitalized.

Pneumonia affects approximately 450 million people globally per year, seven percent of population, and results in about 4 million deaths, mostly in developing countries. Although pneumonia was regarded by William Osler in the 19th century as "the captain of the men of death," [5] the advent of antibiotic therapy and vaccines in the 20th century has seen improvements in survival [6]. Nevertheless, in developing countries, and among the very old, the very young, and the chronically ill, pneumonia remains a leading cause of death [6, 7]. In the terminally ill and elderly, especially those with other conditions, pneumonia is often the immediate cause of death. In such cases, particularly when it cuts short the suffering associated with lingering illness, pneumonia has often been called "the old man's friend." [8].

Pneumonia is a common illness affecting approximately 450 million people a year and occurring in all parts of the world [2]. It is a major cause of death among all age groups resulting in 4 million deaths (7% of the world's yearly total) [2, 3]. Rates are greatest in children less than five and adults older than 75 years of age [2]. It occurs about five times more frequently in the developing world versus the developed world [2]. Viral pneumonia accounts for about 200 million cases [2].

In the United Kingdom, the annual incidence rate of pneumonia is approximately 6 cases per 1000 people in individuals aged 18–39 years. For those over 75 years of age, the incidence rate rises to 75 cases per 1000 people. Roughly 20–40% of individuals who contract pneumonia requires hospital admission, with between 5–10% of these admitted to a critical care unit. The case fatality rate in the UK is around 5–10% [2].

OBJECTIVES:

General Objectives:

To show the accuracy of chest x-ray in the diagnosis of pneumonia

Specific objectives:

- To show the radiographic appearance of pneumonia.
- To show the signs and symptoms of the patients with pneumonia.

MATERIALS AND METHODS:

The study undertaken at King Abdul Aziz specialist Hospital, in the radiological department. The number of the patients involved in this study was 50 patients. All patients suffering from pneumonia.

This study is retrospective and descriptive study by using chest x-ray in the diagnosis of pneumonia. This study was carried out in Taif City. The patients came from different areas in Taif City to King Abdul Aziz specialist Hospital. The study had been conducted from the period of 2014up to2015.All patients who had been confirmed pneumonia, patient sent to radiological department at the time of this study.There were 50 patients with chest infection had been diagnosed as pneumonia attended in radiological department of Abdul Aziz specialist hospital. The sample had been selected randomly by the technique of non-probability method. The data was collected using the clinical data collection sheets which containing all the variables of the study.

Chest x-ray reporting:

A radiologist with expertise in supervising and interpreting radiological examinations had analyzed the images and sent the signed report to the primary care physician or the physician who referred the patient for the exam.

The techniques:-

The techniques which were applied to the CT imaging include the patient's preparation, the patient's positioning, and the scanning protocols.

Data analysis:

The data had been analyzed by statistically package for social sciences SPSS.

Data presentation:

The data had been presented in dummy tables and figures.

RESULTS

Table 1: Shows the frequency distribution of patients according to the gender

Gender	Frequency	Percent
Male	26	52%
Female	24	48%
Total	50	100%

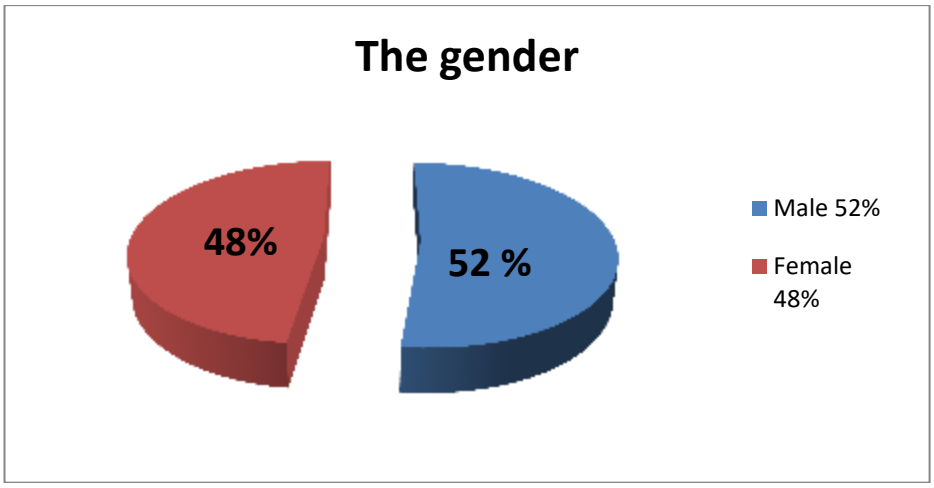

Fig. 1: Distribution of patients according to the gender

Table 2: Shows the frequency distribution of patients according to the age

Age group (years)	Frequency	Percent
1-10	5	10%
11-20	2	4%
21-30	5	10%
31-40	3	6%
41-50	8	16%
51-60	6	12%
61-70	10	20%
Above 71	11	22%
Total	50	100%

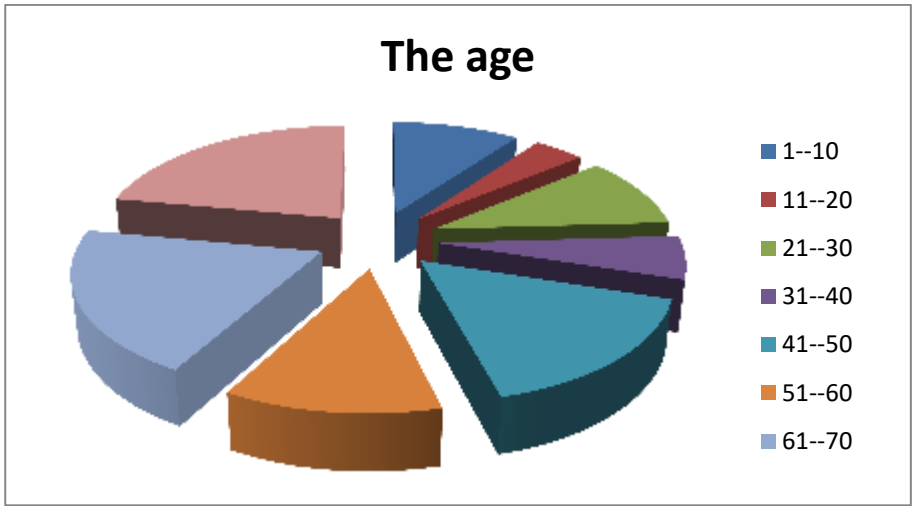

Fig 2 shows the frequency distribution of patients according to the age.

Table 3 Shows the Signs& Symptoms of the patients with pneumonia

Sign &Symptoms	Frequency	Percentage%
Fever	50	26%
Cough	50	26%
Wight Loss	43	23%
Chest Pain	41	22%
Vomiting	6	3%

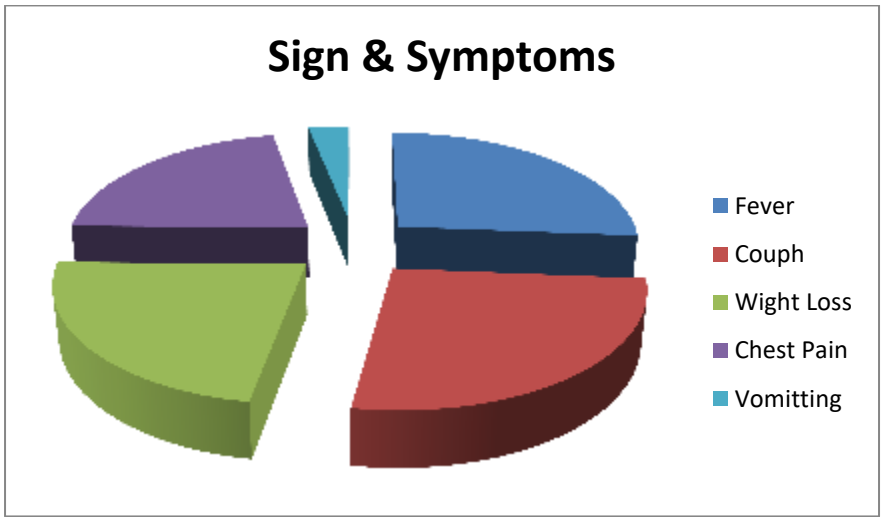

Fig 3: Shows the frequency distribution of patients according to the Signs & Symptoms

Table 4: Shows the chest findings of the patients with pneumonia

Chest Findings	Frequency	Percentage %
Consolidation	41	59%
Midline shift	17	25%
Pleural Effusion	8	12%
Fibrosis	3	4%

DISCUSSION:

For many years, chest x-rays were considered the gold standard for diagnosis of pneumonia. In recent years, literature has documented that CXR may miss a significant number of pneumonia as visible on CT. In a prospective study of 47 patients with suspected pneumonia who underwent both CT and CXR, 31% of pneumonias diagnosed by CT were not visualized on CXR.4 In a large retrospective study of 1057 adult ED patients with pneumonia, 97 patients underwent both CXR and chest CT. Pneumonia remains a common condition and CXR remains the standard of care for diagnosing pneumonia. As such, our results remain relevant to contemporary emergency medicine practice [9].

This study run with our study that the chest x-rays is more beneficial in the diagnosis of pneumonia.A chest radiograph is frequently used in diagnosis. In people with mild disease, imaging is needed only in those with potential complications, those not having improved with treatment, or those in which the cause is uncertain. If a person is sufficiently sick to require hospitalization, a chest radiograph is recommended. Findings do not always match the severity of disease and do not reliably separate between bacterial infection and viral infection.

X-ray presentations of pneumonia may be classified as lobar pneumonia, bronchopneumonia (also known as lobular pneumonia), and interstitial pneumonia. Bacterial, community-acquired pneumonia classically show lung consolidation of one lung segmental lobe, which is known as lobar pneumonia. However, findings may vary, and other patterns are common in other types of pneumonia. Aspiration pneumonia may present with bilateral opacities primarily in the bases of the lungs and on the right side. Radiographs of viral pneumonia may appear normal, appear hyper-inflated, have bilateral patchy areas, or present similar to bacterial pneumonia with lobar consolidation. Radiologic findings may not be present in the early stages of the disease, especially in the presence of dehydration, or may be difficult to be interpreted in the obese or those with a history of lung disease. A CT scan can give additional information in indeterminate cases [10].

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