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Diagnosis of Coronavirus Disease (COVID-19) by X-ray

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ABSTRACT

Objective: The objective of the present paper was to study the diagnosis of Coronavirus Disease (COVID-19) by X-ray.

Methods: A study of eight patients for COVID diagnosis by X-ray imaging was carried out. The ages of the patients ranged from 18 to 80 years. The study was conducted at Baqubah General Hospital, Baqubah, Iraq. COVID was diagnosed by X-ray imaging, where X-rays were taken of the patient's chest in a posterior-anterior (PA) view.

Findings: The X-ray produces a crisp radiographic image with high resolution and a two-dimensional view of the patient's chest in the posterior-anterior position. X-ray is considered a clear method of diagnosing COVID. Furthermore, X-rays are less expensive, more commonly available in hospitals, and take less time to check the patient's chest.

Conclusions: X-ray imaging is a quick, reliable, and widely available tool for diagnosing COVID-19, offering clear chest images at a low cost.

KEYWORDS: Covid-19; X-ray; Lungs; Pneumonia

1. INTRODUCTION

Despite the presence of some dangerous types of coronavirus disease, most of the early cases were associated with the seafood market in Southern China's Wuhan, and there is widespread speculation that the wildlife sold there is intermeshed with Covid. The first instances were reported in December 2019 in Wuhan, Hubei Province, central China. Many of the early victims visited or worked at Wuhan's 'Hunan' seafood market, indicating that the disease is transferring from animals to humans. However, it is now possible to transmit from person to person among people. Covid is a virus that

infects to causes the respiratory system, gut inflammation, and as well as renal failure. It also causes acute pneumonia, and other health problems [1, 2]. Symptoms include fever, cough, pain in the body, loss of taste and smell, sore throat, hyperthermia, hypoxia, dyspnea, and others [1]. There have been many confirmed cases of the new crown virus worldwide, including recovered patients and deaths, and disease outbreaks in many countries and regions. Covid spread almost all over the world [1, 3].

The virus may prevent oxygen from reaching the blood, causing impairment in the functions of body organs and, in some circumstances, symptoms may develop into acute lung inflammation due to damage to the alveoli and swelling of the lung tissue until death [1, 2, 4-6]. Pneumonia is a lung illness caused by an acute respiratory infection and the alveoli get clogged with pus and fluid, making breathing difficult and limiting oxygen intake [1, 4]. GGO (ground glass nodules) can be observed on a chest by x-ray imaging or computed tomography (CT) scan of the lungs. An area of hazy opacification due to air displacement by fluid, airway collapse, fibrosis, or a neoplastic activity is commonly identified by x-ray image or CT scan image [4].

The diagnosis of a Covid can be made by taking a radiographic image of the patient's chest in posterior-anterior view (PA) using x-ray imaging. This examination is distinguished using x-ray imaging to provide a high-resolution image of the bones, spine, lungs, ribs, heart, and tissues. Pneumonia, chronic lung infections, chronic obstructive pulmonary disease, pulmonary contraction, lung tumors, and other lung problems can all be diagnosed by x-ray imaging. The x-ray could be viewed on a computer in two dimensions, and radiographic image technologies are easy to use on a computer.

Radiation X-rays are a painless and quick procedure that generates images of the inside of the human body, particularly the bones. X-ray beams flow through the body and depending on the density of the material they pass through; they are absorbed in varying amounts. On X-ray scans, dense materials like bone and metal appear color white. The air in the lungs appears to be black. Fat and muscle appear as grayscale images. A chest x-ray test uses a little quantity of radiation to create a picture of the heart, lungs, blood vessels, spine, bones, and others inside the chest. A focused beam of radiation is transmitted through the body during an x-ray, creating a black-and-white image that is captured on special film or in a computer. Lung diseases, lung congestion, emphysema, TB, lung cancer, and others can all be diagnosed with a chest x-ray. Congestive heart failure, for example, is a type of heart disease (which causes cardiomegaly) that can all be diagnosed with a chest x-ray. Fractures of the ribs and collarbone, as well as fractures of the bones above the spine diagnosed by chest x-ray. Shortness of breath, a strong and persistent cough, or chest pain are all symptoms of asthma, pneumonia, and GGO, which can all be diagnosed with a chest x-ray [4]. Due to the

development of a clear and two-dimensional radiological image of the patients' chest to detect disorders in the lungs, now research investigations are being conducted on the use of x-ray for Covid diagnosis. In this context, the objective of the present paper was to study the diagnosis of Coronavirus Disease (COVID-19) by X-ray.

2. METHODS

2.1. Participants

A study of eight patients for Covid diagnosis by x-ray imaging was carried out. The ages of the patients were between 18 and 80 years. The study was carried out at Baqubah General Hospital, Baqubah, Iraq.

2.2. Instruments and procedures

COVID was diagnosed by X-ray imaging, where X-rays were taken of the patient's chest in a posterior-anterior (PA) view. The use of X-ray imaging provides a high-resolution image of the bones, lungs, ribs, heart, tissues, and other structures, distinguishing this examination. X-ray imaging can diagnose COVID, pneumonia, GGO, persistent lung infections, lung tumors, and other lung issues. The X-ray image is displayed in two dimensions, and radiographic imaging technologies are simple to use on a computer.

3. RESULTS AND DISCUSSION

The results of the 8 participants (cases) are presented and discussed in this section. Case 1 is a male patient aged 78 years old, who suffers from pain, hyperthermia, and dyspnea. Figure 1 shows that case 1 has pneumonia in both lungs. Case 2 is a male patient aged 60 years old, who suffers from acute dyspnea, hyperthermia, pain, and coughing. Figure 2 shows that case 2 has TB and Covid in both lungs. Case 3 is a male patient who suffers from acute hypoxia, hyperthermia, dyspnea, and pain in the body. Figure 3 shows that case 3 has pneumonia in both lungs. Case 4 is a male patient aged 33 years old, who suffers from dyspnea and pain in the body. Figure 4 shows that case 4 has Covid in both lungs. Case 5 is a female patient aged 45 years old, who suffers from acute coughing, hypoxia, dyspnea, and hyperthermia. Figure 5 shows that case 5 has Covid in both lungs. Case 6 is a male patient aged 38 years old, who suffers from headache, pain in the body, coughing, and hyperthermia. Figure 6 shows that case 6 has Covid in both lungs. Case 7 is a male patient aged 43 years old, who suffers from eyes pain, muscle aches, hyperthermia, loss of taste and smell, and coughing. Figure 7 shows that case 7 has

GGO in both lungs. Case 8 is a male patient aged 65 years old, who suffers from acute pain in the body, loss of taste and smell, sore throat, hyperthermia, and coughing. Figure 8 shows that case 8 is infected with Covid.

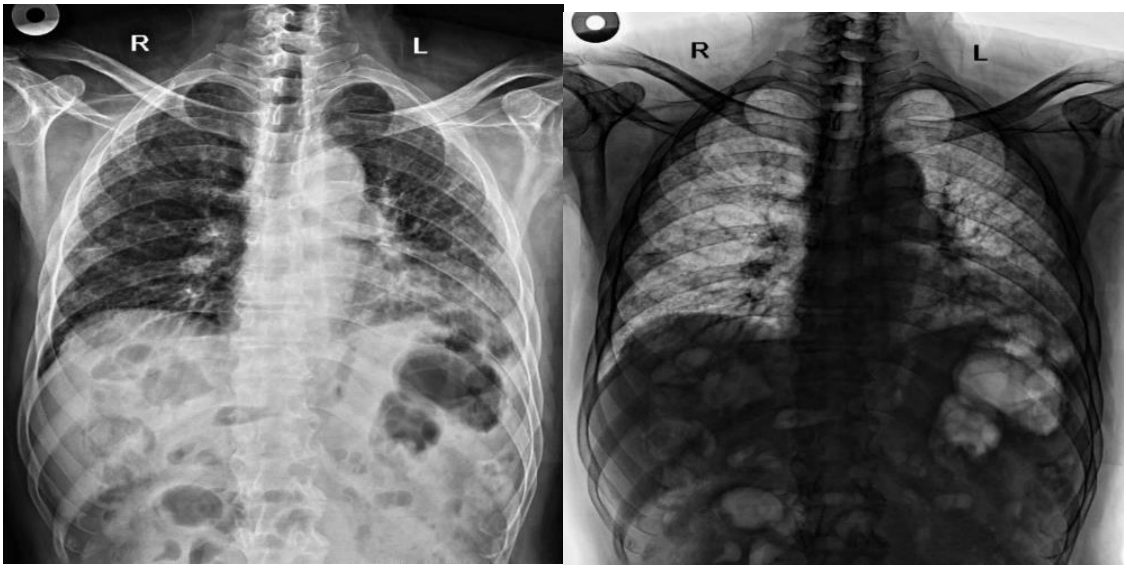

Figure 1. Patient 1

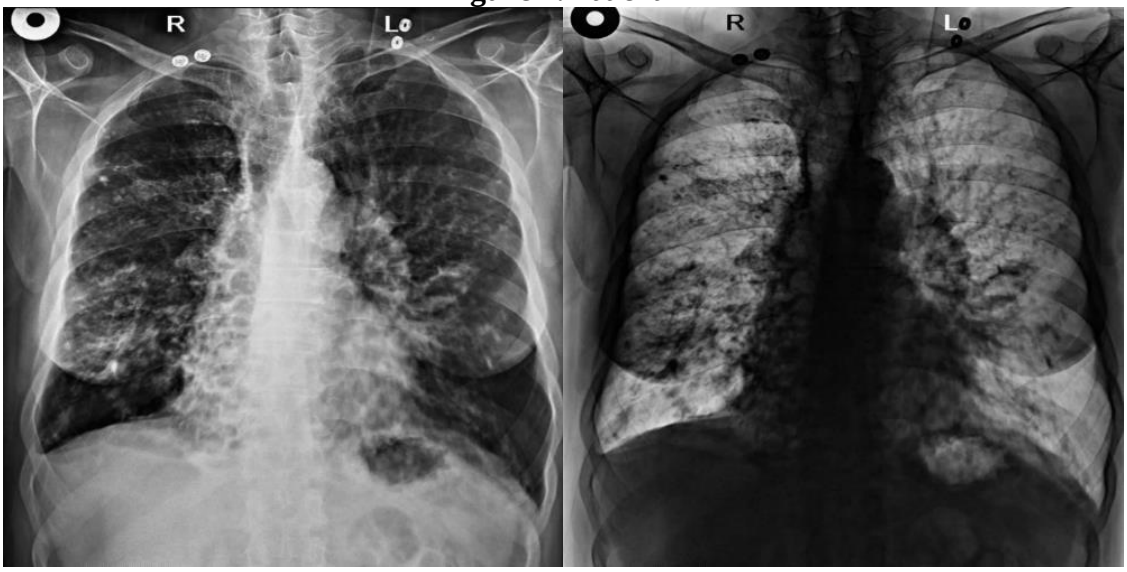

Figure 2. Patient 2

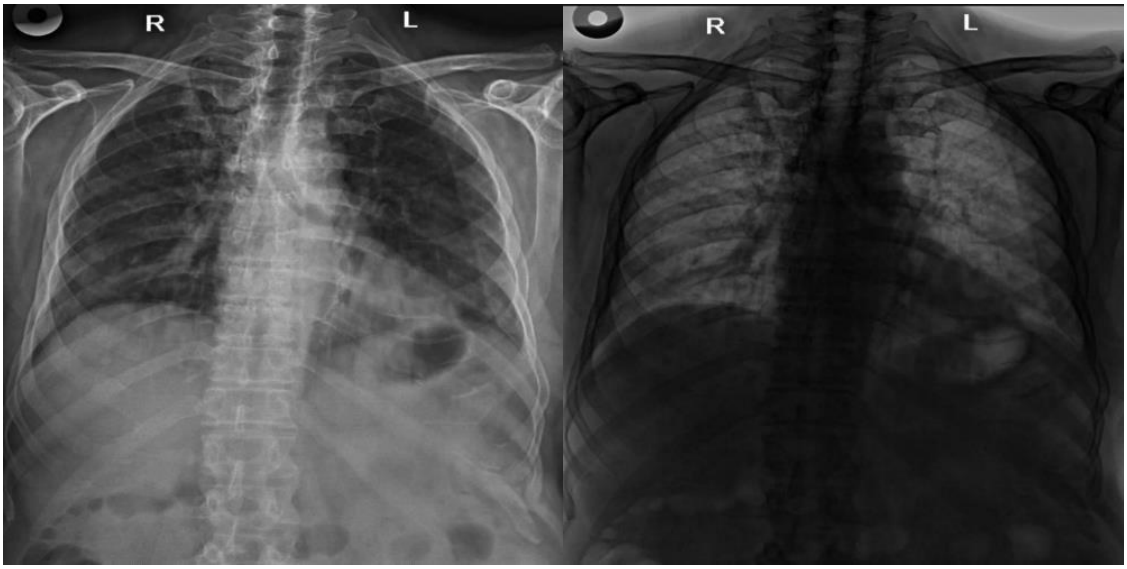

Figure 3. Patient 3

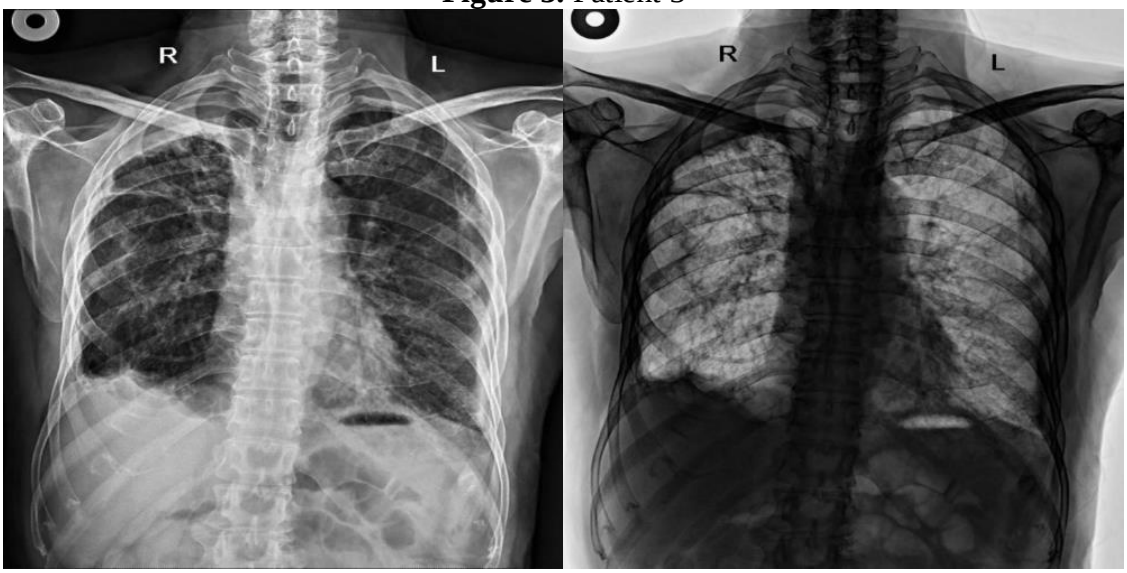

Figure 4. Patient 4

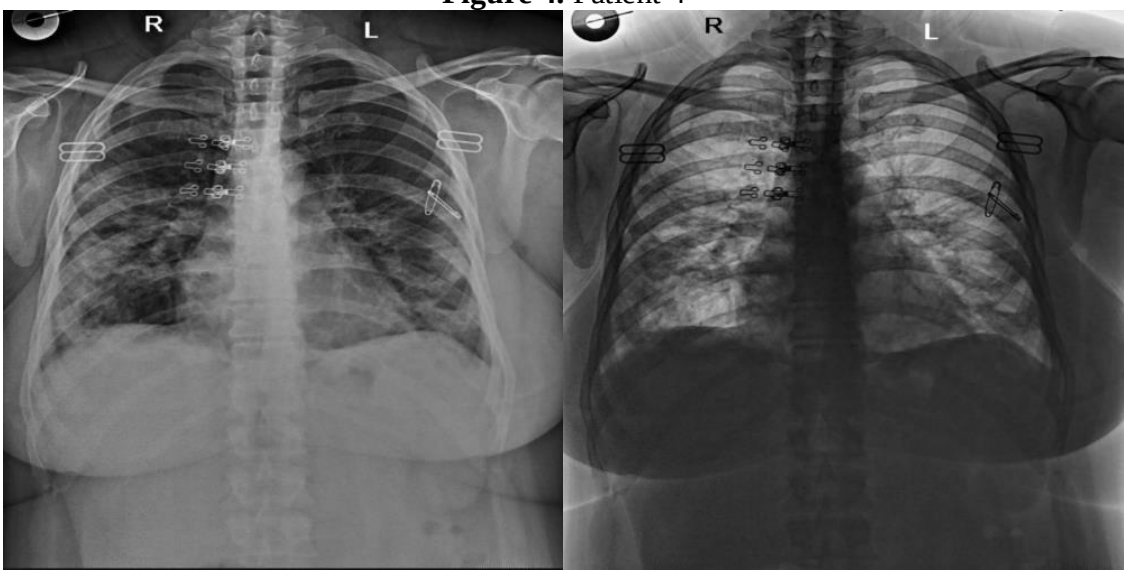

Figure 5. Patient 5

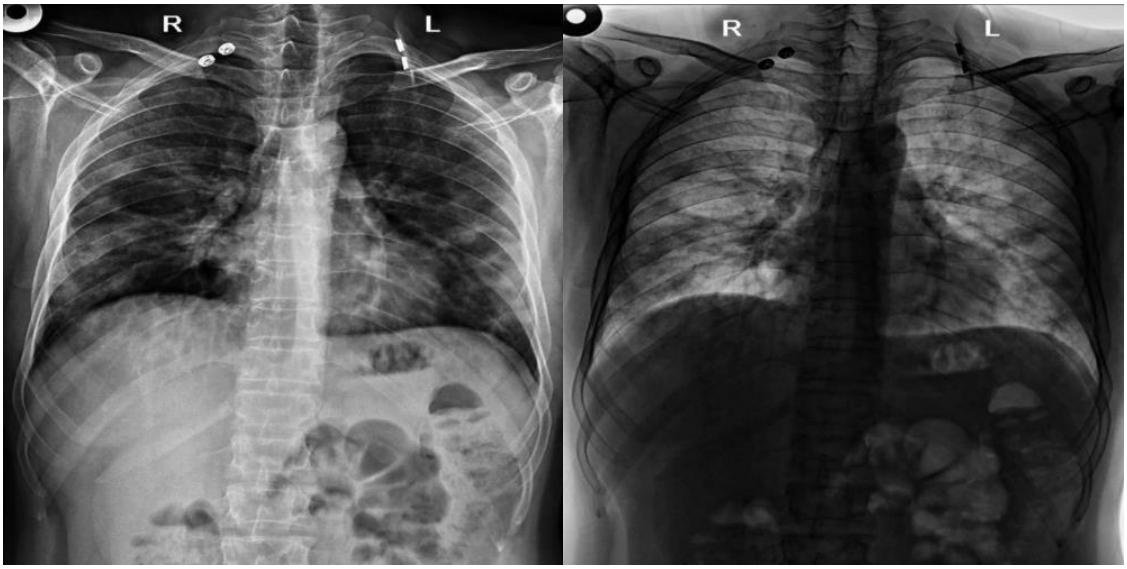

Figure 6. Patient 6

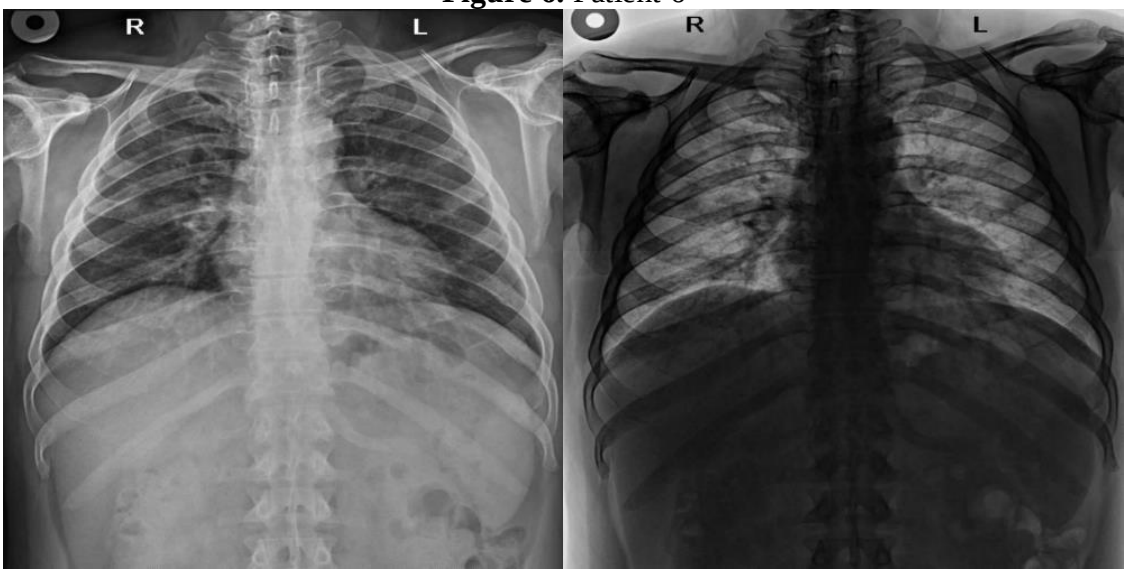

Figure 7. Patient 7

Figure 8. Patient 8

4. CONCLUSIONS

Considering the results of the present study, x-ray imaging could be used to diagnose the Covid disease and to lower the number of people infected with Covid. The x-ray can be employed for Covid diagnosis because of its excellent radiographic picture quality, high resolution, and two-dimensional image of a patient's chest in a posterior-anterior view (PA). In hospitals, the x-ray is more efficient, less expensive, more accessible and available. Also, the x-ray is a less time-consuming tool for the diagnosis of patients with Covid.

5. REFERENCES

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AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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