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Knowledge of general physicians in interpreting chest computed tomography used to examine Coronavirus Disease-2019 in Iran

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Case Report

Abstract

BACKGROUND: Lung is the primary organ affected by the Coronavirus Disease-2019 (COVID-19) virus, which causes pneumonia, an acute respiratory distress syndrome (ARDS). Lung computed tomography (CT) is a very useful and practical modality in diagnosing COVID-19 due to its speed and high sensitivity in determining the severity. When visiting patients with suspected COVID-19 in hospitals, general practitioners are usually the first medical staff to visit these patients. Therefore, sufficient knowledge in the interpretation of the patients' lung CT scan is essential for general practitioners.

CASE REPORT: A 28-year-old male patient referred to a physician at the hospital. He had only the symptoms of shortness of breath and mild chest pain during deep breathing. The general practitioner requested a CT scan of the patient; in addition, the physician diagnosed that the lungs were healthy and prescribed azithromycin and diphenhydramine syrup. Since the patient was a medical staff and was fully acquainted with CT scans, he became suspicious of the stereotype of his lung image and referred to an infectious disease specialist. Upon seeing the CT, the specialist immediately became suspicious of COVID-19 and referred the CT to a radiologist.

CONCLUSION: In order to prevent misdiagnosis and spread of COVID-19 in the examinations, it is necessary to enhance the general practitioners' knowledge of the CT scan of lungs of suspected patients and patients with low lung infection, which can be difficult for general practitioners, by infectious disease specialists and radiologists.

KEYWORDS: Coronavirus Disease-2019; Chest Computed Tomography; General Physicians; Image Interpretation

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Introduction

The Coronavirus Disease-2019 (COVID-19) virus is spreading rapidly throughout the world. By October 15, 2020, 39,062,945 people were infected by COVID-19; moreover, 1,100,588 of these patients were died.[1] Lung is the primary organ affected by the Coronavirus Disease-2019 (COVID-19) virus, which causes pneumonia, an acute respiratory distress syndrome (ARDS)[1]. This virus infects the lower respiratory system, and the lung's response to this infection is recruiting macrophages and monocytes leading to inflammation, and this response causes widespread damage to airways.[2]

Detection modalities such as lung computed tomography (CT) and polymerase chain reaction (PCR) are applied to detect this virus. In the study of sensitivity of lung CT and PCR, the results indicate that the sensitivities of lung CT and PCR are 98% and 71%, respectively. The reasons for the low sensitivity of PCR can include: (a) mature development of nucleic acid detection technology, (b) variation in detection rate from different manufacturers, (c) low patient viral load, or (d) improper clinical

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sampling. Therefore, it is recommended that suspected patients whose PCR test results are negative be screened with CT.[3]

Studies have shown that chest CT is of noteworthy clinical value in the assessment of the course and severity of COVID-19 virus.[4] Patients with confirmed COVID-19 have some similarity in their chest CT images. Most of them have ground-glass opacification (GGO), vascular enlargement, bilateral involvement, and peripheral distribution.[5]

Therefore, lung CT is a very useful and practical modality in diagnosing COVID-19 due to its speed and high sensitivity in determining the severity and stage of this disease. When visiting patients with suspected COVID-19 in hospitals, general practitioners are usually the first medical staff to visit these patients. Moreover, due to the general symptoms of the virus, if a patient is suspected of having COVID-19, he/she may be asked for a CT scan in order to be informed about its condition. In medical centers, due to the limited number of infectious disease specialists and radiologists, the initial diagnosis of the disease and the evaluation of the patient's lung CT are usually performed by a general physician. Therefore, sufficient knowledge in the interpretation of CT scan of the patients' lungs is essential for general practitioners in order to refer patients suspected of COVID-19 to relevant specialists if necessary. To the best of the author's knowledge, there was no study evaluating the role of general physician's knowledge in interpreting chest CT image to examine the COVID-19 spread. The reason for this can be due to the fact that interpretation of the radiography images is performed just by radiologists in other countries. Therefore, the author decided to report a case showing the importance of the role of general physician's knowledge in interpreting chest CT images to examine the COVID-19 condition among the patients in Iran.

Case Report

Figure 1 illustrates the lungs of a 28-year-old male patient who referred to a physician at Tohid Hospital in Sanandaj, Iran. He had only the symptoms of shortness of breath and mild chest pain during deep breathing. The general practitioner requested a CT scan of the patient; in addition, he/she diagnosed that the lungs were healthy and prescribed azithromycin and diphenhydramine syrup. The CT image of this patient is shown below. Since the patient was a medical staff and was fully acquainted with CT scans, he became suspicious of the stereotype of his lung image and referred to an infectious disease specialist. Upon seeing the CT, the specialist immediately became suspicious of COVID-19 and referred the CT to a radiologist. The radiologist reported the presence of a ground-glass opacification (GGO) to consolidation in the apical medial right lower lobe (RLL). Drug treatment and quarantine were performed immediately for the patient. He also requested a PCR test for the patient, which was positive.

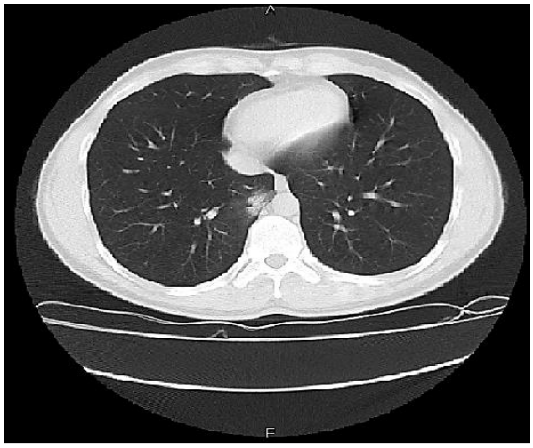

Figure 1. Image of ground-glass opacification (GGO) to consolidation in medial apical right lower lobe (RLL) on the patient's computed tomography (CT) scan

If this patient lacked knowledge of CT scan and COVID-19, because the general practitioner diagnosed him as healthy, he would enter the community since he was assured that he was not a carrier of COVID-19. Thus, he/she could infect the people around

him, including all his family members, colleagues, and friends, leading to a catastrophe in the spread of the COVID-19.

Discussion

The main strengths of the present study was the emphasis on the importance of knowledge of general participations in interpreting chest CT images of patients with COVID-19 during the pandemic. The limitation of this study was the small sample size. Radiologists have responsibility for interpreting radiography images, however due to the small number of radiologists and their presence just in the morning shift in the hospital, on the other hand, the high volume of chest CT orders, general physicians usually interpret CT images in Iran during the pandemic. Therefore, enhancing knowledge of general physicians for interpreting chest CT image is critical for accurate diagnosis and prevention of outbreaks of the disease.

Conclusion

In order to prevent misdiagnosis and spread of COVID-19 in the community, it is recommended that general practitioners' knowledge of CT scan of the lungs of suspected patients and patients with low lung infection, which can be difficult for general practitioners, be promoted by holding webinars and training classes for them by infectious disease specialists and radiologists. Because the misdiagnosis of COVID-19 in patients with this disease and considering them healthy cause the virus to spread very quickly in the community.

Conflict of Interests

The author has no conflict of interests.

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