The Role of Radiologic Technology in Enforcing Diagnosis of Covid-19 Disease: Case Report at RSPAW Salatiga

Lilik Lestari*
dr. Ario Wirawan Pulmonary Hospital, Salatiga

ARTICLE INFO

Article history:
Received: 01 October 2020
Received in revised form: 15 October 2020
Accepted: 30 October 2020

Keywords:
Covid-19
radiologic technology
chest X-Ray

ABSTRACT

Coronavirus has become a world pandemic since WHO announced it in March 2020. This study aims to report on the role of radiologic technology in helping to diagnose Covid-19 disease handled by RSPAW Salatiga. The research method chosen was descriptive-analytic case reports. The results of the study explained that radiologic technology of chest X-Ray was able to provide an image of Covid-19 with 89% sensitivity, namely the discovery of reticulonodular, ground-glass opacity (GGO), crazy paving, consolidation, location in the periphery of the lung, and the inferior lobe of the lung.

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1. INTRODUCTION

Covid-19 is a contagious disease and is a pandemic that rapidly spread to all countries in the world. Covid-19 is transmitted from human to human, that is, through a splash of droplets from the nose or mouth of an infected person when they cough, sneeze or talk. Covid-19 causes inflammatory lesions in the lungs, damage to the intestines, and liver.

In 2020, a new type of virus (SARS-CoV-2) has spread, which disease is called Coronavirus disease 2019 (COVID 19) (Yuliana, 2020). WHO officially announced Covid-19 as a pandemic in March 2020 (Sarkodie, Osei-Poku, & Brakohiapa, 2020). WHO data states that as of early October 2020, 235 countries have been infected, with more than 36 million people confirmed, and more than one million people dead (www.who.int). In Indonesia itself, in early October 2020, it was recorded that more than 328,962 people were confirmed positive, with 25,481 patients successfully recovered, but 11,765 patients died (www.covid19.go.id).

Lung Hospital dr. Ario Wirawan (RSPAW) Salatiga is one of the Covid-19 referral hospitals with a service area in the province of Central Java. RSPAW Salatiga has many experts for handing and treating Covid-19 patients. Gold max detection of Covid-19 diagnosis is the discovery of nucleic acids in the virus.

Radiology of Chest X-ray plays a role to help diagnose Covid-19 disease. The gold standard for Covid-19 diagnosis is nucleic acid detection, the presence of glycolic acid in the virus, but imaging has an important

*E-mail: liliklestarirspaw@gmail.com
role in detecting lung lesions, stratification, evaluation of treatment, and differentiation of mixed infections (Qiang et al., 2016). The use of chest radiology (CXR) concerning Covid-19 contains a variety of terminology as well as an assessment of its sensitivity and specifications (Litmanovich, Chung, & Kicska, 2020). Based on Cozzi et al. (2020) result of the study, chest X-Ray has a sensitivity of 89% for detecting covid-19 pneumonia during the peak of the pandemic, with higher specifications in the hands of Radiologists compare to those with less experience, and the sensitivity in detecting covid-19 pneumonia increases over time.

Patients with Covid-19 required hospitalization, 69% abnormal chest radiographs on initial admission, and 80% had occasional radiographic abnormalities during hospitalization. The most frequent radiographic findings in Covid-19 are ground-glass opacity (GGO), nodules in the lungs, lung consolidation, reticulonodular opacity, and consolidation. They are located in the peripheral and inferior lobe of the lung (Sarkodie et al., 2020).

The role of radiology in helping to diagnose covid-19 disease has attracted researchers (Sarkodie et al., 2020). However, in Indonesia, there is still little literature and study results about it. This study aims to report on the role of radiologic technology in enforcing the diagnosis of covid-19 disease handled by RSPAW Salatiga.

2. METHODS

The method used in this study is a descriptive-analytical report case, which is to observe patients from Emergency Departement (IGD) RSPAW Salatiga, then perform chest X-Ray examination. The X-ray results were then analyzed by a radiologist.

3. RESULTS AND DISCUSSION

Case 1

A male patient with complaints of fever, dry cough, shortness of breath. The result of a chest X-ray examination found typical pneumonia cardiomegaly of Covid-19. Other results in this patient found no pleural effusion, no pericardial effusion. The patient is a Covid-19 case with a positive SWAB result.

Case 2

A female patient with fever, dry cough, shortness of breath, and feeling nauseous in her stomach. The results of Chest X-Ray match the description of cardiomegaly, GGO (+), consolidation (+), thickening of the pleura, no pleural effusions, and no pericardial effusions was found.

Case 3

A 55-year-old female patient with a history of going out of town. Complaints submitted are fever, cough, and shortness of breath. The results of chest X-Ray match Covid-19 description that is bilateral pneumonia typical of Covid, GGO (+), Consolidation (+), reticular nodular (+), pleura thickening, and cardiomegaly were found. Another examination found no pelvic effusion and pericardial effusion.

Case 4

A 55-year-old female patient with history complaints of cough, fever, and shortness of breath. Chest X-Ray results found GGO (+), consolidation (+), crazy paving (+), cardiograph (+), pleural effusion (-), and pericardial effusion (-).
Discussion

The examination results of the chest X-ray carried out at RSPAW Salatiga matches the chest image of Covid-19. These results are in line with previous studies that the performance of chest X-ray diagnosis has a sensitivity of 89%. In diagnosing Covid-19 patients in cases 1 to 4, it was found GGO (+), consolidation (+), crazy paving, reticulonodular, location in the peripheral lung, and the inferior lobe of the lung. These results are supported by the specifications of experienced radiologists, thereby increasing accuracy over time as a first-line examination in suspected patients of Covid-19 (Cozzi et al., 2020).

These results also support other studies on the role of chest x-ray radiologic technology in helping to diagnose or determine the triage of Covid-19 (Brogan & Nickson, 2020; Jacobi, Chung, Bernheim, & Eber, 2020; Litmanovich et al., 2020; Sarkodie et al., 2020). The study results are in line with the statements of Yang et al. (2020) that radiological imaging has an important role in detecting lung lesions, stratification, evaluation of treatment strategies, and differentiation of mixed infection.

4. CONCLUSION

This study reported the radiographic characteristics of chest radiographs in Covid-19 patients at RSPAW Salatiga. Based on the previous description, it can be concluded that the pattern of Covid-19 lung disease can be identified on conventional radiographs chest X-ray. Chest X-ray technology has been proven to help diagnose Covid-19 using polymerase chain reaction (PCR).

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