Evaluation of CT Scan findings in heart failure patients with COVID-19 in Ardabil Imam Khomeini Hospital from March 2020 to March 2021

Abstract

Background: In December 2019, a sudden outbreak of pneumonia caused by severe acute respiratory syndrome coronavirus SARS-CoV2 occurred in Wuhan, China, known as coronavirus disease 2019 (COVID-19). This disease quickly spread throughout the world and became an epidemic. Our previous knowledge proved that viral infections such as influenza can be a trigger for disability and decompensation in patients with heart failure. Considering that there is very little information about covid-19 disease and related diseases such as people with a history of heart failure and in some cases conflicting results, we concluded in this study that in patients with covid-19 heart failure in Imam Khomeini Hospital, Ardabil, to evaluate the CT scan findings of the patients.

Aim: The purpose of this study is to evaluate CT Scan findings in HF patients with covid-19 and compare it between recovered and deceased patients in Ardabil Imam Khomeini Hospital from March 2018 to March 2019.

Materials and Methods: This study is an analytical cross-sectional study that was conducted from the beginning of March 2018 to the end of March 2019 in all HF patients with covid-19 hospitalized in Imam Khomeini (RA) hospital in Ardabil. The criteria for entering the study were all patients with HF whose real-time PCR test was positive in connection with the disease of covid-19 or people who were diagnosed with covid-19 based on the findings of the CT scan according to the national guidelines. For all the studied subjects, the questionnaire including demographic characteristics, CT scan findings was completed. Questionnaire information was collected and after entering into SPSS version 21 software, the results were analyzed using chi-square, t-test and ANOVA and were reported with $P < 0.05$.

Results: Among the 38 patients with HF who also had covid-19, 20 were women (52.6%) and 18 were men. The average age in the study group and in 38 HF patients with covid-19 was 70.4±12.9 years. The highest frequency of underlying diseases was related to heart infarction with 78.9%. Shortness of breath was the most frequent clinical symptom with a frequency of 92.1%. Among the 38 people included in the study, 27 (71.1%) patients recovered and 11 patients (28.9%) died. 86% (33 out of 38) patients had pulmonary involvement in radiological images. The most common radiological finding was ground glass with 86.8%. The extent of involvement in the lower part of the right and left lung was greater in women. In terms of the severity of the involvement, the intensity in the middle part of the right lung, the whole right and left lung was higher in women.

By examining the findings of the CT scan based on EF, it was found that the frequency of ground glass and lower lobe involvement was higher in EF above 50% and below 40%.

Conclusion: In general, the results of the current study indicate that the ground glass radiological finding is the most common finding. The mortality rate in patients hospitalized in ICU is significantly higher. Most of the patients had EF 40% or less and were in class 4 according to FC. In general, abnormal CT scan findings of the lung when accompanied by underlying diseases and increasing age of the patient are associated with increased disease severity and hospitalization in the intensive care unit and increased mortality. Therefore, it is thought that the mortality rate of these patients can be reduced by early identification of HF patients with covid, especially those who are old and have underlying diseases and abnormal CT scan findings and faster and better treatment and care of this group.

Keywords:HF˛COVID-19˛CT Scan findings