Fayoum university

Faculty of medicine

Critical care department

Outcome predictors for ICU Admitted Critically Ill Covid 19 patients in Fayoum University Hospitals

A thesis submitted for partial fulfillment of

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By

Hamada Ali Abd El Salam Abd El Latif

M. B. B. CH

Supervised by

Dr. Osama Mahmoud Momtaz

Assistant professor of Critical care Medicine

Dr. Ahmed Fathy Mohamed

Lecturer of Critical care Medicine

Dr. Abdelrahman Mohamed Yassin

Lecturer of Critical care Medicine

Fayoum University

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Summary

Covid were first set up during the 1960s and are called because of their crown- suchlike shape. In some cases, still not constantly, a Covid can beget complaint in the two brutes and people. A violent respiratory illness, brought about by a new Covid (serious violent respiratory condition Covid 2 or SARS- CoV- 2 lately known as 2019- nCoV) was honored as the reason for Covid sickness 2019(Coronavirus) as it spread in China and accordingly across the globe. SARS- CoV- 2 has a place with the β- Covid gathering and offers broad genomic character with club Covid indicating that batons are the normal host. SARS- CoV- 2 can use an analogous receptor, angiotensin- changing over catalyst 2(ACE2), as that for SARS- CoV, the Covid related with the SARS spread in 2003. It substantially spreads through the respiratory parcel with lymphopenia and cytokine storms occurring in the blood of people with extreme illness. **(Mortaz E, et al.2020)**

We aimed to evaluate clinical, laboratory and radiological parameters of the critically COVID-19 patients admitted in the ICU of Fayoum University Hospitals as well as therapeutic management and assess their impact as outcome predictors.

All patients are examined, and data collected within 24 hours of admission. All patients are subjected to the following:

(1) **Full medical history** as taken from all patients or their relatives with special emphasis to age, sex, onset of COVID-19 symptoms and progression, history of admission to an intermediate care unit before ICU admission, history of oxygen therapy and previous non-invasive or invasive ventilatory support or cardiopulmonary resuscitation before ICU admission, information about out-

patient medical therapy as the use of bronchodilator, inhaled or long-term oral steroid and

home oxygen as well as other co-morbidities. Patients with missed clinical data or ICU stay less than 24 hours were excluded from the study.

(2) Clinical examination including general examination as well as cardiac and chest examination and assessment of hemodynamic status.

(3) Arterial blood gases (ABG) analysis on admission and regularly as needed for patient diagnosis and follow up.

(4) Laboratory investigations including sputum examination and cultures, CBC (complete blood count including total and differential leucocytic counts and platelet count), D-dimer, coagulation profile (PT, PC, INR and PTT), CRP , LDH, serum ferritin , serum albumin, lipid profile including triglycerides, ALT (alanine aminotransferase), AST (aspartate aminotransferase), serum bilirubin , kidney function tests (urea, creatinine), blood sugar, serum electrolytes including Na, K and calcium as well as other laboratory investigations according to the patient condition. These parameters were done within 24 h of admission and reassessed regularly every 1-3 days as needed. IL6 assessment was done for suspected cases of cytokine storm and repeated as needed.

(5) Chest imaging by CT chest that is assessed for all cases:

The CT chest findings assessed included the presence of ground-glass opacification; consolidation; special CT chest signs such as crazy-paving, halo, and reversed halo signs; spiderweb appearance; subpleural sparing; interlobular septal thickening; intralobular septal thickening; parenchymal band; subpleural band; cyst; nodule; vascular thickening; bronchial thickening; pleural thickening; pleural reaction; pleural effusion; and reactive lymph nodes (exceeding 1 cm in short-axis diameter).

The CO-RADS classification is a standardized reporting system for patients with suspected COVID-19 infection developed for a moderate to high prevalence setting.

Based on the CT findings, the level of suspicion of COVID-19 infection is graded from very low or CO-RADS 1 up to very high or CO-RADS 5 and the severity and stage of the disease is determined with remarks on comorbidity and a differential diagnosis.

(6) Cardiac imaging by echocardiography for indicated cases such as: Myocardial infarction and pulmonary embolism, acute pulmonary edema, and shock.

(7) Acute physiology and chronic health evaluation (APACHE II).

All patients were evaluated according to the acute physiology and chronic health evaluation (APACHE II) scoring system at the time of admission. The APACHE II score contains three components: age, acute physiologic score (APS), and chronic health. The total APACHE II score ranges from 0 to 71. A higher score implies a less favorable prognosis. The APS includes physiologic variables and the Glasgow Coma Score (GCS). The 11 physiologic variables in the APS can contribute up to 4 points each. The patient's GCS can add a further 15 points. Immuno-compromised patients or those with severe organ system insufficiency receive 5 points for chronic health.

Policy of Oxygen therapy and Mechanical ventilation:

Oxygen therapy was modulated in every case according to the condition to target SO2 above 93% and not exceeding 95-96% aiming to achieve the lesser O2 supply and relieve dyspnea and hypoxemic symptoms and improve respiratory

acidosis. This is approached by low flow Oxygen therapy using nasal cannula, face mask or high flow O2 therapy using non-rebreathing (reservoir) mask at 15 L/min.

Non-invasive ventilation (NIV) using CPAP or BIPAP is used if high flow O2 using non-rebreathing mask cannot achieve the target. Alternating high flow Oxygen using non-rebreathing mask and NIV is used to alleviate respiratory muscle fatigue that occurs with prolonged NIV therapy and achieve SO2 target that cannot be reached by non-rebreathing mask alone.

Invasive mechanical ventilation was urgently applied if one of these criteria occurs at presentation or during Oxygen therapy using NIV alternating with high flow O2:

(1) respiratory pauses or apnea with gasping for air.

(2) deteriorating conscious level due to respiratory acidosis or imminent respiratory arrest.

(3) severe hemodynamic compromise.

(4) inability of lower airway protection or copious secretions.

Patients were followed until ICU discharge or demise. Various pre-hospital and in-hospital comparative parameters in survivors and non-survivors were assessed in all studied patients.

The study identified several possible factors that were associated with poor outcomes in critically ill patients with COVID-19 and our findings revealed that patients with COVID 19 admitted in ICU should be monitored carefully in multiple parameters and variables as : demographic data and vital signs and clinical and laboratory findings and treatment lines and we concluded that age and weight and laboratory findings as LDH and IL-6, hypoalbuminemia, hypocalcemia,

leukocytosis, elevated ferritin, CRP, D dimer, scores as CORADS and APACHE II scores, clinical findings as number of affected lung lobes were significant predictors for outcome in patients with COVID 19 admitted in our ICU.

We recommended that all COVID19 patients should be evaluated in a meticulous manner by variables we used as: demographic data and vital signs and clinical and laboratory findings and treatment lines which were beneficial predictors for outcome in these patients and we also recommended further studies in larger numbers and more available variables to predict the outcome of the disease.