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THE IMPACT OF COVID-19 ON CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A CASE REPORT

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The authors declare that they have no conflict of interest.

ABSTRACT

We report a case of a 50 years old man with typical clinical picture of SARS-CoV-2 infection that was admitted to Emergency Department at Assisi Hospital.

We discuss the clinical scenario, the clinical course of the patient and the therapy that was administered in Intensive Care Unit.

INTRODUCTION

In December 2019, many patients with pneumonia of unknown cause and with atypical clinical features were diagnosed in Hubei, China.

This clinical scenario was related to a novel pathogen that was identified as an acute respiratory infectious disease virus belonging to coronavirus family and that was named COVID-19 (CORonaVirus Disease-19) by the World Health Organization (WHO) on 11 February 2020.

This virus quickly spread throughout the world in many countries.

Data about the real prevalence of infection and disease related to COVID-19 infection are controversial.

According to official data from Italian National Institute of Health to date 26th of march 2020 the

fatality rate related to the virus would reach 9.2% in Italy with 73780 infected individuals and 6801 deaths⁽²⁾.

According to Centre for Evidence-Based Medicine of Oxford, based on www.worldometers.info, data the COVID-19 fatality rate would reach 10.09% in Italy⁽³⁾.

In a paper by Onder G et al. case-fatality rate is estimated 7.2% to 17th march 2020 in Italy, and the authors hypothesis is that such higher rate, compared to other countries, could be related to three factors: the overall older age distribution in Italy, the presence of comorbidities in Italian population and the differing strategies used for SARS-CoV-2 reverse transcriptase polymerase chain reaction testing (RT-PCR).

In the same article the Chinese case-fatality rate reported is 2,3%, according to data derived from Chinese Center for Disease Control and Prevention⁽⁴⁾.

In a paper by Baud et al. according to World Health Organization data on the cumulative overall number of deaths to March 1, 2020, mortality rates would be 5-6% (95% CI 5.4-5.8) for China and 15.2% (12.5-17.9) outside of China⁽⁵⁾.

CASE REPORT

A 50-year-old man was admitted to the emergency room of Assisi Hospital on the 5th of March 2020, for a clinical picture characterized by dyspnea, cough, fever, over the previous 2 weeks.

In his past clinical history, the patient reported systemic hypertension and long term smoking habit (10 cigarettes per day). The patient did not report taking any medication drugs in his past. The patient's father died from myocardial infarction.

At admission in the emergency department, the clinical examination revealed fever (body temperature: 38°C), marked reduction of breath sounds and fine basilar and mid-lung crackles, no evidence of heart murmurs and no relevant abdominal findings. Blood pressure was 165/85 mmHg, and SpO₂ was 90% breathing room air. The electrocardiogram showed sinus tachycardia with heart rate of 100 bpm.

Laboratory exams revealed mild leukopenia (white blood cell count $<3.5 \times 1000$ cell/mm³) with lymphopenia (lymphocyte count $<1.1 \times 1000$ cell/mm³) and Protein-C-Reactive markedly increased (78 mg/dl).

A chest X-ray was performed that revealed increased bilateral interstitial markings described by the radiologist as an increased, thickened, and reticular pattern in the mid and lower fields of the lungs. No pleural effusion was found.

A deeper interrogation of the patient revealed that he travelled in the region Lombardia in the previous 10 days. That region was labelled as "high risk" area for COVID-19 infection in the previous

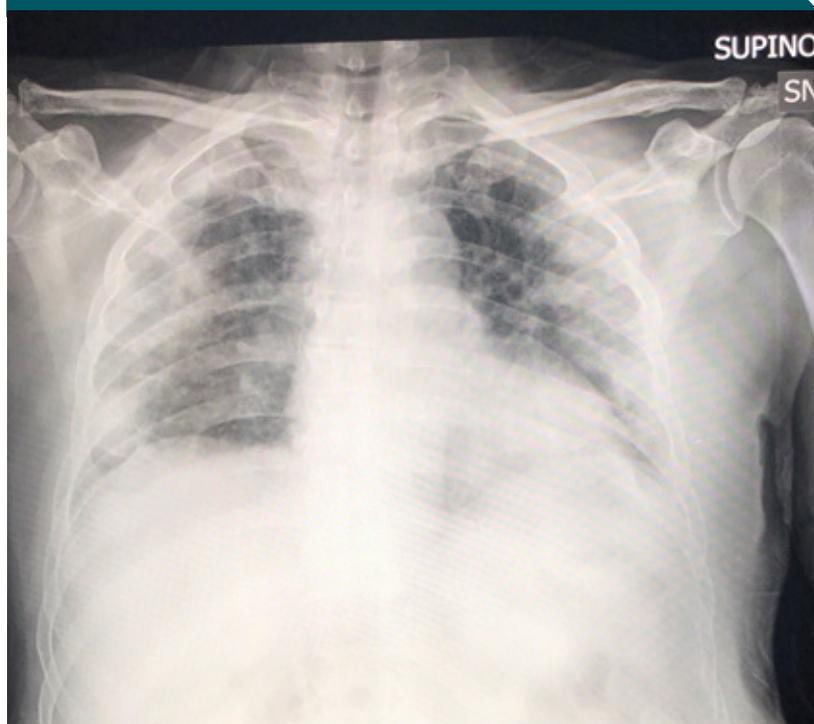
weeks.

Our healthcare professionals, foreseeing the potential risk of infection, picked up and managed the patient wearing advanced biosafety personal protection equipment (PPE).

The patient underwent COVID-19 diagnostic swab that resulted positive for infection (RT-PCR test).

FIG. 1: CHEST X-RAY

BILATERAL INTERSTITIAL MARKINGS; INCREASED, THICKENED, AND RETICULAR PATTERN IN THE MID AND LOWER FIELDS OF THE LUNGS.



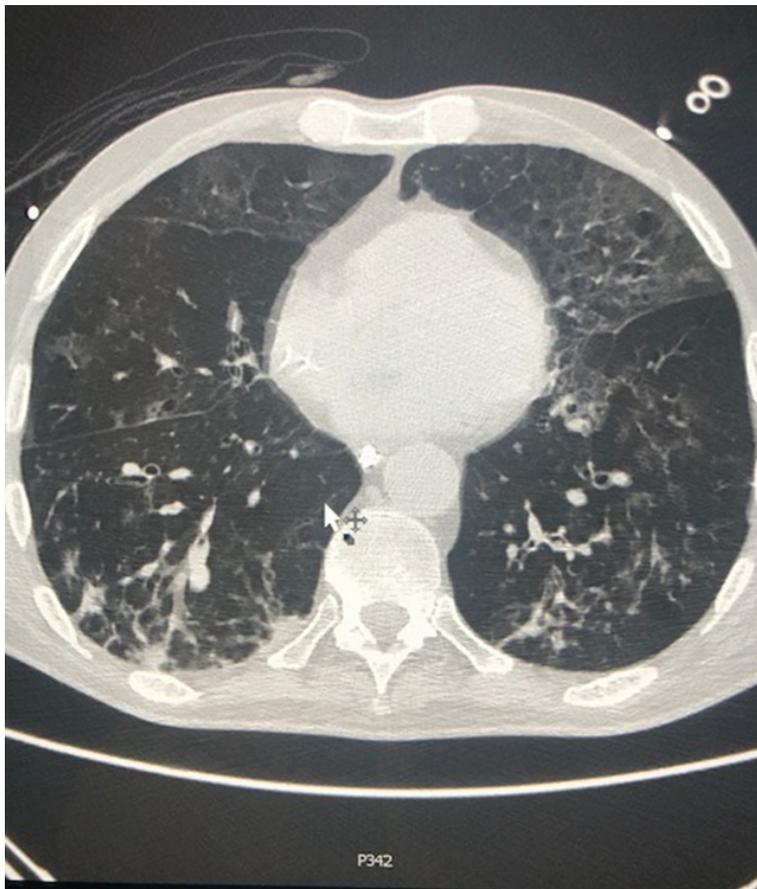
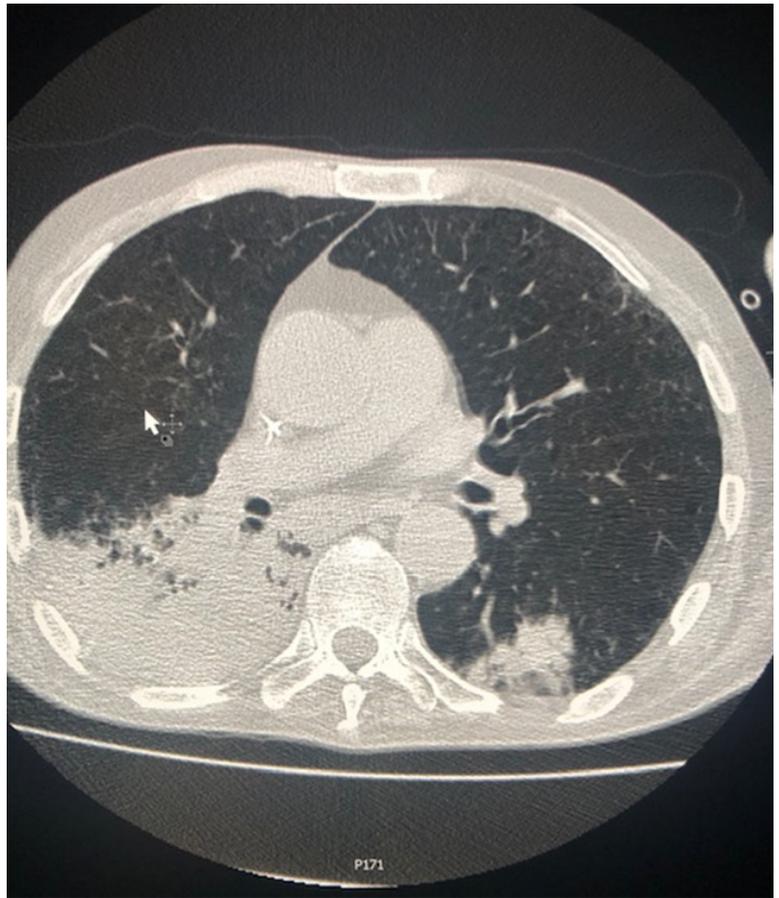
The patient was then transported to infectious disease ward at hub referral hospital with a clinical picture of acute respiratory distress syndrome (ARDS).

The patient was then admitted to intensive care unit. In ICU the patient was treated with administration of lopinavir/ritonavir 200/50 mg 2 doses bid and chloroquine 500 mg 1 dose bid.

The patient was initially treated with non-invasive ventilation and continuous positive airway pressure (CPAP) standard device but after the first 48 hours, due to a complete lack of clinical response, the patient underwent orotracheal intubation.

The patient was also administered a first dose of tocilizumab.

The patient underwent thoracic High Resolution Computerized Tomography (HRCT) scan that revealed “crazy paving” and “ground-glass” opacities bilaterally in middle e upper fields of the lungs with superimposed interlobular septal thickening and intralobular septal thickening, and in the dorsal right inferior lung field the presence of pulmonary consolidation with clear evidence of air-bronchograms; similar findings, but less evident, was shown in left inferior lower lung field.



No pulmonary or cardiac effusion was detected (FIG. 2).

All the recent contacts of the patient were traced back and underwent COVID-19 diagnosis swab: 6 subjects were confirmed as carrier of infection though asymptomatic or with mild symptoms.

Although all the therapeutic efforts made, the patient died with severe respiratory and heart failure on the 5th day from admission.

FIG. 2: CHEST CT SCAN

“crazy paving” and “ground-glass” opacities bilaterally in middle e upper fields of the lungs with superimposed interlobular septal thickening and intralobular septal thickening; in the dorsal right inferior lung field presence of pulmonary consolidation with clear evidence of air-bronchograms; similar findings, but less evident, in left inferior lower lung field.

DISCUSSION

In this article we report a case of a poor prognosis patient affected by ARDS that did not recover from SARS-CoV-2 respiratory infection despite a prompt therapeutic approach with antiretroviral drugs and cloroquine.

To date, no proven specific 100% performing antiviral drug therapy for COVID-19 is established.

The treatment is exclusively symptomatic and aimed to support vital parameters; in case of severe clinical scenarios, intensive care medical treatment including mechanical ventilation and Extra Corporeal Membrane Oxygenation (ECMO) therapy can be considered.

Many antiviral schemes have been proposed by scientific community mainly based on the use of antiviral drugs and cloroquine.

Some trials are actually ongoing to prove the efficacy of these therapeutic strategies⁽⁶⁾.

The cardinal radiological CT scan signs are ground glass opacities, consolidation and crazy paving pattern.

The majority of cases show multifocal, bilateral involvement of the lungs. RT-PCR is pivotal in confirming the diagnosis and is still the gold standard to test the presence of COVID-19 infection.

Tocilizumab is a promising drug in treatment of COVID 19 diseases in patients with severe illness and risk of cytokine storms⁽⁷⁾ but to date no robust data are available and large enough to support a specific and uniform therapeutic approach to COVID-19 infected patients.

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