Severe acute respiratory disease in a young man with COVID-19 infection

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Section: Chest imaging
Area of Interest: Lung
Imaging Technique: CT
Special Focus: Infection Case Type: Clinical Cases
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Patient: 34 years, male

Clinical History:

A previously healthy 34-year-old man presented to the emergency department with a 7-day history of high fever, dry cough and dyspnoea. Laboratory tests showed elevation of C-reactive protein (45 mg/L), while white cell count was normal.

Imaging Findings:

Chest X-ray performed on admission showed only a small opacity in the right upper perihilar region (Fig. 1).

Chest CT performed two hours later, due to worsening of patient conditions, showed diffuse bilateral patchy ground-glass opacities, with both subpleural and central distribution (Fig. 2); some pulmonary consolidations were also present in posterior basal segments of the lower lobes (Fig. 3). There was no lung effusion nor mediastinal lymph node-enlargement.

Discussion:

At the end of 2019 a novel coronavirus was identified as the cause of a cluster of pneumonias in Wuhan (China). It rapidly spread throughout China, followed by an increasing number of cases in other countries. In February 2020, the World Health Organization designated the disease COVID-19 (coronavirus disease-2019) [1].

The incubation period for COVID-19 is thought to be within 14 days, with most cases occurring approximately 4 days after exposure. Common symptoms include fever, dry cough and shortness of breath; other symptoms include fatigue, headache, sore throat and haemoptysis. Older patients with comorbidities are more likely to develop respiratory failure due to severe alveolar damage. Lymphopenia is a common finding in laboratory tests [1-2].

Radiological examinations are of great importance in the detection of the disease. Chest X-ray is not sensitive in the early stages of the infection and could miss some manifestations of the disease, which are otherwise evident on CT. Typical CT findings include multifocal bilateral ground-glass opacities associated with patchy consolidation, with predominant subpleural distribution and posterior part or lower lobe predilection. Pleural effusion and mediastinal lymph nodes enlargement are rarely reported. CT can also assess the disease severity to guide clinical management and it’s useful in follow-up [3-4].
The final diagnosis is confirmed by a positive RT-PCR assay for COVID-19, using respiratory samples (usually nasopharyngeal or throat swabs). RT-PCR remains the reference standard for the diagnosis, but its results can be affected by sampling errors and low virus load [2].

The patient developed respiratory failure and was transferred to the intensive care unit. He recovered well and was discharged after three weeks after admission with complete resolution of symptoms and negative COVID-19 swab.

Take home message

Chest CT has an important diagnostic role in COVID-19 infection, especially when confirmatory tests, such as the RT-PCR, are unavailable or undetermined.

Written informed patient consent for publication has been obtained.

Differential Diagnosis List: COVID-19 pneumonia, Bacterial pneumonia, Acute respiratory distress syndrome (ARDS)

Final Diagnosis: COVID-19 pneumonia

References:


Figure 1

Description: Chest X-ray shows a small opacity in the right upper perihilar region. Origin: Department of Radiology, Ospedale di Cattinara, Trieste, Italy.
Description: Chest CT, axial (a-c) and coronal (d) views, shows multifocal bilateral ground-glass opacities

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