

Patient with COVID-19 who has no specific onset symptoms and progresses rapidly to death: a case report

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Case Report

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Abstract

Background

Since its outbreak, COVID-19 has continued to spread rapidly more than 3 months, which constituted a public health emergence worldwide.

The onset symptoms of patients with COVID-19 are not specific, especially in non-respiratory symptoms, it is easy to be ignored, which can cause widespread infection. For critically ill patients, glucocorticoids are used for anti-inflammatory treatment. However, after the application cycle recommended by the guidelines, the deterioration of the patient's condition and treatment to suppress cytokine storms is more critical.

Case presentation

A previous patient was admitted to the hospital due to abdominal pain and diarrhea, and accidentally was confirmed with positive SARS-CoV-2. The patient progressed rapidly from mild to severe within 2 days of admission. With timely anti-viral and anti-inflammatory drugs and early ventilator respiratory support, the patient's condition improved temporarily, and subsequently accompanied by a decrease in glucocorticoids, the patient's condition worsened and eventually died. Her family members were also hospitalized due to close contact.

Conclusion

This case highlights that even if glucocorticoids are discontinued in accordance with the guidelines, deterioration of the patient's condition is inevitable attribute to the cytokine storms. And related Chinese and western medicines that suppress cytokine storms should be applied in time. In addition, more systematic epidemiological surveillance and stool tests are necessary due to potential lethal risk and route of transmission.

Introduction

On March 11, the [World Health Organization](#) had officially announced that [Corona Virus Disease 2019 \(COVID-19\)](#) can be characterized as a pandemic, which revealed the epidemic escalation. As of March 26, the number of confirmed cases worldwide reached 41,6686, of which 18,589 were fatal cases, covering 196 countries or regions. (1) Previous research had reported that fever and cough were the most common symptoms of in the course of illness. However, this patient with COVID-19 went to hospital for abdominal pain and diarrhea. She was accompanied by low body temperature and mild cough symptoms during the entire course. According to the guidelines, reduce the use of glucocorticoids after 7 days, the patient's condition rapidly deteriorated and eventually died. Her family's infection does not rule out the possibility of fecal transmission, as patients have been complaining of diarrhea

Case Presentation

On 27 January 2020, a 62-year-old-woman went to the hospital for diarrhea and abdominal pain without fever or cough. She was only diagnosed with colitis and mild hypertension with blood oxygen saturation (SaO_2) of 80%. A chest CT examination is required for epidemiological screening which showed that the predominant pattern was bilateral lung involvement, ground-glass opacity with ill-defined margins. With a nasopharyngeal swab test for confirming, she was transferred to infectious disease hospital. Her vital signs were normal on admission only with diarrhea and abdominal pain accompanied by black loose stool without fever. The clinical symptom and laboratory tests from admission to death are presented in Figure 1 and Additional file 1 respectively.

At 14:12 on 4 February, the patient had chest tightness and asthma. Chest CT showed multifocal and ground-glass opacification in both lungs.

Though symptomatic supportive therapy was administered, the patient's condition was aggravated increasingly. Consultation blood gas analysis showed acidosis and hypokalemia with 60 mmHg arterial oxygen tension (PaO_2). Give methylprednisolone sodium succinate 40mg intravenously as anti-inflammatory treatment for the first time. To prevent respiratory failure, the patient was moved to the **Intensive Care Unit (ICU)** with noninvasive ventilator to assist breathing. Intravenous infusion of methylprednisolone sodium succinate and atomization of budesonide aerosol are used for anti-inflammatory, moxifloxacin for antibacterial, oral antiviral drugs and other nutritional support symptomatic treatment.

At 10:35 on 6 February 2020, the patient had a shortness of breath with 40 breaths/min, SaO_2 of 91%, and plasma potassium concentration of 2.6 mmol. Chest X-ray (Figure.2A) showed bilateral lower lobes most severely affected. Doxofylline injection was used to relieve cough and asthma and human immunoglobulin injection to enhance antiviral effect. The vital signs were closely monitored and the dyspnea lasted for three days until 10 February and glucocorticoids are gradually reduced after 7 days of application. Chest X-ray (Figure2B) showed a decrease image and signs were basically stable. We flexibly adjusted the autonomic breathing parameters of the ventilator and reduce the dosage of methylprednisolone gradually. The rest symptomatic treatment was the same as before.

However, the patient got a fever of 37.5°C in the morning On February 14, 2020. At night, she recurred dyspnea with the frequency of 45/min, and the SaO_2 of 60%–75%. The next day, though the patient had a clear mind, noninvasive ventilation did not ease the difficulty of oxygenation. Endotracheal intubation was performed and the ventilator was connected to support her breathing and patient was sedated and analgesic. Vital signs are temporarily normal. Right femoral vein catheterization was performed for invasive BP monitoring. After high parameter support and high concentration oxygen supply, the SaO_2 still fluctuated in the range of 60%–75%. Prompt treatment and urgent examinations was given to face the disease progression. On February 16, 2020, chest X-ray (Figure2C) examination showed lesions deterioration with larger diffuse distribution compared with the last one. **The next day, she was ventilated**

in prone position in a state of sedation and analgesia. Physical examination revealed deep coma though noradrenaline was continuously pumped intravenously. She continued to have respiratory failure and shock. On February 18, 2020, the patient had a sudden drop-in heart rate at 01:00. Endotracheal intubation and continuous ventilator assisted respiration in **Synchronized Intermittent Mandatory Ventilation (SIMV)** mode was conducted. Her condition deteriorated at 07:10 with ventricular fibrillation, so adrenaline and electric defibrillation was performed for cardiopulmonary resuscitation. At 07:30, the patient was dead finally.

Discussion

This patient has a relatively younger age with diarrhea and abdominal pain as the first major symptoms, which can easily be ignored and misdiagnosed as acute gastroenteritis causing a wider range of exposure. Her symptoms of diarrhea and abdominal pain were quickly controlled due to antiviral and antibacterial applications. However, the pulmonary infection was serious, and hypoxia developed rapidly though oxygen-inhalation continues. To reduce the inflammatory exudation of pulmonary interstitium, methylprednisolone was used and the symptoms were slightly controlled on the 9th day of her hospitalization. Following the guidelines, we gradually reduced the level of glucocorticoid after 7 days of application. (2) However, the patient's condition deteriorated rapidly until death after reduction. The treatment of glucocorticoids in critically ill patients was controversial, and previous articles have even indicated the risks of applications in patients with severe acute respiratory syndrome (SARS) and acute respiratory distress syndrome (ARDS). (3, 4) The transition from first symptoms to ARDS is highly likely to be the uncontrolled cytokine release. The occurrence of cytokine storm is closely related to the severity and lethality of viral infection, and it is one of the important mechanisms for the occurrence and deterioration of COVID-19. Cytokine storm, also called inflammatory storm, is an important cause of ARDS and multiple organ failure in patients with viral infection. (5) (6) A previous research demonstrated that, from December 16, 2019 to January 2, 2020, one-third of the first 41 confirmed cases of COVID-19 patients developed ARDS (29%, 12 cases) or received intensive care (32%, 13 cases) in Wuhan, which cytokine storms were detected obviously in severe patients. (7) Recent autopsy report analysis found that inflammatory storms are very common. The transformation between classical activated macrophages and alternative activated macrophages may be an important cause of lung inflammation and fibrosis. (8) Therefore, reasonable application of glucocorticoids and effective measures to deal with the severe cytokine storm after drug reduction are significant for severe patients. For example, extracorporeal membrane oxygenation can be used as supportive treatment for critically ill patients with the attention about the number of lymphocytes and interleukin-6. (9) Hydroxychloroquine is likely to attenuate the severe progression of COVID-19, inhibiting the cytokine storm by suppressing T cell activation. (10) Combined treatment of severely ill patients with recovery antiviral plasma and suppression of inflammatory factor storms with effective Chinese medicine have been incorporated into the latest national diagnosis and treatment protocol. (11) Considering the patient's obviously digestive system symptoms, her family is most likely infected through fecal-oral transmission, after all, coronavirus has been proven to be easily transmitted through aerosols. (12) And a reported had proved that the rectal

swab specimens can be tested positive even nasopharyngeal swab has turned negative. (13) Given such a case with an atypical first symptom and analyzed her diagnosis and treatments, we suggest that (1) Concerned about the rebound of the patient's condition after glucocorticoid reduction, and exploring measures to suppress cytokine storms, thereby reducing inflammatory lung injury and protecting organ function, is of great significance for severe and critically ill patients with COVID-19. (2) Epidemiological screening and surveillance should be strict. Even asymptomatic patients may deteriorate rapidly, and stool testing should be taken into consideration, as the potential risk of infection is unavoidable.

Abbreviations

COVID-19: Corona Virus Disease 2019, ICU: Intensive Care Unit, SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus2, SIMV: Synchronized Intermittent Mandatory Ventilation.

Declaration

Ethics approval and consent to participate

Not applicable

Consent for publication

Written informed consent for publication of their clinical details and clinical images was obtained from the Patient's husband. A copy of the consent form has been provided as an "Additional file 2", which is available for review by the Editor of this journal.

Availability of data and materials

Not applicable

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

SZ drafted the manuscripts and planned this report. WC contributed to data collection and participated in the critical revision of the manuscript. CZ contributed to the literature search and data interpretation. XF manage the editing of figures, tables and the article review.

LF also participated in drafting the manuscript and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the article are appropriately investigated and resolved. All the authors have read and approved the final manuscript.

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Figures



Figure 1

Symptoms and Maximum Body Temperatures from Day of Illness to death, January 24 to February 18, 2020.

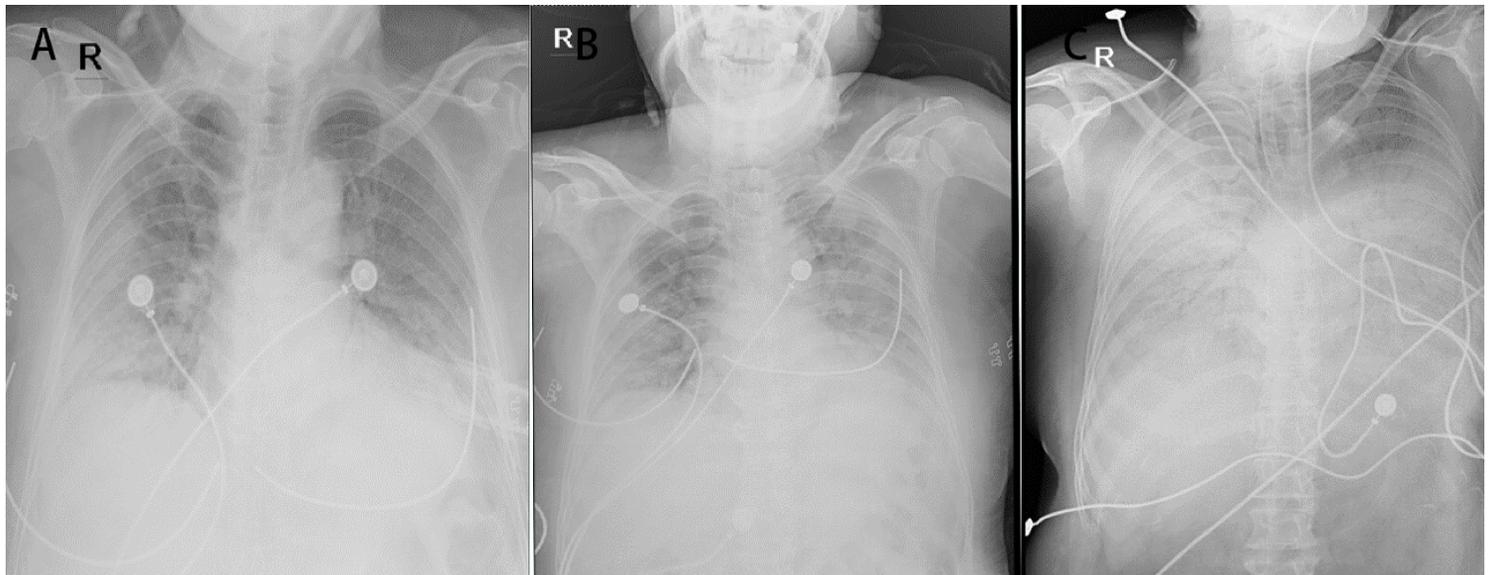


Figure 2

Figure. 2A Chest X-ray, February 8, 2020 (Illness Day 16, Hospital Day 8) showed the bilateral lower lobes most severely affected; Figure .2B Chest X-ray, February 11, 2020 (Illness Day 19, Hospital Day 10) showed ground-glass opacities decreased compared with image A; Figure. 2C Chest X-ray, February 16, 2020 (Illness Day 24, Hospital Day 15) showed lesions deterioration with larger diffuse distribution compared with image A. Figure. 2A Chest X-ray, February 8, 2020 (Illness Day 16, Hospital Day 8) showed the bilateral lower lobes most severely affected; Figure .2B Chest X-ray, February 11, 2020 (Illness Day 19, Hospital Day 10) showed ground-glass opacities decreased compared with image A; Figure. 2C Chest X-ray, February 16, 2020 (Illness Day 24, Hospital Day 15) showed lesions deterioration with larger diffuse distribution compared with image A.

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