COVID-19 in Elderly Patient: A Case Report

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SUBJECT AREAS

Infectious Diseases

KEYWORDS

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Abstract

Background: Coronavirus Disease 2019 (COVID-19) outbroke in Wuhan, China in December 2019 and spread rapidly. Elderly patients with COVID-19 are more likely to develop into severe type, but little related experience has been introduced.

Case presentation: An 82-year-old female patient living in Wuhan, China was referred because of fever, dry cough and chest distress for a week. Clinical diagnosis of COVID-19 was considered, confirmed by viral nucleic acid detection. For her poor nutritional status and deteriorated hypoalbuminemia, intact protein enteral nutrition powder was added and albumin was supplemented besides the antiviral therapy. Her fever gradually subsided with the alleviation of related symptoms. During her hospitalization, D-dimer level elevated with ultrasonographically detected thromboembolism in bilateral gastrocnemius veins, and low molecular weight heparin was thereby administrated for the prevention of pulmonary embolism.

Conclusions: The experience of this case suggested that the timely screening and intervention of malnutrition and venous thromboembolism are crucial issues to be concerned when treating elderly patients with severe COVID-19 besides the routine antiviral therapy.

Background

Coronavirus Disease 2019 (COVID–19) outbroke in Wuhan, China in December 2019 and spread rapidly to other areas. As of March 2, 2020, 81 021 COVID–19 cases in China and 61 518 cases in other 134 countries have been reported [1]. According to the Chinese Center for Disease Control and Prevention, the overall case-fatality rate (CFR) of COVID–19 was 2.3% but the CFR for patients aged 80 years or older reached 14.8% [2]. Also, the severe cases who were admitted to intensive care unit were significantly older than the non-severe ones [3, 4]. However, less clinical experience regarding to the elderly patients with COVID–19 has been mentioned. We report here the detailed clinical course of an 82-year-old case with severe COVID–19 who recovered after treatment.

Case Presentation

An 82-year-old female patient was referred to the Center Theater General Hospital of PLA on February 5, 2020 (day 1, the timeline of events is shown in Table 1) because of fever, dry cough and chest distress for a week. Other symptoms such as weakness, malaise, anorexia and insomnia were

associated, and she had a previous history of hypertension and chronic pharyngitis. Laboratory examination revealed hyperleukocytosis (11.28G/L), hyperneutrophilia (91.8%) and hypolymphemia (0.52G/L) with an elevated inflammatory status (C-reactive protein, CRP 229.15mg/ml). Chest computerized tomography (CT) scan showed bilateral subsegmental opacities and patchy consolidation (Fig 1). With regard to the contact history with COVID–19 patients at home, the clinical diagnosis of pneumonia caused by 2019 novel coronavirus (2019-nCoV) was considered and antiviral therapy with oseltamivir and moxifloxacin was given. However, her disease deteriorated in 2 days and she was consequently transferred to our Wuhan General Hospital.

Table 1

Timeline

Day	Event
Day 1	Admitted for fever, dry cough and chest distress for a week; chest CT shown in Fig. 1a; treated with os moxifloxacin;
Day 3	Transferred to our hospital with dyspnea, SaO_2 = 83%; viral nucleic acid detection reported: 2019 radiology shown in Fig. 1b; noninvasive ventilator employed; intact protein enteral nutrition pow regimen besides antiviral therapy
Day 5	fever reached 39.0℃; albumin = 24.2 G/L and prealbumin = 44.8G/L;
Day 6	Albumin (35g IV) supplemented
Day 8	D-dimer = 6.35μg/ml; ultrasonography: thromboembolism in bilateral gastrocnemius veins; LMWH twice a day) started
Day 9	Albumin (20g IV) supplemented
Day 12	Fever controlled under 37℃; dyspnea relieved
Day 14	noninvasive ventilator withdrawn
Day 16	Viral nucleic acid detection of 2019-nCoV: negative
Day 17	Alleviation of pulmonary infiltration indicated by chest radiology (Fig. 1c)
Day 18	Viral nucleic acid detection of 2019-nCoV: negative; D-dimer = 1.01μg/ml, fibrinogen = 4.35G/L
Day 19	Discharged from hospital

CT: computerized tomography; 2019-nCoV: 2019 novel coronavirus; IV: intravenous; LMWH: low molecular weight heparin

At the admission on Feb 7 (day 3), she presented dyspnea with a SaO_2 of 83% in room air with a temperature of 38.8℃. The positive result in viral nucleic acid detection confirmed her infection of 2019-nCoV. Additional laboratory findings showed elevated liver enzyme (aspartate aminotransferase 96G/L; alanine aminotransferase 79G/L), mildly decreased albumin (32.2G/L) and prealbumin (86.4 G/L), and increased level of D-dimer (1.56μg/ml) and fibrinogen (7.44G/L). Diffuse infiltrates over bilateral pulmonary lobes were shown in chest radiology (Fig 1). Noninvasive ventilator was applied with continuous positive airway pressure mode (inspiratory positive airway pressure 6cmH_2O). The

patient was prescribed with arbidol hydrochloride (0.2g, three times a day) and moxifloxacin (0.4g, three times a day) for antiviral therapy and in view of the potential concurrent infection, cefoperazone was added to her regimen. Thymosin (30m, three times a day) was also given for improving the immune function. Because of her poor nutritional status (NRS2002 score = 5), intact protein enteral nutrition powder (40g, three times a day) was given; milk and soymilk were also recommended for drinking. Her fever reached 39.0℃ on day 5 with a further decreased albumin (24.2 G/L) and prealbumin (44.8G/L), and consequently albumin was supplemented intravenously on day 6 (35g) and day 9 (20g). From day 7 to day 13, her fever subsided, ranging from 36.2℃ to 37.5℃, and the symptom of dyspnea relieved. Her temperature has been controlled under 37℃ since day 12, and noninvasive ventilator was withdrawn on day 14. Chest radiology on day 17 indicated the alleviation of pulmonary infiltration. Negative results were shown in the viral nucleic acid detections on day 16 and day 18, and she was discharged from our hospital on day 19, transferring to the designated area in her community for a 14-day isolation.

Notably, during the hospitalization, D-dimer level of the patient increased significantly to 6.35μg/ml on day 8, indicating the potentially deteriorated blood hypercoagulation. The following ultrasonographic examination showed thromboembolism in bilateral gastrocnemius veins. She presented neither the symptom of dyspnea nor the decrease of SaO_2 and pulmonary embolism (PE) was excluded by computed tomography pulmonary angiography. Low molecular weight heparin (LMWH, 4000IU, twice a day) was put on her regimen and physiotherapy of keeping the lower limbs elevated was suggested. Her D-dimer level reduced to 1.01μg/ml and fibrinogen reduced to 4.35G/L on day 18. Rivaroxaban was suggested to take for 3 months after dischargement with the routine examination of coagulation indicators.

Discussion And Conclusion

We report an elderly case with severe pneumonia caused by the infection of 2019-nCoV. Elderly patients with COVID–19 are more likely to develop into severe type with unfavorable prognosis. Attention is usually paid to their poor general condition and multiple comorbidities, but venous thromboembolism (VTE) and nutritional status are sometimes ignored. The experience in this case

suggested that VTE and malnutrition are also closely linked with the prognosis of elderly patients, which needs to be alerted.

In the treatment of COVID–19, oxygenation index and inflammatory markers usually receive more concern than coagulation indicators. However, because of the advanced age, restricted movement and infection, elderly patients with severe COVID–19 have a great probability to develop VTE that contains the deep vein thrombosis (DVT) and the life-threatening pulmonary embolism (PE) [5, 6]. As for this patient, a Caprini score of 5 confirmed the high risk of VTE. Her D-dimer level reached 6.35μg/ml on day 6 and the thrombus in both gastrocnemius veins was detected in ultrasonographic examination. Just as this patient who did not present the symptom of DVT such as palpable pain or edema in lower limbs, most of the VTE cases are asymptomatic [7], so the effective screening of VTE is especially important. D-dimer is a highly sensitive indicator for the activation of coagulation and fibrinolysis [8], and daily measurement of this indicator was suggested to be useful for screening VTE in emergency ICU patients[9]. Therefore, the dynamic monitoring of D-dimer and other coagulation indicators is crucial for elderly COVID–19 patients during their hospitalization in order to timely detect and prevent DVT and PE.

Nutritional condition is also closely associated with the mortality and prognosis of critically ill patients [10]; considering that elderly cases are more susceptible and more vulnerable to malnutrition [11], nutritional adjustment is especially important for them. For this patient, during her admission in our department, she was in a high nutritional risk with a NRS2002 score of 5. Nutritional evaluation suggested a daily energy requirement of 1400~1680kcal for her (25~30 kcal/kg/d) [12], but her initial daily intake only reached about 60% of the criteria due to anorexia. Therefore, intact protein enteral nutrition powder (providing 558 kcal daily) was given to fill the nutritional gap. Daily drinking of milk and soymilk was also advised to supply extra protein and energy. Given that no definitely effective drug for COVID–19 is available, the adjustment of malnutrition contributed significantly to the recovery of this patient by improving the function of immune system [13].

In conclusion, besides antiviral therapy and treatment for coinfection, the timely screening and intervention of VTE and malnutrition are also crucial issues to be concerned when treating elderly

patients with severe COVID–19. Future studies are required to evaluate the effectiveness of different nutritional plans and to formulate more specific recommendation for anticoagulation therapy during the treatment of COVID–19.

Abbreviations

COVID–19: Coronavirus Disease 2019, CFR: case-fatality rate, CRP: C-reactive protein, CT: computerized tomography, 2019-nCoV: 2019 novel coronavirus, LMWH: low molecular weight heparin, VTE: venous thromboembolism, DVT: deep vein thrombosis, PE: pulmonary embolism.

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Ethical Committee of the First Hospital of China Medical University, and the study complied with the principles of the *Declaration of Helsinki (1964)*. The patient received detailed information about the study, and the written informed consents was signed.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Competing Interests

The authors declare no conflict of interest.

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Author Contributions

ZQ: diagnosis, analysis, patient care and initial manuscript drafting. XW: diagnosis, analysis, literature research and initial manuscript drafting. WW: diagnosis, analysis, and manuscript revision. All authors read and approved the final manuscript.

Availability of data and materials

Not applicable.

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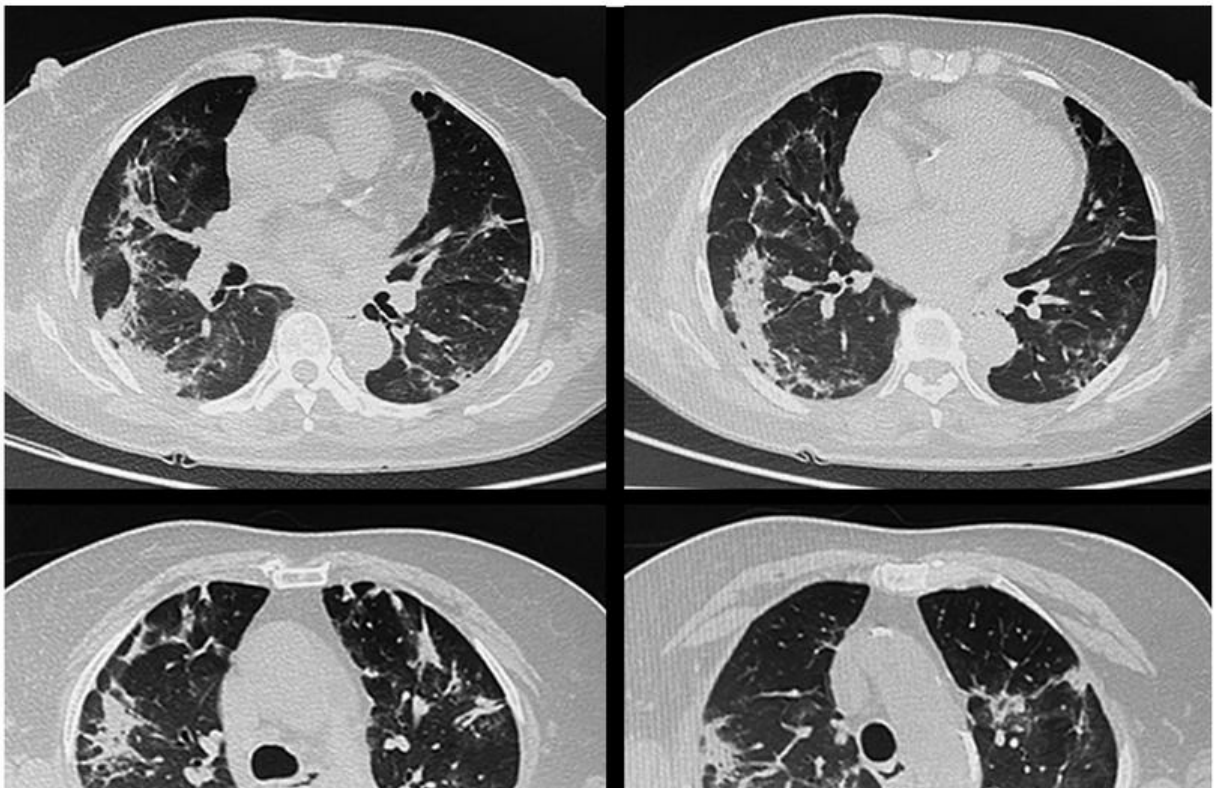
Figures



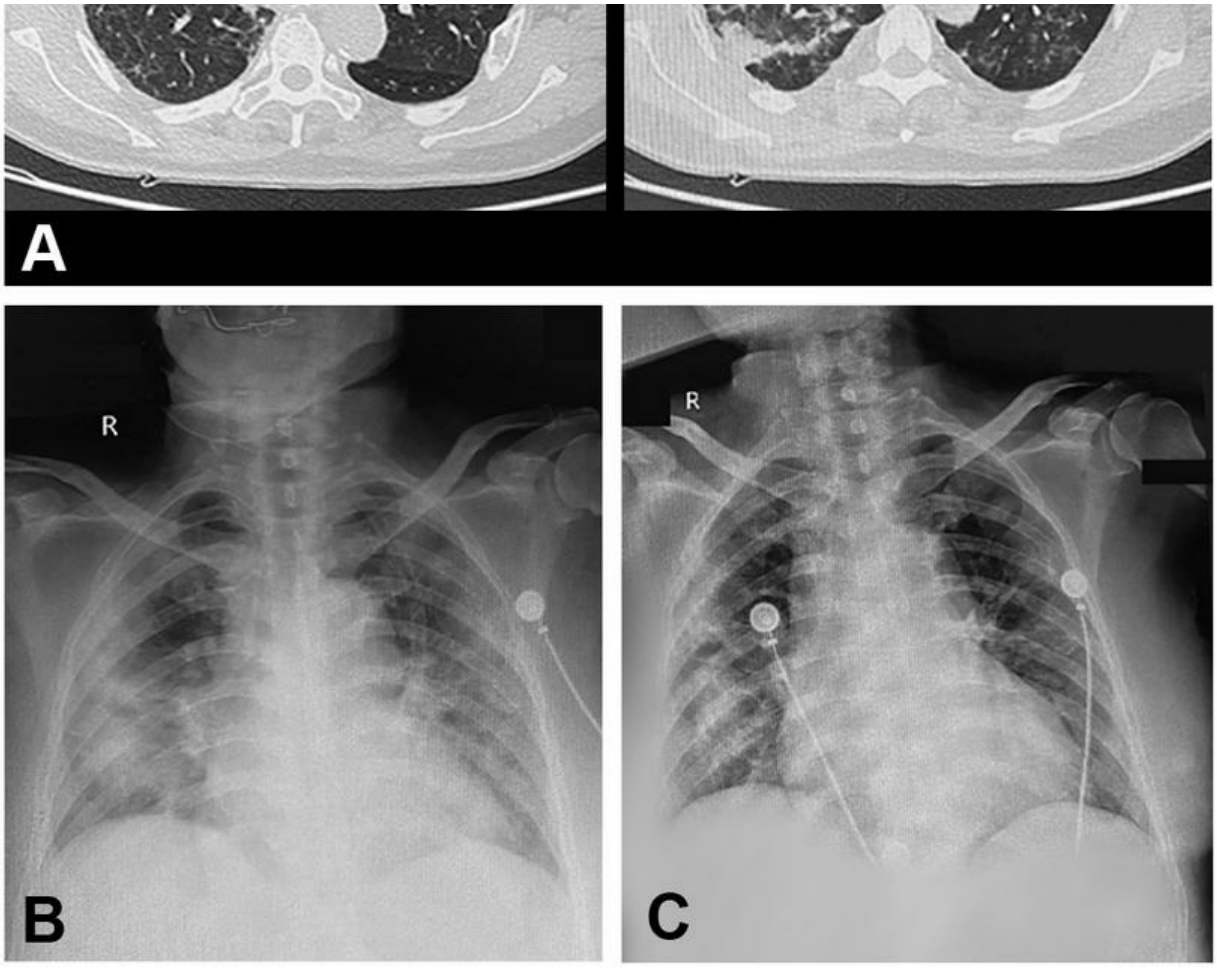


Figure 1

Radiographic images of the patient (A) Chest CT scan on day 1 showing bilateral multiple lobular subsegmental opacities and patchy consolidation. (B) Chest radiography on day 3 showing bilateral diffuse infiltrates. (C) Chest radiography on day 17 showing absorption of infiltrates after treatment.