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Letter to Editor

Lessons from a patient with severe aplastic anemia complicated with COVID-19

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To the editor,

COVID-19 patients with preexisting diseases are at high risk of worse clinical outcomes.¹ There is little data about intensive care COVID-19 patients with different comorbidities and how to deal with them.

A 53-year-old female patient was admitted to the hospital because of the medical history of SAA for half a year and the ongoing novel coronavirus epidemic. Her body temperature has been abnormal with the highest point reaching 40 °C, accompanied with chills, fatigue, cough and difficulty in expectoration. She had drugtaking history of cyclosporine (stopped for one month), allergy history of penicillin and cephalosporin and medical history of experiencing peripherally inserted central catheter line (removed already).

Routine blood tests revealed WBCs $0.28 \times 10^9/L$, neutrophils $0.06 \times 10^9/L$, lymphocyte $0.21 \times 10^9/L$, Hb 56 g/L. Blood culture was methicillin-sensitive staphylococcus aureus. Throat swab virus nucleic acid tests showed negative results for several times. Chest CT revealed multiple patchy opacities accompanied with multi-sub-pleural nodular shadows.

The patient was subsequently diagnosed with COVID-19, accompanied with sepsis and severe aplastic anemia. Arbidol and Lianhuaqingwen(LH) capsule² was considered for etiological antiviral treatment. Initial antibiotic therapy considered imipenem + vancomycin + voriconazole, combined with immunoglobulin and granulocyte stimulating factor treatment. She felt better after treatment with no abnormalities in vital signs; under the condition of oxygen absorption at a concentration of 0.41, SPO2 could reach 99% and inflammatory markers (i.e., CRP, PCT) decreased. Retest of cytokines at day 11 since admission showed a good trend. Imipenem was substituted with cefoperazone/sulbactam the next day. However, at day 14, the patient developed fever again ranging from 38.5 to 40 °C without hemodynamic changes. Re-examination of chest CT revealed an increased exudation, Fig. 1, hence antibiotic therapy was treated immediately; blood culture was again conducted. The patient experienced decreased

blood pressure, poor consciousness at day 18 after admission. Anti-shock treatment was ineffective, and PO2 dropped to 56 mmHg (15 L/min mask oxygen inhalation), and mechanical ventilation was conducted. Blood culture revealed infection of *Acinetobacter baumannii*, hence treatment strategy was adjusted to tigecycline combined with meropenem, vancomycin, and voriconazole. However, the patient died within 24 h after shock occurred.

SAA is an immune-mediated disease with a hematopoietic stem and progenitor cell destruction by an aberrant immune response involving the T cells.^{3,4} The ratio of neutrophil-to-lymphocyte (NLR) should be used with caution when encountering patients with preexisting medical conditions even though there was evidence of association between the ratio and the severity of COVID-19.¹ The patient was ultimately confirmed with SARS-CoV2 infection by positive IgM/IgG test after times of false negative of RT-PCR and atypical radiologic manifestation of chest CT, suggesting that cases with occult COVID-19 require particular vigilance and awareness during this pandemic.

To our knowledge, patient with COVID-19 complicated with SSA is quite rare, and this case report reminds us that atypical or even asymptomatic manifestations of COVID-19 may be disguised by inherent diseases. We call upon all the medical personnel to pay specific attention to original comorbidities, and patients with SSA needs early prevention of septic shock to improve overall outcome.

Ethics approval and consent to participate

The Ethics Commission of Tongji hospital approved this study, with a waiver of informed consent.

Consent for publication

Written informed consent for publication was obtained from all participants.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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List of abbreviations**COVID-19:**

Coronavirus Disease 2019;

SARS-CoV-2:

severe acute respiratory syndrome coronavirus 2;

COPD: chronic obstructive pulmonary disease;

CT: computed tomography;

SAA: severe aplastic anemia;

SPO₂: peripheral oxygen saturation;

Hb: haemoglobin;

PLT: blood platelet;

PT: prothrombin time;

APTT: activated partial thromboplastin time;

Fbg: fibrinogen;

PCT: procalcitonin;

ALT: alanine transaminase;

AST: aspartate Transaminase;

ALB: albumin;

TBIL: total bilirubin;

Glu: fasting blood glucose;

LDH: lactate dehydrogenase;

ESR: the erythrocyte sedimentation rate;

hs-cTnT: high-sensitive cardiac troponin T;

CK-MB: creatine kinase-MB;

IL-1 β : interleukin-1 β ;

IL-2R: the interleukin-2 receptor;

IL-6: interleukin 6;

IL-8: interleukin 8;

IL-10: interleukin 10;

TNF- α : tumor necrosis factor- α ;

LH: Lianhuaqingwen;

PEEP: positive end-expiratory pressure;

RBC: red blood cells;

NLR: ratio of neutrophil-to-lymphocyte;

RT-PCR: reverse transcription polymerase chain reaction;

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Authors' contributions

Drs J. Wang had full access to all of the data in the study. Drs Y. Wang, X. Lu, T and Chen contributed equally and share first authorship.

Conceptualization: Y. Wang, X. Lu, T. Chen.

Acquisition, analysis, or interpretation of data: J. Wang, Y. Wang, X. Lu, T. Chen.

Statistical analysis: X. Lu, F. Yan.

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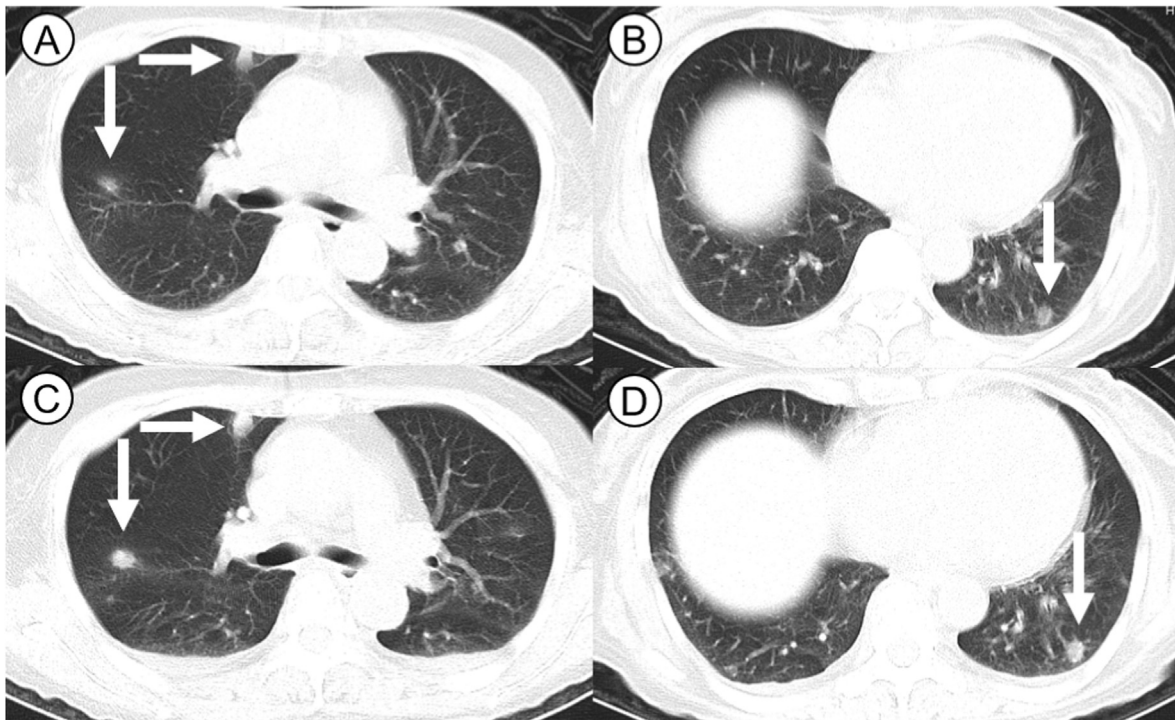


Fig. 1. Comparison of radiologic manifestations of the patient with severe aplastic anemia complicated with COVID-19. Chest CT scan scheduled on February 23, 2020, showing two nodule-like shadows on the right lung with blurred borders (A), and another shadow on the lower left lung (B). Retest scan scheduled on March 1, 2020, revealing larger nodules on the right lung with significantly increased density (C), and the shadow on the lower left lung was also markedly increased (D).

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Declaration of competing interest

The authors declare that they have no competing interests.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.asjsur.2020.07.007>.

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