Three-Center Experience on Patients with Influenza-Associated Acute Respiratory Distress Syndrome in Chongqing, China

Xue-Fei Yang[1], Tomer Talmy[2], Peng-Fei Li[1], Yao-Rong Zhang[3], Wei-Jun Song[4], Yao-Li Wang[1], Jian Zhou[1]

[1]Intensive Care Unit, Trauma Center, The Daping Hospital and Research Institute of Surgery of Army Medical University, Chongqing 400042, China
[2]Hadassah Medical Center, The Institute of Research in Military Medicine, The Hebrew University of Jerusalem, Jerusalem 91120, Israel
[3]Intensive Care Unit, Changan Hospital, Chongqing 400021, China
[4]Intensive Care Unit, Wushan County People's Hospital of Chongqing, Chongqing 404700, China

Xue-Fei Yang and Tomer Talmy contributed equally to this work.

To the Editor: Influenza-associated acute respiratory distress syndrome (ARDS) remains a devastating clinical picture.[1] From December 2017 to January 2018, ten patients with influenza-associated ARDS were admitted to three different hospital's Intensive Care Units (ICUs) in Chongqing, with all cases resulting in demise. The main documented reasons for their admission to the ICU were due to progressive dyspnea and worsening hypoxemia which lead to endotracheal intubation and mechanical ventilation in these patients. Identification of influenza viruses was achieved using nucleic-acid testing from venous blood. This study was approved by the Institutional Review Board of Daping Hospital, Army Medical University.

Clinical characteristics of the ten patients presenting with influenza-associated ARDS are shown in Table 1. Seven of these patients were infected with influenza A (H1N1) virus, two with influenza B virus, and one was infected with both strains. The most common clinical manifestations were cough, fever >38°C, shortness of breath, and chest computed tomography (CT) and/or X-ray-confirmed pneumonia and/or ARDS. Radiologically, all patients presented with a mixture of patchy consolidations and ground glass opacities.[2] Seven patients required assessment using an additional lung CT scan during their ICU stay. Clinically, suspected ARDS can be easily confirmed by lung ultrasonography through the recognition of a typical pattern characterized by Kerley B lines, subpleural consolidations, as well as spared areas. Patient histories revealed the following comorbidities: two patients with a history of rheumatoid arthritis, three with a history of asymptomatic bacteriuria, and one with a history of tuberculosis.

From the study of the blood tests, lymphocytes decrease significantly with severe flu. The single patient infected by both influenza A and B had comorbidities of rheumatoid arthritis and pulmonary interstitial fibrosis. He was treated with prone ventilation in the ICU. Lymphocyte count was 0.59×10^9/L. $CD8^+$ T cell count was 0.09×10^9/L. A different patient, a 73-year-old woman was treated with extracorporeal membrane oxygenation (ECMO) for influenza A-related ARDS. The lymphocyte count was 0.19×10^9/L. This patient suffered a seizure and collapsed shortly after. She also had a fever and respiratory symptoms before admission. Despite treatment with a mechanical ventilation, ECMO, inotropic agents, and oseltamivir, she died of ARDS and multiorgan failure after a 5-day stay in the ICU. Another patient, a young female identified with influenza B, presented with unique symptoms that included red-eyes, hemoptysis, abdominal pain, progressive dyspnea, and diffuse myalgia, followed by chills, nasal congestion, rhinorrhea, rigors, and fever (38.7°C). Her lymphocyte count was 0.31×10^9/L. It should be noted that these patients with a profound depressed cellular immune system and an influenza-like illness (including pain, fever, and pneumonitis) are consistent with the diagnosis of disseminated influenza infection.[3]

In conclusion, a severe influenza virus can lead to $CD8^+$ T cellular failure and thus affecting rehabilitation. The elderly patient had a chronic disease increase, a process often accompanied by an influenza viral infection, and the clinical features of influenza viral infection can be concealed by the increase of chronic diseases. It is vital to establish an influenza surveillance system in patients with a profound depressed cellular immune system as a requirement of the ICU in hospitals. We recommend an imaging-oriented approach combining lung ultrasound and thoracic CT as a suitable technique for management of

Address for correspondence: Prof. Yao-Li Wang, Intensive Care Unit, Trauma Center, Daping Hospital and Research Institute of Surgery of Army Medical University, Chongqing 400042, China
E-Mail: wangylchen2005@aliyun.com

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Table 1: Clinical characteristics of ten patients with influenza-associated ARDS

Cases	Age (years)	Gender	Date of diagnosis by virus examination	Underlying disease
1. Flu-A and B	54	Male	January 19, 2018	Rheumatoid arthritis, pulmonary interstitial fibrosis
2. Flu-A (H1N1)	73	Male	January 12, 2018	Rheumatoid arthritis
3. Flu-A (H1N1)	62	Female	January 9, 2018	Asymptomatic bacteriuria
4. Flu-A (H1N1)	36	Male	December 29, 2017	No
5. Flu-A (H1N1)	40	Male	January 12, 2018	No
6. Flu-B	18	Female	January 20, 2018	Facial pimples
7. Flu-A (H1N1)	59	Male	January 12, 2018	Tuberculosis, nasal vestibular papilloma
8. Flu-B	65	Male	January 12, 2018	Asymptomatic bacteriuria
9. Flu-A (H1N1)	42	Female	January 21, 2018	No
10. Flu-A (H1N1)	49	Male	January 27, 2018	Percutaneous transhepatic gallbladder puncture

Cases	Pulmonary ultrasound B line	Patchy consolidations	GGO	Honeycombing	Traction bronchiectasis	Pneumothorax or mediastinal emphysema	ICU stay (days)
1. Flu-A and B	++	+	+	+	+	+	12
2. Flu-A (H1N1)	++	+	+	+	+	+	5
3. Flu-A (H1N1)	+	+	+	–	–	–	1
4. Flu-A (H1N1)	++	+	+	–	–	–	5
5. Flu-A (H1N1)	+	+	+	–	–	–	2
6. Flu-B	++	+	+	–	–	–	2
7. Flu-A (H1N1)	+	+	+	–	+	–	2
8. Flu-B	+	+	+	–	–	–	1
9. Flu-A (H1N1)	++	+	+	–	–	–	2
10. Flu-A (H1N1)	+	+	+	–	–	–	2

ICU: Intensive Care Unit; ARDS: Acute respiratory distress syndrome; GGO: Ground glass opacity; ++: Strong pulmonary edema; +: Positive; –: Negative or normal.

influenza-associated ARDS during diagnosis, mechanical ventilation, and weaning. Finally, prone ventilation and ECMO technologies can prolong an ICU stay.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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