

Case Report

Immunocompetent adult infected with Epstein-Barr virus presenting as severe respiratory insufficiency: a case report

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Abstract: Epstein-Barr virus (EBV) is an ubiquitous human herpes virus with worldwide distribution. Severe EBV infections are mostly reported in immunocompromised patients, but not in immunocompetent individuals. Here, we reported an immunocompetent female adult suffering from an acute EBV pulmonary infection, leading to bilateral pneumonitis with respiratory failure. This case indicated combined therapy (steroids, immunoglobulin and antiviral agents) is recommended in EBV-induced severe respiratory insufficiency.

Keywords: Epstein-Barr virus, immunocompetent, respiratory insufficiency

Introduction

Epstein-Barr virus (EBV), one of the most successful viruses, infects over 90 percent of humans [1]. Primary infection with EBV occurs early in life and typically presents as infectious mononucleosis, and latent infection in a healthy adult can remain over years. However, severe EBV infections are often reported in immunocompromised patients, but not in immunocompetent individuals [2]. We herein reported a case of immunocompetent adult patient who had bilateral pneumonitis with severe respiratory insufficiency in the course of an acute EBV infection.

Case report

A 42-year-old woman, previously healthy with no relevant family history, was admitted to the respiratory department of West China Hospital suffering from fever and dyspnoea for 10 days with sore throat, but no headache, productive cough and chest pain. Before admission, macrolide, meropenem and norvancomycin were

given in the local hospital without improvement, whereas fever and dyspnea developed progressively. On admission, her temperature was 38.9°C, pulse rate was 120/min, respiratory rate was 25 times per minute and blood pressure was 126/78 mmHg. No obvious positive signs except pharyngeal hyperaemia were detected in physical exams. Her laboratory data were mainly shown in **Table 1**. Chest X-ray and computed tomography (**Figure 1A, 1B**) showed bilateral diffuse infiltrates with pleural effusion. The echocardiography revealed small pericardial effusion.

The diagnoses of EBV-induced bilateral pneumonia with type I respiratory failure, acute cardiac insufficiency and dysfunction of liver were initially established. Due to her persistent and progressive respiratory insufficiency, non-invasive positive pressure ventilation was performed. Anti-EBV treatment was utilized with ganciclovir (250 mg, thrice a day). In addition, diuretic and glutathione were administered to improve cardiac and liver functions. Her body temperature returned to normal on day 3 after admission, but the arterial oxygenation was not improved markedly (51.9 mmHg), and methyl-

Table 1. Results of laboratory tests during 25 days of disease course

	Day 1	Day 12	Day 25
Hb (g/L)	83	90	112
PLT ($\times 10^9/L$)	95	203	300
WBC ($\times 10^9/L$)	7.20	5.17	4.09
Mono%	10.6	5.6	4.9
ALB (g/L)	24.3	37.6	41.6
ALT (IU/L)	69	40	27
AST (IU/L)	99	61	28
BNP (pg/mL)	3868	65	-
CRP (mg/L)	45.40	3.20	-
G-test	Negative	-	-
EBV-DNA (copies/mL)	2.63×10^3	8.86×10^1	Negative
HIV-DNA (copies/mL)	Negative	-	-
HBV-DNA (copies/mL)	Negative	-	-
EBV-EA-IgG	Positive	-	Positive
PaO ₂ (mmHg)	49.6	74.7	99.5

Abbreviations: ALB, Albumin; ALT, Alanine aminotransferase; AST, Aspartate aminotransferase; BNP, brain natriuretic peptide; CRP, C-reactive protein; Hb, Hemoglobin; HBV, hepatitis B virus; HIV, human immunodeficiency virus; PLT, Platelet; WBC, White cell count.

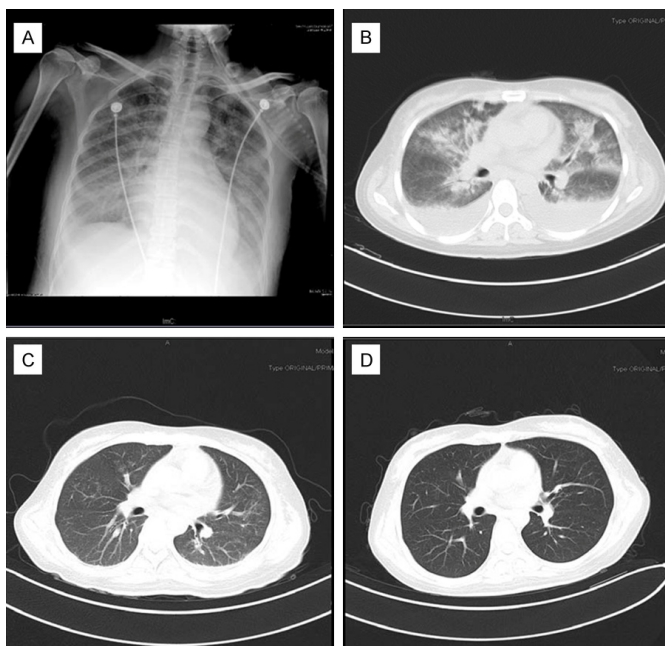


Figure 1. A. Chest X-ray son admission showed diffuse alveolitis and infiltrates in both lungs. B. Chest CT scan on admission showed bilateral pulmonary patchy opacities, pulmonary edema, a ground glass pattern and pleural effusion. C. Chest CT scan on the 12th hospital day showed significant resolution of pulmonary infiltrates, pulmonary edema and pleural effusion. D. Chest CT scan on discharge showed bilateral pulmonary opacities and pleural effusion disappeared.

prednisolone (40 mg, once a day) and immunoglobulin (400 mg/kg, once a day) were added at this time. Nine days later, the PaO₂ in arterial blood was gradually increased to 74.7 mmHg. The ventilator, immunoglobulin and methylprednisolone were removed. Meanwhile, the copies of EBV-DNA, as well as serum BNP and liver enzyme were decreased significantly. The chest CT showed significant resolution of the pulmonary infiltrates (**Figure 1C**). On discharge (day 25), the titer of EBV-DNA was negative, and a chest CT scan (**Figure 1D**) was obtained. The telephone follow-up indicated a full recovery of this woman one month after discharge.

Discussion

This case presented as an infectious mononucleosis with positive EBV serology in a healthy adult without predisposition of severe pulmonary EBV infection. Clinically, severe hypoxemia appears to be a predominant feature of EBV-induced pneumonitis; however, it remains unclear whether respiratory insufficiency in pulmonary EBV infection is a result of direct viral invasion and/or an immunological reaction [3]. In this case, initial mechanical ventilation plus antiviral treatment did not increase blood oxygen saturation sufficiently, but blood oxygenation improved markedly following the treatment of corticosteroid and immunoglobulin, indicative of an underlying immunological mechanism in EBV-induced pulmonary infections [4]. Moreover, antiviral treatment with ganciclovir is not recommended in uncomplicated mononucleosis, but it appears reasonable to use ganciclovir in combination with corticosteroid in patients with severe EBV infection [5].

In summary, this case suggests an efficient combined treatment (steroids, immunoglobulin and antiviral agents) on EBV-induced severe respiratory insufficiency, possibly owing to regula-

tion of EBV-associated immunological reactions in lungs.

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Disclosure of conflict of interest

None.

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