MEGA JOURNAL OF CASE REPORTS

Case Presentation

Compiled Date: May 19, 2023

A Case of Severe Pneumonia Caused by Influenza A (H1N1) Virus Infection

Hu Kai*, Yin Caixia, Xie Yu and Liang Tiansi

Department of Critical Care Medicine, Yangtze River Shipping General Hospital, China

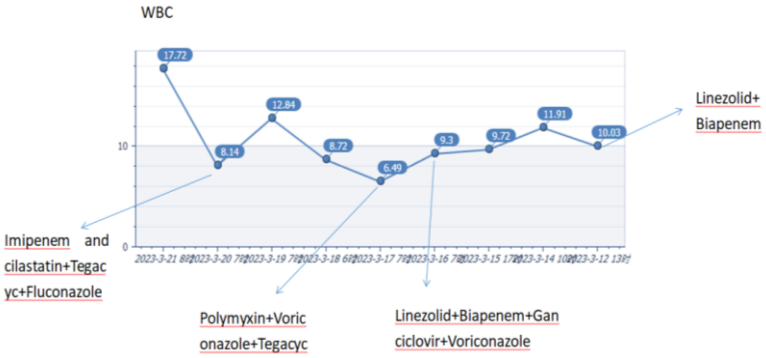
***Corresponding author**: Hu Kai, Department of Critical Care Medicine, Yangtze River Shipping General Hospital, Wuhan 430015, Hubei, China, E-mail: 188742807@QQ.com

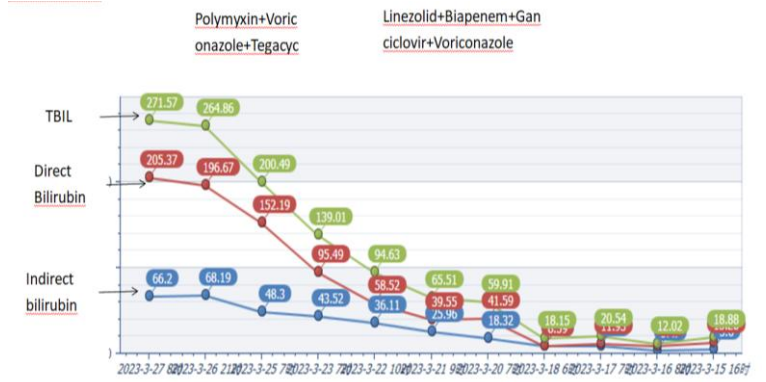
Abstract

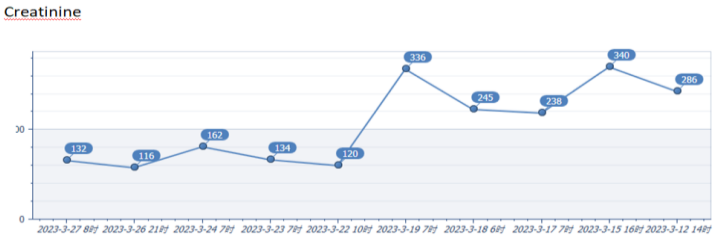
The patient had cough, phlegm, wheezing for 5 days, aggravation and fever for 3 days. He had a history of hypertension for more than 10 years, and the highest blood pressure was 203/160mmhg. He was under long-term medication control, and had a history of type 2 diabetes for more than 10 years. No specific NGS in the family history suggest A/H1N1 infection. On admission, methylprednisolone + Linezolid + Biapenem were given. Tracheoscopy. The disease progresses rapidly. On the same day, she was transferred to ICU for non-invasive ventilator assisted breathing, and continued hypoxemia. She was given tracheal intubation ventilator assisted breathing and prone ventilation. When the symptoms did not improve, W-ECMO treatment was given. The problems that occurred during the period were as follows:

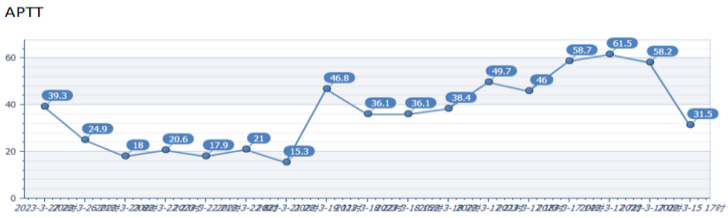
- Thrombocytopenia, considering heparin-induced decreased blood pressure and bleeding tendency, was given anticoagulant therapy with naphthalmoxat.
- Severe infection resulted in liver and kidney failure, and CRRT+ plasmapheresis was administered several times.
- Combined with Acinetobacter Baumannii, Serratia marcescens, Candida albicans infection, constantly adjust the anti-infection treatment.

Finally, with the joint efforts of everyone, she was discharged from hospital.


WBC
Linezolid+
Biapenem
Imipenem and
cilastatin+Tegac
yc+Fluconazole
Polymyxin+Voric
onazole+Tegacyc
Linezolid+Biapenem+Gan
ciclovir+Voriconazole


Polymyxin+Voric
onazole+Tegacyc
Linezolid+Biapenem+Gan
ciclovir+Voriconazole
TBIL
Direct
Bilirubin
Indirect
bilirubin


Creatinine


APTT

Case Introduction

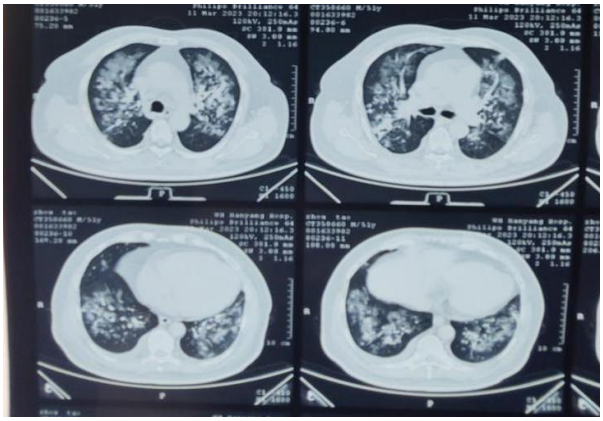
General information

Patient, male, 51 years old; Due to coughing, expectoration, and wheezing for 5 days, exacerbation accompanied by fever for 3 days. Moved in to the Respiratory Department on March 12, 2023. Physical examination: Body temperature 37.5 ℃, pulse 110 times/minute, breathing 30 times/minute, blood pressure 155/60 mmHg, clear consciousness, no yellow staining of the skin and sclera, soft neck, thick respiratory sounds in both lungs, can be heard with thick and wet rales all over the lungs, enlarged heart boundary, heart rate 110 times/minute, regular rhythm, no obvious pathological murmurs in each valve area, soft abdomen, no tenderness or rebound pain, normal bowel sounds, no edema in both lower limbs, scattered rash in both lower limbs. Auxiliary examination: March 11, 2023, Wuhan Hanyang Hospital Chest CT: 1, Multiple lung infections; Bilateral pleural effusion. On March 11, 2023, blood routine: white blood cells 10.03X109/L, neutrophils 90.8%, lymphocyte count 0.21 X109/L, lymphocyte percentage 4.6%, CRP 177.94 mg/L, PCT 2.38 ng/mL. Blood gas analysis showed P02 47 mmHg PC02 33 mmHg.

Past: more than 10 years of hypertension history, 203/160 mmhg of maximum hypertension, long-term medication control, more than 10 years of type 2 diabetes history, long-term insulin control of blood sugar, no history of allergy, no history of blood transfusion. There is no special family history.

Admission diagnosis: severe community-acquired pneumonia, type I respiratory failure.

After admission, targeted treatments such as linezolid+biapenem anti infection treatment, methylprednisolone pulse therapy, asthma relief, kidney protection, uric acid lowering, liver protection, diuresis, bronchoscopy alveolar lavage, non-invasive ventilator assisted ventilation, etc. will be given.



The patient suffered from dyspnea, rapid disease progression, and decreased finger pulse oxygen. At 12:19, he was transferred to ICU for continuous non-invasive ventilator assisted ventilation. At 16:50, oxygen saturation dropped to 80%, sweating profusely, breathing 35 times/minute, heart rate 110 times/minute, and blood pressure 112/70 mmHg. Diagnosis: ARDS, type I respiratory failure, tracheal intubation, and ventilator assisted ventilation were given. AT 17:00 90% of patients with oxygen saturation were treated with ventilation in prone position. Provide targeted treatment such as anti infection (biapenem+linezolid), stomach protection, asthma relief, anti-inflammatory, and nebulization.

Arterial blood gas analysis showed that PH 7.38 P02 51mmHg PC02 31 mmHg. Considering the imaging examination, viral pneumonia and fungal pneumonia may be treated with 0.2g bid of voriconazole and 0.25g qd of ganciclovir for anti infection. Continuous prone position ventilation treatment. 17: 30 patients underwent continuous ventilator assisted ventilation (oxygen concentration of 100%) with pulse oxygen of 80%. Blood gas analysis showed that PO2 was 51mmHg. After communicating with family members, VV-ECMO treatment was performed. At 19: 00VV-ECMO was successfully put into operation at 3000 rpm, with a flow of 4.6L/min and heparin of 0.5ml/h. Continuous sedation and analgesia with propofol, midazolam and sufentanil were given, and muscle relaxation was maintained by intravenous pumping of atracurium. Prone position ventilation for 12 hours per day. The patient had a creatinine value of 398 umol/l, uric acid of 648 umol/l, and low urine output, and was treated with a combination of VV-ECMO and CRRT. Infusion of 2u red blood cells and 600 ml plasma.

金域医学 KingMed Diagnostics

呼吸道病原体靶向检测198项报告单

样本信息			
受检者信息	姓名：周涛	性别：男	年龄：51岁
	住院号/门诊号：2023004058		床号：抢1
样本信息	样本条码：1804166871	实验编号：RT514	样本类型：肺泡灌洗液
	采样日期：2023-03-15	接收日期：2023-03-16	医院条码/识别码：
送检方信息	送检医院：长江航运总医院-检验科		
	送检科室：呼吸与危重症科、血液		送检医生：黄江民
临床信息	急性呼吸窘迫综合征		

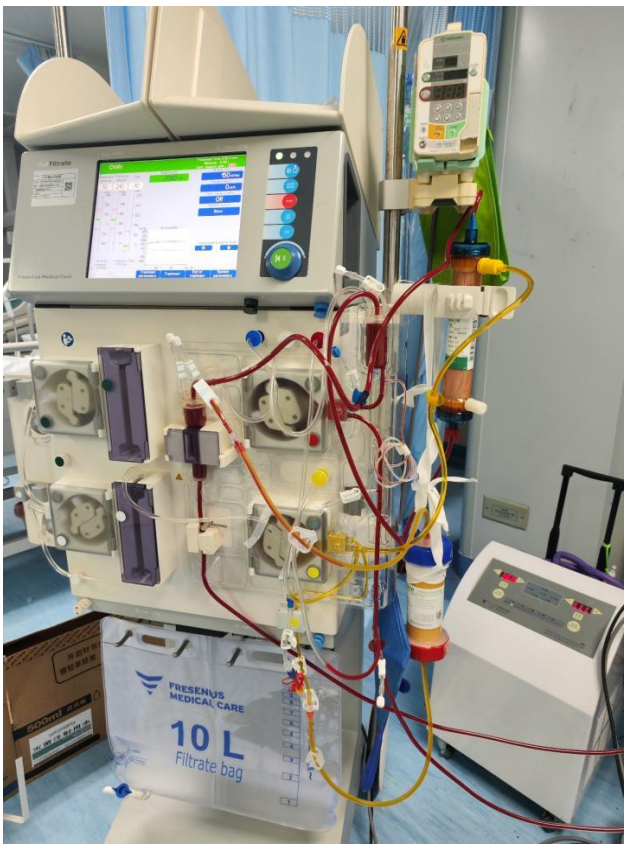
病原微生物检测结果

类型	属名	微生物名称	均一化序列数	病原估测浓度(copies/mL)	微生物分类(按样本类型)
1.特殊病原体列表（分枝杆菌、支原体、衣原体、立克次体等）					
未发现					
2.细菌列表					
革兰阴性菌	不动杆菌属 *Acinetobacter*	鲍曼不动杆菌 *Acinetobacter baumannii*	44551	>1.0E+6	B
革兰阴性菌	沙雷菌属 *Serratia*	黏质沙雷菌 *Serratia marcescens*	5079	4.8E+5	B
革兰阴性菌	克雷伯菌属 *Klebsiella*	肺炎克雷伯菌 *Klebsiella pneumoniae*	3924	1.2E+5	A
革兰阴性菌	假单胞菌属 *Pseudomonas*	铜绿假单胞菌 *Pseudomonas aeruginosa*	941	9.0E+4	A
3.真菌列表					
真菌	念珠菌属 *Candida*	近平滑念珠菌 *Candida parapsilosis*	125	<1.0E+3	B
4.病毒列表					
RNA病毒	甲型流感病毒属 *Alphainfluenzavirus*	甲型流感病毒H1N1(2009) *Influenza A virus(H1N1pdm09)*	23816	>1.0E+6	A

均一化序列数：每100K的原始序列中含有该微生物的序列数，均一化序列数越高，则样本含有该微生物的可靠性越高。
病原估测浓度(copies/mL)：通过生物信息学方法计算样本中微生物含量，该结果并非绝对定量，仅供临床参考。

On March 15th, according to the targeted monitoring results of respiratory pathogens: Acinetobacter, Salmonella, and influenza A virus. Stop using ganciclovir+linezolid and add oseltamivir capsules. 19: 00 Stop CRRT for 24 hours, ultrafiltration 6170 ml. On March 19th patient showed coffee colored gastric juice during gastrointestinal decompression, with slight bleeding around the ECMO tube. Upon re examination, Hb 78 g/l was found, and active bleeding and abnormal coagulation function were considered. Heparin was discontinued. And infuse 2u of hemoglobin and 400 ml of plasma. On March 20th, the bedside chest X-ray showed pulmonary edema and the patient had low urine output. CRRT

treatment was performed again; The patient has thrombocytopenia, and considering the possibility of heparin induced thrombocytopenia or antibiotic induced thrombocytopenia, the patient should switch to anticoagulant therapy with naphtholimus. Culture of alveolar lavage fluid indicates Candida albicans. Adjust antibiotics: discontinue biapenem+voriconazole. It is changed to: imipenem cilastatin+fluconazole+tigecycline. On March 21st, the patient suffered from nasal bleeding, bleeding at the ECMO puncture point, and abnormal coagulation function. They were discontinued with naprolimus and treated with non anticoagulant therapy. Apply for infusion of red blood cells, platelets, and plasma for treatment. On March 22nd at 9:00 am, CRRT was discontinued for 37 hours, with ultrafiltration of 4600 ml. Phlegm culture: Acinetobacter baumannii, Klebsiella pneumoniae. The infection indicators have not improved, and the anti infection effect is poor. Adjust the antibiotic treatment plan. The anti infection treatment was performed with colistin sulfate+tigecycline+fluconazole. The patient has nasal bleeding and bleeding at the ECMO puncture point, and continues to receive infusion of red blood cells, plasma, and cryoprecipitates. On March 25th, the patient had a total bilirubin of 200 umol/l, and considered drug-induced hepatitis and cholestatic hepatitis. Plasma exchange was performed; Starting at 22:31, VV-ECMO+CRRT+plasma exchange was performed for a total of 120 minutes, with a total of 2000 ml of plasma infusion.



On March 26th, the bleeding after plasma catheterization improved compared to before, and continued ECMO+CRRT treatment; VV-ECMO has a rotational speed of 2000 rpm, a flow rate of 2.6 L/min, lung compliance of 63 ml/cm H_2O, and a ventilator FIO2 60% blood gas analysis of PO2 77 mmhg. On March 27th, the patient's reexamination showed a slight improvement in their lungs compared to before, and ECMO was discontinued. After systematic treatment, they were successfully discharged on April 21st.

Discussion

The severe cases and mortality rate of influenza A (H1N1) are constantly increasing. A considerable proportion of patient's progress within a few days of onset, leading to acute lung injury, even acute respiratory distress syndrome, and multiple organ dysfunctions. Most of the patients admitted to the hospital were accompanied by pneumonia and respiratory failure **[1].** In this case, only three days after the onset of the disease, the chest CT showed extensive exudative lesions in multiple lobes of both lungs, and the disease progressed rapidly. The arterial partial pressure of oxygen in the admission artery was only 47 mmhg. If the patient was not transferred to the ICU in time or drugs, respirator support and ECMO support could not stop the progress of the disease, it would eventually lead to death. This case is accompanied by thrombocytopenia, which is considered to be related to the use of heparin anticoagulation, and it cannot be ruled out that medication may cause it. There are reports that the immune response generated by the virus itself can disrupt the hematopoietic system, hindering the maturation of neutrophils and platelets or increasing their damage.

This patient has viral infection combined with bacterial and fungal infections **[2].** Combined with tigecycline and polymyxin, fluconazole injection, and oseltamivir capsules. Strengthening the use of antibiotics in the early stages can effectively control the rapid progression of the disease caused by secondary bacterial infections after H1N1 infection.

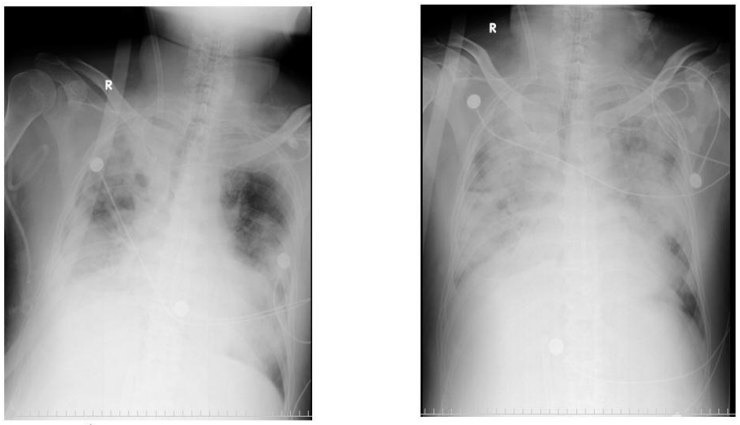
Prone Position Ventilation (PPV) can promote alveolar recruitment in the patient's back, regulate anterior chest wall perfusion, improve ventilation blood flow ratio, and thereby increase oxygenation index and improve treatment effectiveness by changing the patient's position. Originally, the patient was ventilated in the prone position for 12 hours per day, but we found that the oxygenation index and lung compliance were better in the prone position than in the supine position. Patients with acute onset, rapid progression, and severe illness due to the combination of influenza A virus and pneumonia. Mastering the characteristics of the disease course is crucial for clinical doctors to diagnose and treat severe cases of influenza A (H1N1). Clinicians should pay attention to the investigation of lung lesions in fever clinics, and control the lung lesions as soon as possible. It is very important to strive for treatment timing and improve prognosis.

References

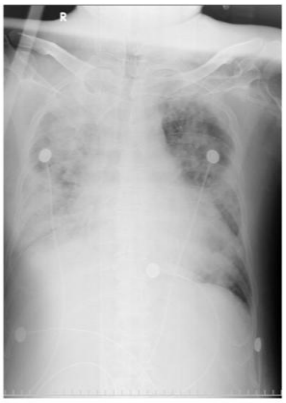
1. Su F, Hammer CB. Dexmedetomidine: pediatric phamacology clinical uses and safety. Expert Opin Dug Saf. 2011;10(1):55-56.
2. Gorordo-Delsol LA, Mandolado-Beltran I, Rodriguez-Peredo A, et al. Prolonged and Uninterrupted Prone Position in Acute Respiratory Distress Syndrome. Crit Care Med. 2021;49(8):e809-e810.

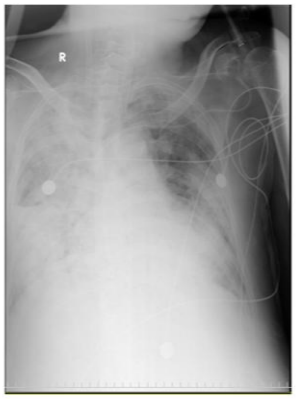
Annex

Imaging



March 18th March 20th

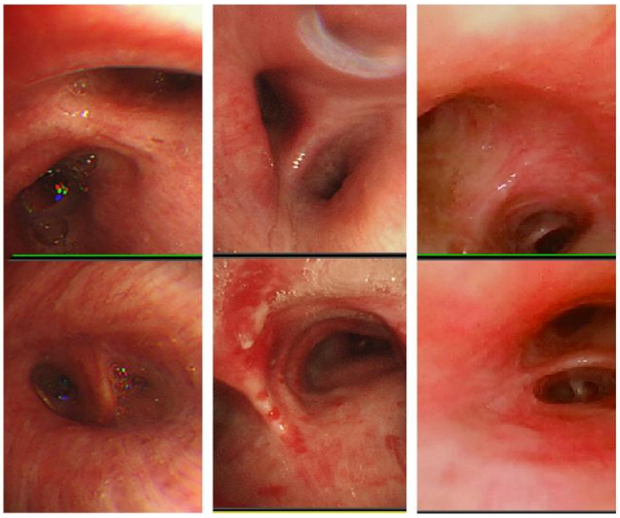




March 22th March 24th

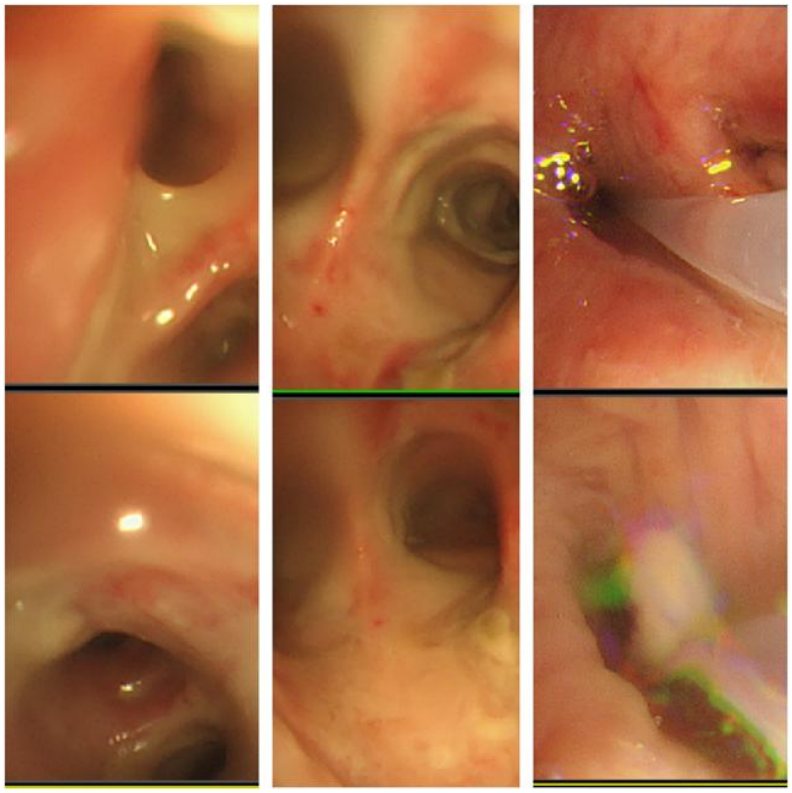
Tracheoscopy treatment

March 15th March 17th March 20th



Tracheoscopy treatment

March 21th March 23th March 25th



White blood cells

Citation of this Article

Kai H, Caixia Y, Yu X and Tiansi L. A Case of Severe Pneumonia Caused by Influenza A (H1N1) Virus Infection. Mega J Case Rep. 2023; 6: 2001-2011.