Multiorgan failure secondary to influenza A associated hemophagocytic syndrome

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Introduction: Virus associated hemophagocytic syndrome (VAHS) is severe complication of numerous viral infections that is associated with "cytokine storm" and the accumulation of activated T-lymphocytes and macrophages in various organs, frequently resulting in multiorgan failure and death[1,2]. We present a case report of VAHS caused by Influenza A infection.

Case report: 50-years old, previously healthy male presented to Emergency Department with fever and respiratory failure. Initial arterial blood gases showed global respiratory failure with acidosis (pH < 6.8, pCO_2 9.3 kPa, pO_2 8.7 kPa, lactates 13.5 mmol/L, HCO3- unmeasurable). Computed tomography showed left sided pneumonia, and initial laboratory workup showed severe leukopenia, elevated C-reactive protein, and mild renal lesion (**Table 1**). Polymerase Chain Reaction (PCR) was positive for Influenza A, and Streptococcus Pyogenes was isolated from bronchoalveolar lavage. After initial workup patient arrested and cardiopulmonary reanimation (CPR) with intubation was performed. Post-CPR echocardiography showed severely reduced left ventricular systolic function (LVEF <15%) with suspected thrombus in left ventricle (**Figure 1**). Patient was hemodynamically unstable despite massive volume resuscitation, vasopressors, and inotropes so under ultrasound guidance veno-arterial extracorporeal membrane oxygenation (VA-ECMO) was placed. Hemodialysis with Oxyris filter was initiated. Because of severe pancytopenia bone marrow biopsy was performed which confirmed VAHS. Treatment

TABLE 1. Laboratory workup at admission.

Laboratory parameters	Value (reference interval)
Hemoglobin (g/L)	144 (138 – 175)
Leukocytes ($x10^9$)	**0.8** (3.4 - 9.7)
Neutrophiles ($x10^9$)	**0.49** (2.06 - 6.49)
Lymphocytes ($x10^9$)	**0.27** (1.19 - 3.35)
Platelets ($x10^9$)	120 (158 – 424)
Troponin I (ng/L)	8.5 (0 - 34.2)
Urea (mmol/L)	8.6 (2.8-8.3)
Creatinine (umol/L)	**138** (60 – 104)
C reactive protein (mg/L) < 5	**268.7** (<5)
Bilirubin (umol/L)	12 (3 – 20)
Alanine-aminotransferase (U/L)	24 (12 – 48)
D-Dimers (mg/L)	4.35 (0-0.50)

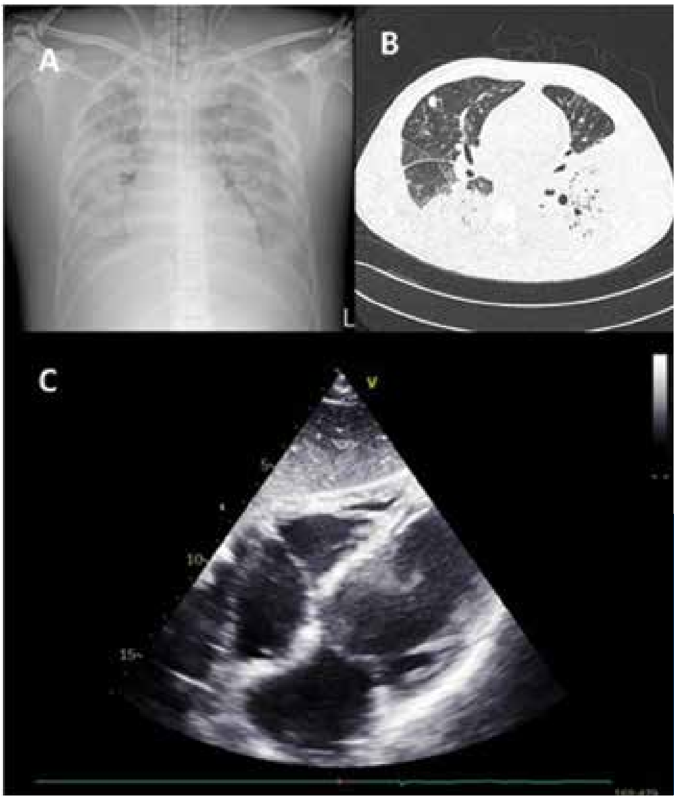

FIGURE 1. Imaging methods after admission: A) Chest X-ray after VA ECMO placement showing bilateral extensive confluent, homogeneous infiltrates of the lung parenchyma; B) Computed tomography showing extensive zones of consolidation in the lower lobes of the lungs and large zone of destruction of left lower lung lobe; C) Echocardiography (subcostal view) showing thrombus formation in the left ventricle.

included Pentaglobin and intravenous immunoglobulins supplementation, high doses of glucocorticoids and cyclosporin A. After 5 days ECMO configuration was changed to VAV ECMO because of suboptimal peripheral oxygenation. Bedside echocardiography was performed every day and gradual recovery of LVEF was verified and because of that, seven days after admission ECMO configuration was changed to VV ECMO. Total ECMO support time was 20 days. Because of prolonged mechanical ventilation percutaneous tracheotomy was performed. Treatment complications included multiple hospital acquired infections, cytomegalovirus reactivation, necrosis of all toes and two fingers, severe critical illness polyneuropathy, cachexia, acalculous cholecystitis. After 3 month of treatment patient is in process of weaning from mechanical ventilation.

Conclusion: VAHS is one of rare and potentially lethal complications of Influenza A which can lead to multiorgan failure that can require mechanical circulatory support. Echocardiography plays crucial role in diagnostics and management of critical ill patients.

LITERATURE

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