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Case Report

Unusual Presentation of Influenza B Virus in a Neonate

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ABSTRACT

The presentation of neonatal influenza B in neonates can vary from a mild self-limited disease to acute presentation carrying high morbidity and mortality. This report describes one case of influenza B in a neonate who presented with severe respiratory distress syndrome and acute renal failure.

1. INTRODUCTION

Influenza is a highly contagious viral infection belonging to the Orthomyxoviridae family of viruses that usually leads to self-limited illness, predominately in children between the ages of 2 and 5 years [1]. Presentation in neonates is generally variable, ranging from subclinical disease to complicated respiratory failure [2]. Although it is uncommon, it could also lead to multiple organ failure [3]. Thus, diagnosis presents a challenge for clinicians, especially in sick infants, as it requires specific investigations. Awareness of possible disease pathway is essential for effective treatment or possible prevention. In this paper, we report a 7-day-old neonate with influenza B virus-associated pneumonia who presented with severe respiratory distress syndrome and acute renal failure. To the best of our knowledge, there have been no studies reporting influenza B with renal failure in early neonatal life to date.

2. CASE PRESENTATION

A previously healthy 7-day-old full-term male with an unremarkable antenatal and perinatal history presented on the day of the illness's onset with mild coughing, refusal of feeding, and reduced respiratory effort. Examination of the infant revealed lethargy with shallow breathing, tachycardia (195/min), hypoxemia (SpO_2 50%), hypotension (30/20 mmHg) with prolonged capillary refill (>4 s), and severe mixed acidosis (pH = 6.9, pCO_2 = 72, HCO_3 = 10, base excess (BE) = −18). He had no fever. The severe and persistent apnea necessitated immediate intubation and, subsequently, assisted ventilation. Pulmonary hemorrhage was noted, and the initial chest x-ray showed diffuse bilateral opacification. The shock status required cautious hydration, correction of acidosis with sodium bicarbonate, and intravenous catecholamines (20 μg/kg/min dopamine, 20 μg/kg/min dobutamine, 0.4 μg/kg/min adrenaline, and hydrocortisone 3 mg/kg/day, divided doses). The creatinine phosphokinase was 809 IU/L. Echocardiography showed normal heart structure, dilated cardiomyopathy, severely depressed left ventricular function, (ejection fraction of 29%), evidence of thrombus in the right atrium (3 × 4 mm), and pulmonary hypertension. An abdominal organ ultrasound (liver, spleen, pancreas, colon, and appendix) revealed no pathology. Both kidneys showed increased cortical echogenicity. However, the blood flow is preserved bilaterally. The initial blood count, including bleeding profiles, was within the normal range. Metabolic screens (including tandem mass spectrometry, serum ammonia, and lactate) were urgently sent. The hyperammonemia treatment protocol was discontinued owing to the unusually rapid correction of ammonia and, later, the normal metabolic screen. Despite isolation and the maximum support, the infant's condition deteriorated, and escalation to high-frequency ventilation was required in addition to nitric oxide for the worsening pulmonary hypertension. No improvement was noted on the empirical antibiotic, and negative blood culture was observed. C-reactive protein increased to 144 mg/L, whereas platelets decreased to 37,000/μL with increased liver enzymes. On the 4th day after the onset of the illness, anuria was observed, associated with generalizing body edema that is refractory to normal saline challenge test and diuretics. Urea increased to 25 mmol/L and creatinine to 300 μmol/L. Ultimately, a nephrologist's opinion was obtained, and dialysis was advised. The patient tested negative for the respiratory syncytial virus, but the nasopharyngeal swab was positive for influenza B virus. A renal dose of oseltamivir was completed.

After 3 weeks of peritoneal dialysis, the infant demonstrated improved renal function and stabilization of kidney-induced high blood pressure. The right atrium clot was dissolved upon regular intravenous doses of low molecular weight heparin. Blood and inflammatory markers started to settle. His chest x-ray showed further improvement throughout treatment, and he became

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capable of being weaned from respiratory support. Repeated renal ultrasound demonstrated small left kidney with mild echogenic in echotexture. Echocardiography revealed normal cardiac anatomy and function. He was released in good condition after gradual weaning of antihypertensive medication and normalization of the kidney function tests.

3. DISCUSSION

Influenza is a seasonal disease worldwide with an increasing number of patients requiring hospitalization. Studies reporting neonatal flu are few [4]. We have reported a rare presentation of influenza B in a neonate, where oseltamivir resulted in mild clinical improvement; however, it did not prevent serious disease complications. Our patient presented with lethargy, severe respiratory distress, pulmonary hemorrhage, apnea, and circulatory failure. Because of the rarity of influenza in the neonatal period, sepsis, critical congenital heart disease, and metabolic disorders were excluded first. The viral test showed a positive influenza B. Despite the low possibility of transplacental transmission, direct exposure to sick family members or caregivers is the most likely scenario [5]. The clinical presentation in neonates is reasonably nonspecific and is not easily distinguished from other causes of sepsis [6]. In accordance with Meibalane et al. [7], apnea and shallow breathing were observed in this case. Severe respiratory distress syndrome, which is observed in hyaline membrane disease, could be one presentation of a full-term infant with neonatal influenza, as in our case. A similar presentation has been reported by Martic et al. [8] in full-term infants with influenza H1N1; however, to the best of our knowledge, no cases have been reported with influenza B. Serious brain injuries and convulsions have been reported, although these were not seen in our case [9]. Acute myocarditis is a well-known complication of influenza B virus. The clinical presentation varies from mild symptoms to severe hemodynamic dysfunction requiring inotropes. Diagnosis is generally made by echocardiogram with findings typically consisting of a globally reduced ejection fraction of the left ventricle [10]. Early cardiac support can prevent the fatal outcome of viral myocarditis. Neonatal thrombosis is rarely described at birth, and in most cases results from an indwelling arterial catheter or some inherited thrombophilic conditions. The pathogenesis of the thrombus in this situation is not fully understood; however, a severe cardiopulmonary compromise could be a precipitating factor. Acute renal failure is a very unusual complication of neonatal influenza. Our patient survived the auric renal failure through prolonged renal dialysis for 3 weeks. To the best of our knowledge, the rapid progression of severe respiratory distress and the prolonged need for dialysis because of acute renal failure have not been reported to date in a neonate with influenza B. The relationship between influenza B and acute renal failure in neonates is not fully understood; however, it could be a consequence of multisystem organ failure that accompanied the influenza inflammatory process.

4. CONCLUSION

This report emphasizes that influenza B can carry a high rate of morbidity and mortality in neonates. Severe respiratory distress syndrome and acute renal failure are potential presentations of the disease. Therefore, it is crucial to include influenza screening as part of unexplained respiratory distress or renal injury workup in neonates. Early diagnosis and symptomatic treatment could help to reduce mortality, decrease the severity of the disease, and prevent further complications.

CONFLICTS OF INTEREST

The authors declare they have no conflicts of interest.

AUTHORS' CONTRIBUTION

AA, EH, MA and SN contributed in conceptualization, review and editing the manuscript. SN contributed in data collection. MA contributed in writing the original draft. EH supervised the project. However, all the authors review the manuscript and approve the final draft.

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