

Severe Measles-Related Pneumonia in Children Treated with Steroid

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Abstract

Keywords

- measles
- pneumonia
- prednisolone
- children

Measles still remains one of the major causes of childhood morbidity and mortality in developing countries. It is a highly contagious viral illness with worldwide occurrence. In spite of a highly vaccinated population, a measles outbreak still occurred in Saudi Arabia in 2019, mainly in the northern regions. Measles-related pneumonia (MRP) is the commonest cause of death in children with measles. In this study, we described two cases of severe MRP in children, who were successfully treated with steroid during the 2019 outbreak.

Introduction

Measles still remains one of the major causes of childhood morbidity and mortality in developing countries.¹ It is a highly contagious viral illness that occurs worldwide. In spite of a highly vaccinated population, a measles outbreak still occurred in Saudi Arabia mainly in the northern regions in 2019. Measles-related pneumonia (MRP) is the most common cause of death in children with measles.²

In this study, we described two cases of severe MRP in children who were successfully treated with steroid during the 2019 outbreak.

Case Report 1

A 4-month-old, previously healthy, male infant was admitted to our hospital with fever, severe respiratory distress, and maculopapular rash which started 5 days prior to admission. He was also diagnosed with measles as he was coming from an epidemic area, and had received two doses of oral vitamin A 100,000 IU in another hospital. However, upon arrival he required intensive care admission with low flow oxygen because of severe tachypnea. There were no signs of obstructive lung disease on chest examination. Chest radiograph revealed bilateral hilar infiltrate (►Fig. 1). All cultures collected were negative, and the enzyme-linked immunosorbent assay (ELISA)

for measles-specific immunoglobulin M (IgM) antibody tested positive in addition to measles positive polymerase chain reaction (PCR) from respiratory secretions. Despite broad antimicrobial therapy for 5 days, his clinical condition deteriorated. Methyl prednisolone was introduced with 2 mg/kg/d for 5 days, and as a result, the patient showed dramatic improvement and all his symptoms ameliorated shortly after steroid.

Case Report 2

A 15-month-old girl with presumed Diamond-Blackfan anemia had a delay in her vaccination (only received vaccine up to 4th month) and was not on steroid before. She presented with high-grade fever and chest infection (►Fig. 2) preceded with measles and with 5 days illness prior to her presentation during which she received vitamin A. All her cultures along with respiratory secretions multiplex study were normal. However, despite 1 week of broad antimicrobial therapy, she continued deteriorating requiring more oxygen to maintain her O₂ saturation. The ELISA for measles-specific IgM antibody was positive in addition to positive measles PCR from respiratory secretions. Based on this, she was diagnosed with MRP and 2 mg/kg/d methyl prednisolone was started for 5 days. Patient showed dramatic improvement and all her symptoms ameliorated shortly after steroid.

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Fig. 1 Chest radiograph for Case 1.

Discussion

The high mortality rate associated with MRP might be due to its immunosuppressive effects, multisystem involvement, and secondary bacterial infection.² Irrespective of the recent advancements in medicine, there are still no management guidelines except supportive treatment for MRP.

Corticosteroids, such as oral prednisolone, have proven to reduce inflammation in many diseases where it switches off genes responsible for activation of inflammatory process.³ Although there is no established treatment protocol, intravenous methyl prednisolone showed some positive results in adults with MRP but not in children.⁴ Nevertheless, a previous report from Sri Lanka showed a successful treatment for measles-related respiratory distress syndrome in a 10-month infant with intravenous immunoglobulin G, methyl prednisolone, and vitamin A given all together.⁵

Furthermore, a randomized controlled trial in the United States revealed that methyl prednisolone administration during early severe acute respiratory distress syndrome is associated with significant improvement in pulmonary and nonpulmonary organ dysfunction which in turn reduces the duration of mechanical ventilation.⁶

With this supportive evidence, we initiated treatment with prednisolone in both our patients. One of them was already on vitamin A but, due to vitamin A shortage, it was not given to the other one. Basic investigations indicated intact immunity for both of them. However, after initiation of

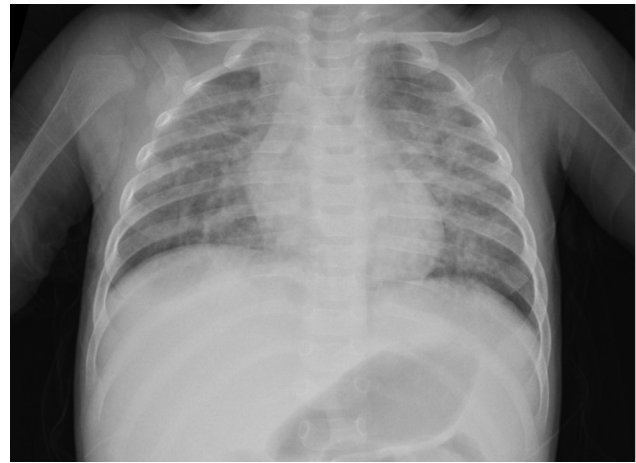


Fig. 2 Chest radiograph for Case 2.

oral prednisolone in one patient and intravenous methyl prednisolone in the other, the conditions of both patients significantly improved. This dramatic improvement after initiation of steroid as immunomodulatory support indicated that the complications of measles are due to the intense inflammatory response to viral replication, particularly in the respiratory tract, possibly compounded by downregulation of immune function.

Conclusion

Our patients were successfully treated with steroid. Rapid response to this treatment should be further investigated as a treatment regimen for MRP.

Conflict of Interest

None declared.

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