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Congenital Measles: A Case Report and Literature Review

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Abstract

Background: Before the vaccination era, the incidence of gestational measles was approximately 0.5 cases per 10.000 pregnancies. In 2017, low immunization rates led to an increase in measles cases and its complications.

Case presentation: We report a case of congenital measles who presented during a large community outbreak in Italy. Polyclonal intravenous immunoglobulin was administered to the infant. The newborn developed only a mild maculopapular rash without any further complications.

Conclusion: Thanks to the very effectiveness of vaccines, people may have forgotten the serious consequences of measles. This along with misinformation, has led to a decrement in vaccination coverage. Consequently, the measles outbreaks persist with their complications, such as congenital measles.

Keywords: Measles; Immunoglobulin; Epidemiological situation; Vaccine

Introduction

Measles is caused by the RNA virus family Paramyxoviridae genus Morbillivirus. Transmission of measles occurs mainly by respiratory secretions of an infected individual. The child is contagious from 2 days before to 5 days after the appearance of the exanthema. The incubation period is about 14 days. During the infection, it is possible to recognize a prodromal period (with fever, conjunctivitis, rhinitis, cough, enanthema), an exanthematic period (with a cranio-caudal, maculo-papular rash) and a period of convalescence. Possible complications are otitis media, pneumonia, keratitis, encephalitis, subacute sclerosing panencephalitis [1-3]. Owing to the lack of complete vaccination coverage, pregnant women and their offspring may be vulnerable to infection. We report a case of congenital measles who presented during a large community outbreak in Italy in 2016.

Case Presentation

On the fortieth gestational week, a 25-year-old woman developed low-grade fever, pharyngitis and conjunctivitis. On the next day, she underwent a cesarean section because of a constricting nuchal umbilical cord, with a reduction of fetal heartbeats. The infant weighed 3280 g (AGA) and the Apgar score was 8 and 10 at 1 and 5 min after birth, respectively. The baby had no signs of congenital infection. On neonatal day 1, the mother developed a maculopapular rash and high fever. She received only a single dose of the vaccine against measles at the age of 2 years, without receiving the second dose. Anti-measles IgM and IgG from maternal serum obtained on the day after delivery were both positive. Immediately, polyclonal intravenous immunoglobulin was prophylactically administered to the baby (400 mg/kg).

On neonatal day 6, the infant developed mild maculopapular rash on the face and the chest, without fever, conjunctivitis or others respiratory symptoms. The clinical diagnosis of measles, based on the history and the distinctive rash, was confirmed by the presence of measles-specific immunoglobulin M in blood and detection of measles virus by reverse transcription-PCR testing in saliva. Since the incubation period is 7-21 days, we thought that the baby was infected by the measles virus in utero. His rash resolved within 3 days without other complications related to measles.

Discussion

Measles is defined congenital when the rash occurs at birth or between 1-10 days of life, postnatal between 14-30 days [1]. Congenital measles is not correlated with a pattern of congenital malformations [1]. If acquired during pregnancy the infection would result in fetal complications, and the severity depends on the gestational age. Congenital measles is associated with abortions, stillbirths [2] and prematurity, whose risk increases by 31% [3].

In the newborn, the infection may result in a variable clinical picture, including asymptomatic form, skin rash, pneumonia, keratitis, gastroenteritis, with an increased mortality by about 27% without any treatment. A 16-fold increased risk of sub-acute sclerosing panencephalitis (SSPE) has been estimated [4].

In the newborn, due to the immaturity of the immune system and the delayed positivity of measles IgM, the serological tests are less sensitive. As a result, RT-PCR of salivary specimens is the "gold standard" for the diagnosis [5].

The vaccine (MMR) administered within 72 hours of exposure may supply some protection. However, it is not recommended before 6 months of life. If a newborn develops measles, he should prophylactically receive immunoglobulin: given within 6 days of exposure, it can prevent or modify the infection. The recommended dose is 0.50 mL/kg given intramuscularly (the maximum dose is 15 mL). Immunocompromised patients and newborn whose mothers received biologic response modifiers during pregnancy should receive 400 mg/kg intravenously [6]. In our case, the newborn did not develop any complications of measles, but only a mild maculopapular rash. However, we do not know the long-term effects of the infection. Moreover, for an easily preventable disease, about 9000 € was spent on hospitalization.

Although in our case the clinical picture was not serious, infants younger than 12 months are at particular risk, because on the one hand they are not vaccinated, on the other severe complications are possible. However, measles is a potentially eradicable disease because virus is genetically stable, there are no environmental or animals' reservoirs,

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asymptomatic contagious carries are not known to exist, infectivity is short, after infection immunity is permanent, there is a safe and effective vaccine [7]. On the other hand, measles is a highly contagious disease in nonimmune individuals and the herd immunity threshold is 95%. This threshold is necessary to ensure protection for people who cannot be vaccinated, such as newborns and immunosuppressed individuals.

In Italy, immunization against measles decreased from 91% in 2010 to 85% in 2016 [8], partly due to anti-vaxxer movement and press that spread incorrect information, such as the moderate severity of the disease or the association between the use of the measles vaccine and serious events like autism. However, this disease can give fatal complications and meta-analysis suggest that vaccinations are not associated with the development of autism or autism spectrum disorder [9].

Rarely, a hypersensitivity reaction occurs. For the period 1991-1997, Bohlke et al. described 5 cases of anaphylaxis after administration of 7,644,049 measles vaccine doses. They calculated a risk of 0.65 cases/million doses and none of the events resulted in death [10]. To make a comparison, for example in the USA, in the same period, there were over 300,000 cases of anaphylaxis due to peanut allergy that have caused the death of over 600 patients [11].

In June 2016, to contrast the low immunization rates and the increase in the number of cases of measles, the Italian Government passed a law that made vaccination for pertussis, diphtheria, tetanus, hepatitis B, *Haemophilus influenzae* type B, polio, measles, mumps, rubella and varicella mandatory from ages 1 to 16. Compared with 2016, the vaccine coverage for measles, mumps, and rubella increased 2.9% from June to October 2017 [12].

Conclusion

The incidence of gestational measles before the vaccination era was approximately 0.5 cases per 10.000 pregnancies [13]. In the post-vaccine era, the incidence has diminished considerably and congenital measles is infrequent. In fact, the high vaccination coverage causes herd immunity and the consequent protection against measles. However, the effectiveness of vaccine and misinformation may have contributed to the decrease in vaccination coverage. As a result, measles outbreaks continue to occur.

Christensen et al. [14] reported that 7 out of 22 cases of congenital measles on not receiving γ-globulin died. Our case with a mild clinical course of congenital measles confirmed that the immunoglobulin may modify or prevent measles [1], that is one of the serious complications during pregnancy.

This case confirms the importance of continuing vaccinations. In fact, herd immunity avoids the serious complications of the disease and the loss of resources.

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