Central Eur J Paed 2017;13(1):69-72.
DOI 10.5457/p2005-114.172

COMPLICATED MEASLES IN AN 8-MONTH OLD INFANT – A CASE REPORT

Ivona BUTORAC AHEL, Kristina LAH TOMULIĆ, Srđan BANAC

Department of Pediatrics, Clinical Hospital Center Rijeka, Croatia

Correspondence:
ivonabuah@gmail.com
Tel.: + 385 51 659 172
Fax.: + 385 51 623 126

Received: June 4, 2016
Accepted: September 16, 2016

Key words: Measles ▪ Child ▪ Laryngotracheobronchitis.

Objective – To present a case of measles complicated by laryngotracheobronchitis and severe respiratory distress, and to emphasize the importance of vaccination. **Case report** – The authors report the case of an 8-month-old infant with fever, rash and wheezing. The diagnosis of measles complicated by laryngotracheobronchitis was made. The infant was admitted to the paediatric intensive care unit with severe respiratory distress, and required support with mechanical ventilation. The patient recovered fully. No nosocomial measles infections were identified. **Conclusion** – This case highlights the need for rapid diagnosis, appropriate treatment and determination of vaccination status of children with measles, in order to prevent complications.

Introduction

Measles is a highly contagious exanthematic infectious viral disease caused by Morbillivirus, a single stranded enveloped RNA virus belonging to the family of Paramyxoviridae. Before the introduction of measles vaccine, measles was responsible for millions of deaths annually. In countries with high levels of measles vaccine coverage, measles occurs as a sporadic disease. Vaccine uptake higher than 95% in a population is crucial for eradicating measles (1-3). People who recover from measles have lifelong immunity, although a few cases of reinfection have been described (4). Approximately one third of reported measles cases have one or more complications. Complications of measles are most common among children younger than 5 years of age and adults 20 years of age and older (5). We present the case of an 8-month-old infant with measles complicated by severe laryngotracheobronchitis, and severe respiratory distress.

Case report

An eight-month-old female infant was admitted to the local hospital in May 2015 on the third day of disease characterized by temperature, cough and wheezing. She was born preterm at 31 gestational weeks from the eighth, uncontrolled twin pregnancy as the second twin. The birth weight was 1500 g, Apgar scores were 8 and 8 at 1 and 5 minutes, respectively. She had a history of recurring bronchitis. After admission, treatment with salbutamol and methylprednisolone was started and led to improvement of broncho-obstruction within 24 hours. She was afebrile and eupnoic for the next 2 days. On the fourth day of hospital stay she developed a fever again. She developed a facial rash, which proceeded to spread to her

trunk and limbs two days later. Conjunctivitis was present, but Koplik's spots were not observed. Clinical presentation was suggestive of measles and epidemiological data on measles were positive. The patient was exposed to an outbreak of the infection in an unvaccinated population. She had a history of contact with an aunt diagnosed with measles. The diagnosis of measles in our patient was confirmed by positive specific IgM antibody detection from serum samples, and positive Polymerase Chain Reaction (PCR) detection of the measles virus in pharyngeal and urine samples. On the seventh day of hospital stay the fever and cough persisted, and progressive dyspnoea and respiratory distress developed. The infant was transferred to the intensive care unit (ICU). On admission, the patient was febrile (38°C), tachycardic (175 beats/min), and tachypnoic (70 respirations/min), O_2 saturation was 87% and inspiratory stridor was present. The effort of breathing was markedly increased with nasal flaring and retractions. Auscultation revealed wheezing. The infant appeared ill, had bilateral conjunctivitis and a generalised erythematous macular-papular rash with confluence on the face and neck. Rigid bronchoscopy under general anaesthesia was performed. Extensive inflammation and oedema of the larynx, trachea and both main bronchi, with scarce amounts of non-suppurative secretion, were visualised. Bronchial aspirates were taken and microbiologically analysed. *Haemophilus influenzae* was isolated. PCR detection of measles virus from bronchial aspirate was not done. She was intubated and conventionally mechanically ventilated, and empirical antibiotic therapy with ceftriaxone was started. The child was placed in isolation. She was extubated 14 days after admission to the ICU. Antibiotic treatment with ceftriaxone was stopped after 10 days. Treatment with vitamin A was not given. The child was discharged home in a stable condition on day 31. No nosocomial measles infections were identified.

Discussion

The two age groups most severely affected by measles are infants younger than 1 year and adults older than 20 years. After the first six months of life, maternal specific antibodies disappear and infants become susceptible to develop measles infection. In healthy immunocompetent adults, the absence of vaccination is the leading cause of measles infection (5). Complications of measles can affect almost every organ system (Table 1) (6). The complication rate varies in Europe from 11% to 50% (7-9). Those at greatest risk of measles complications are: children younger than 5, pregnant women, adults and individuals with chronic diseases and impaired immunity (5). Several risk factors - immunosuppression, infancy, pregnancy, malnutrition, vitamin A deficiency, and gender - have been associated

Table 1 Complications associated with measles

Organ system	Complications
Respiratory	Otitis media, Mastoiditis, Laryngotracheobronchitis, Tracheitis, Pneumonia, Pneumothorax, Mediastinal emphysema
Neurological	Febrile convulsions, Encephalitis, Postinfectious encephalitis, Inclusion body encephalitis in immunocompromised persons, Transverse myelitis, Subacute sclerosing panencephalitis, Guillain-Barre' syndrome, Reye's syndrome
Gastrointestinal	Diarrhea, Appendicitis, Hepatitis, Pancreatitis, Stomatitis
Cardiovascular	Myocarditis, Pericarditis
Ophtalmic	Keratitis, Corneal ulceration, Corneal perforation, Blindness
Hematologic	Thrombocytopenic purpura, Disseminated intravascular coagulation
Dermatologic	Desquamation, Cellulitis
Other	Dehydration, Myositis, Hypocalcemia, Nephritis, Renal failure, Malnutrition, Death

with more severe presentations, higher admission rates and length of stay, and higher risk of being transferred to ICU, particularly among the infant group (7, 10).

Respiratory, neurological, gastrointestinal and ocular complications usually occur. Otitis media is the most common complication of measles. The most common causes of death in measles are pneumonia, laryngotracheobronchitis, and encephalitis. Encephalitis is the most common cause of long-term sequelae. Patients with measles who require intensive care have a high risk of death or long-term complications. Laryngotracheobronchitis is the second most common cause of death in children with measles, after pneumonia. It is usually the result of bacterial superinfection, most commonly caused by Staphylococcus aureus, the measles virus itself or by another superimposed bacterial infection. It occurs in 9%-32% of children infected with measles (6). The most affected children are younger than 2 years.

In the present case normal values of inflammatory markers, together with endoscopic visual findings, which revealed severe mucosal inflammation with scarce quantities of non-suppurative tracheobrochal secretion, suggested the viral nature of infection. However, the fact that *Haemophilus influenzae* had been isolated from bronchal aspirates, suggested that bacterial superinfection had followed primary infection with the measles virus. This was the reason why the patient was treated with cefrtiaxone for 10 days. Significant progress has been made globally in controlling measles since the mandatory measles vaccine was implemented in the national immunisation programme. The measles vaccine is safe and highly effective (11). In recent years the number of unvaccinated children has been increasing due to parental refusal and scepticism regarding the benefits and safety of the vaccination. Immunization coverage <95% and importation of measles from endemic countries contribute to measles outbreaks.

Our patient was part of one of the greatest epidemics of measles in Croatia in the last decade. According to the Croatian Health Statistics Yearbook in 2015, 206 measles cases were reported as a result of an outbreak that started in 2014 (12). The primary immunization coverage in 2015 was 92.8%, and total vaccination coverage was 95.8% (12). In Croatia, measles occurs sporadically as a result of imported infections or as limited outbreaks among unvaccinated or incompletely vaccinated populations.

Conclusion

Clinicians should retain measles in their differential diagnoses of febrile illnesses with rash. Sustained high vaccination coverage, early recognition of symptoms and prompt quarantine of patients with measles is crucial in order to prevent measles outbreaks.

Authors' contributions: Conception and design: IBA and KLT; Acquisition, analysis and interpretation of data: IBA, KLT, and SB; Drafting the article: IBA; Revising the article critically for intellectual content: SB, KLT and IBA; Approved final version of the manuscript: SB, and KLT.

Conflict of interest: The authors declare that they have no conflict of interest.

References

1. Moss WJ, Griffin DE. Measles. Lancet. 2012;379:153-64.
2. Tannous LK, Barlow G, Metcalfe NH. A short clinical review of vaccination against measles. JRSM Open. 2014 Mar [cited 2016 May 2];5(4). Available from:http://www.uk.sagepub.com/aboutus/openaccess.htm.
3. Carrillo-Santisteve P, Lopalco PL. Measles still spreads in Europe:who is responsible for the failure to vaccinate?. Clin Microbiol Infect. 2012;5:50-6.
4. Hamkar R, Mahmoodi M, Nategh R, Jelyani KN, Eslami MB, Mohktari-Azad T. Distinguishing be-

tween primary measles infection and vaccine failure reinfection by IgG avidity assay. East Mediterr Health J. 2006;12:775-82.

5. Perry RT, Halsey NA. The Clinical Significance of Measles: A Review. J Infect Dis. 2004;189:4-16.
6. Pulcini C, Massin S, Launay O, Verger P. Knowledge, attitudes, beliefs and practices of general practitioners towards measles and MMR vaccination in southeastern France in 2012. Clin Microbiol Infect. 2014;20:38-43.
7. Casasoprana A, Honorat R, Grouteau E, Marchou B, Claudet I. A comparison of adult and pediatric measles patients admitted to emergency departments during the 2008-2011 outbreak in the Midi-Pyrénées region of France. Jpn J Infect Dis. 2014;67:71-7.
8. Stanescu A, Janta D, Lupulescu E, Necula G, Lazar M, Molnar G et al. Ongoing measles outbreak in Romania, 2011. Euro Surveill. 2011[cited 2016 May5]; 16(31). Available from: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19932.
9. Filia A, Tavilla A, Bella A, Magurano F, Ansaldi F, Chironna M, et al. Measles in Italy, July 2009 to September 2010. Euro Surveill. 2011 [cited 2016 May 5];16(29). Available from: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19925.
10. Stein-Zamir C, Shoob H, Abramson N, Zentner G. Who are the children at risk? Lessons learned from measles outbreaks. Epidemiol Infect. 2012;140:1578-88.
11. Lindberg C, Lanzi M, Lindberg K. Measles: Still a Significant Health Threat. MCN Am J Matern Child Nurs. 2015;40(5):298-305.
12. Croatian Institute of Public Health. Croatian Health Statistics Yearbook 2015[in Croatian]. Zagreb: Croatian Institute of Public Health; 2016 [cited 2017 Sept 23]. Available from:http://hzjz.hr/wpcontent/uploads/2016/05/ljetopis_2015.pdf.