Reminder of important clinical lesson

A 6-year-old boy with fever, rash and severe pneumonia

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The authors report a 6-year-old boy with fever, rash and cough. He was diagnosed with severe measles pneumonia and admitted to the paediatric intensive care unit with severe dyspnoea 8 days after symptom onset. He received intravenous antibiotics and high dose vitamin A. Three days later, he had recovered and was discharged home. He had not been vaccinated for measles, mumps and rubella according to the schedule. This case highlights the need for rapid diagnosis, appropriate treatment and determination of vaccination status of children with measles in order to prevent complications.

BACKGROUND

Measles is one of the most communicable infectious diseases.^{1 2} Worldwide, there are an estimated 20 million cases and 197 000 deaths each year.³ Morbidity and mortality of measles has been markedly reduced through childhood immunisations.^{1–2 4} Current Thai guidelines recommend that all children receive two doses (9–12 months and 4–6 years) of MMR.⁵ Studies in Thailand have reported sporadic outbreaks in Bangkok and Chiang Mai orphanages.^{6 7}

Clinical manifestations of measles include fever, cough, coryza, conjunctivitis, an erythematous maculopapular rash and Koplik spots.² Complications include pneumonia (3–9% depending on age), otitis media, laryngotracheobronchitis, diarrhoea and acute encephalitis.^{2 8} An increased case death rate is associated with younger age (<5 years) and immunodeficiency, and often secondary to respiratory and neurologic complications.² The WHO treatment guidelines recommend vitamin A for all children

Figure 1 Photographs of child 8 days after symptom onset, and 3 days after rash onset.

Figure 2 Photographs of child 10 days after symptom onset, and 5 days after rash onset.

Figure 3 Chest radiographs: 8 days after symptom onset (3 days after rash onset; left) and 10 days after symptom onset (5 days after rash onset; right).

with acute measles regardless of their country of origin, administered daily for 2 days.¹ This case highlights the need for rapid diagnosis, appropriate treatment and determination of vaccination status of children with measles in order to prevent complications.

CASE PRESENTATION

A 6-year-old boy from northern Thailand developed rhinorrhea and a mild non-productive cough 8 days before admission to the Chiang Mai University Hospital (CMUH). Six days before admission to CMUH, he developed a tactile fever and was taken to a local clinic. He was prescribed a mucolytic and an antihistamine. Despite this treatment, his cough worsened and his fever persisted. Three days before admission to CMUH, he developed a facial rash, which proceeded to spread to his trunk (figure 1). On the day before

admission to CMUH his fever and cough persisted, and he was transferred to CMUH for severe respiratory distress and potential need for mechanical ventilation. He was diagnosed with measles pneumonia. The child had no medical or surgical history. He did not take any medications. His birth history was unremarkable. He had no known drug allergies. His vaccination history included: BCG vaccine; diphtheria, pertussis and tetanus vaccine; oral polio virus vaccine (three doses); and hepatitis B vaccine (three doses).

On the patient's admission to CMUH, he was febrile (39.5°C), tachycardic (110–120 beats/min) and tachypnoeic (40 respirations/min). The child appeared ill and had bilateral conjunctivitis, a normal oral pharynx, decreased breath sounds with fine crepitation throughout, mild subcostal retractions and a generalised erythematous macular-papular rash with confluence on face, trunk and extremities (figure 2).

INVESTIGATIONS

Complete blood count was notable for haemoglobin (10 grams/dl), haematocrit (29.4%) and a white blood cell count of 9900 cells/mm³ (neutrophils (41%), eosinophils (4%), lymphocytes (42%), monocytes (3%)). Measles IgM was reactive. Chest radiograph showed patchy infiltration in bilateral perihilar regions, without pleural effusion or cardiomegally (figure 3). Studies were completed 8 days after symptom onset. Blood cultures had no growth at 7 days.

DIFFERENTIAL DIAGNOSIS

Severe measles pneumonia with possible superimposed bacterial infection.

TREATMENT

Vitamin A oral daily was given for 2 days (200 000 units/day); intravenous amikacin for 3 days (270 milligrams/day) and cefotaxime for 7 days (2.8 grams/day).

OUTCOME AND FOLLOW-UP

The child was placed in isolation with respiratory precautions. He returned to baseline approximately 96 h after admission to CMUH, except for his rash, which evolved into a brown macular-papular rash. Intravenous antibiotics were stopped 3 days (amikacin) and 7 days (cefotaxime) after admission to CMUH. The child was discharged home in stable condition 7 days after admission to CMUH with a 1-week course of oral amoxicillin/clavulanate. No nosocomial measles infections were identified.

DISCUSSION

We present a 6-year-old undervaccinated boy who presented with severe measles pneumonia. Typically measles pneumonia should begin to resolve 3 days after rash onset, but in our case the child's respiratory symptoms worsened indicating an underlying possible bacterial infection and thus necessity for broad-spectrum antibiotics. We added the course of oral antibiotics (amoxicillin/clavulanate) because we would like to cover potential common bacterial infections such as *Streptococcus pneumoniae* and *Haemophilus influenzae* for a total of 10–14 days since Thai children are not routinely vaccinated against both organisms and this practice is stipulated by Thai vaccination guidelines.^{9 10} A retrospective review of 156 admitted children with measles from 1998 to 2002 in a Bangkok hospital found the most common complications to include pneumonia (62.2%) and diarrhoea (38.1%), with viral and bacterial causes of pneumonia, approximately equal.¹¹ The benefits of two doses of vitamin A on consecutive days have been associated with a reduction

in mortality in children under 2 years and reduction in pneumonia-specific mortality.¹²

Learning points

- ▶ Checking of a patient's immunisation is crucial at every healthcare encounter, especially in immunocompromised patients. In this case, before presentation the child needed vaccinations for measles, mumps, rubella and Japanese encephalitis.
- ▶ Measles is a clinical diagnosis with Koplick spots being pathognomonic.² Healthcare workers should be aware of the classic presentation, as multiple providers missed the diagnosis.
- ▶ After diagnosis, swift treatment and patient isolation with respiratory precautions must be implemented to prevent subsequent complications and spread.

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Competing interests None.

Patient consent Obtained.

REFERENCES

1. American Academy of Pediatrics. Measles. In: Pickering LK, Baker CJ, Kimberlin DW, Long SS, eds. *Red Book: 2009 Report of the Committee on Infectious Diseases*. 28th Edition. Elk Grove Village, Illinois: American Academy of Pediatrics 2009:444–55.
2. **Maldonado YA**. Rubella Virus. In: Long SS, Pickering LK, Prober CG, eds. *Principles and Practice of Pediatric Infectious Diseases*. Third Edition. Philadelphia, PA: Elsevier 2008:1120–6.
3. Measles. Centers for Disease Control and Prevention at <http://www.cdc.gov> (accessed 17 November 2011).
4. The measles initiative vaccinates one billion children in first decade. World Health Organization at <http://www.who.int> (accessed 28 November 2011).
5. Vaccination program. Pediatric Infectious Disease Society of Thailand at <http://www.pidst.net> (accessed 8 August 2011).
6. **Lertpiriyasuwat C**, Kanlayanpotporn J, Deeying J, *et al*. Measles outbreak in an orphanage, Bangkok, Thailand, September–October 2000. *J Med Assoc Thai* 2002;**85**:653–7.
7. **Aurpibul L**, Puthanakit T, Kanjanavanit S, *et al*. Measles outbreak in an orphanage: HIV-infected children on antiretroviral therapy are still at risk. *Pediatr Infect Dis J* 2010;**29**:167–9.
8. **Perry RT**, Halsey NA. The clinical significance of measles: a review. *J Infect Dis* 2004;**189** (Suppl 1):S4–16.
9. Haemophilus influenza type B vaccine (Hib). In: Wathanaviradej V, Tangsataporn A, Chockpaibulkit K, eds. *Vaccination 2012–2013 and Common Problems*. Bangkok: Beyond Enterprise 2012:232–41.
10. Pneumococcal vaccine (Pnc). In: Wathanaviradej V, Tangsataporn A, Chockpaibulkit K, eds. *Vaccination 2012–2013 and Common Problems*. Bangkok: Beyond Enterprise 2012:242–62.
11. **Ariyasriwatana C**, Kalayanaroj S. Severity of measles: a study at the Queen Sirikit National Institute of Child Health. *J Med Assoc Thai* 2004;**87**:581–8.
12. **Huiming Y**, Chaomin W, Meng M. Vitamin A for treating measles in children. *Cochrane Database Syst Rev* 2005;**4**:CD001479.

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