MACROLIDE RESISTANT PERTUSSIS IN AN INFANT WHOSE MOTHER WAS NOT VACCINATED AGAINST PERTUSSIS

P.Krol¹, O.Thomas², C.Webb¹, U.Tinghäll Nilsson¹, L.Lindberg², P.Nilsson Wimar¹, U.Tedgård³
1 Skåne University Hospital, Dept. Of Paediatrics and Adolescent Medicine, Lund, Sweden, 2 Skåne University Hospital, Dept. Of Paediatric Anaesthesia and Intensive Care, Lund, Sweden, 3 Skåne University Hospital, Dept. Of Paediatric Haematology and Oncology, Lund, Sweden

CASE REPORT

- a 6 week-old boy admitted to local hospital
- initial symptoms of cough, problems with eating and fatigue
- mother with similar symptoms – not vaccinated in childhood
- diagnosis of pertussis 1 week after initial symptoms
- 10-day course of erythromycin
- **admitted to PICU and intubated due to respiratory collapse 4 days after finishing antibiotic-course**
- continues with erythromycin+cefotaxime initially
- day 3 on PICU deterioration with tachycardia, dyspnea, leukocytosis and elevated CRP (Graph 1 and 2)
- 2 blood exchange transfusions on day 3 and 4 due to extreme leukocytosis. Good effect (see Graph 1)
- slow clinical/laboratory improvement from day 7

INVESTIGATIONS

- laboratory tests (Graph 1 and 2)
- microbiology - **B.Pertussis DNA** in secretions/expectorate
- other bacterial, viral and fungal tests negative
- serology - **B.pertussis toxin IgG, IgA** positive
- immunology tests – **IL-6 217ng/L** (<8ng/L), immunoglobulins and lymphocyte subclasses normal
- chest X-ray – **bilateral pneumonia with atelectasis**
- echocardiogram – signs of **pulmonary hypertension**

Graph 1. Trend of leukocytes during infection. Labeled points show when patient received blood exchange transfusion.

Graph 2. CRP levels during infection days after transfer to PICU.

TREATMENT

- 23 days of antibiotic treatment (erythromycin, cefotaxime, azithromycin, meropenem, trimetoprim-sulfomethoxazol)
- 2 blood exchange transfusions due to leukocytosis
- 1 dose of intravenous immunoglobulin (1g/kg)
- 16 days of mechanical ventilation
- 11 days high-flow nasal therapy (Optiflow)

WHY DID INITIAL TREATMENT FAIL?

- 1) **Secondary infection?** All cultures negative
- 2) **Test for antibiotic resistance? POSITIVE** (Table 1)

Mutation A2037G
MACROLIDE-RESISTANT *Bordetella pertussis*
(source: K Tegmark Wisell et al., The Public Health Agency of Sweden)

Klaritromycin: >256 g/mL
Erytromycin: >256 g/mL
Azithromycin: >256 g/mL
Trim-sulfa: 0.064 g/mL
Ciprofloxacin: 1 g/mL

Table 1. Minimal inhibition concentration (MIC) for antibiotics.

DISCUSSION

- 1) The vaccination of pregnant women can significantly decrease the risk of pertussis infection in neonates and infants (1)
- 2) Usual treatment with antibiotics can fail due to bacterial resistance (2)
- 3) Other treatment modalities in severe cases of pertussis infection with complications (3)

(1) *Tetanus, diphtheria, and acellular pertussis vaccination during pregnancy and reduced risk of infant acute respiratory infections.* Khodr ZG et al. Vaccine. 2017 Oct 9;35(42):5603-5610.
(2) *Macrolide-resistant Bordetella pertussis infection in newborn girl, France.* Guillot S. et al. Emerg Infect Dis. 2012 Jun;18(6):966-8.
(3) *Novel therapies for the treatment of pertussis disease.* Karen M. Scanlon et al. FEMS Pathogens and Disease, 73, 2015