

Neonatal early onset sepsis due to *Moraxella osloensis*: Case-report and revision of the literature

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Abstract

We report the first case of early-onset systemic neonatal infection associated with *Moraxella osloensis* bacteriemia in a full term baby. The genus *Moraxella* is constituted by a group of pleomorphic bacteria obligate aerobes, Gram-negative, oxidase positive and indole negative infrequently isolated from clinical specimens. The organism is rarely reported in the literature as the causative agent of infection in humans, mostly in immunocompromised patients. Only 12 cases of *M. osloensis*-related infections during childhood have been reported in the literature so far. This unique report of *M. osloensis* infection, during the neonatal period, concerns the isolation of the bacteria in purulent secretions from the eyes of a 3-week-old baby with ophthalmia. In our patient, the precocity of the onset of symptoms allows us to hypothesize a vertical transmission of the bacteria.

Key words: *Moraxella*, newborn, sepsis

Introduction

The genus *Moraxella* is constituted by a group of pleomorphic bacteria obligate aerobes, Gram-negative, oxidase positive and indole negative, infrequently isolated from clinical specimens: the main species (*M. catarrhalis*, *M. nonliquefaciens*, *M.* and *M. lincolnii osloensis*) colonize as saprophytes the upper respiratory tract and occasionally the skin and urogenital tract in humans. (1-3) The clinical significance of *M.osloensis* isolates may be difficult to determine, because the organism is rarely reported in the literature as the causative agent of infection in humans, mostly immunocompromised patients. (4) We report the first case of early-onset systemic neonatal infection, most likely due to vertical transmission of *M. osloensis*.

Case report

The patient is a Caucasian male born vaginally at 39 weeks gestational age. The mother had no history of premature rupture of membranes. Maternal swabs of the lower vagina and rectum had not been performed during pregnancy; incomplete intrapartum prophylaxis against group B streptococcus infection was administered (Ampicillin 2 g intravenously, only the first dose). There was no other obstetric or family history of interest except for a 3-year-old brother who had received empirical intravenous antibiotic treatment in the first few days of life (no clinical data available).

The neonate's weight, length, and cranial circumference at birth were 4330 g (LGA, large for gestational age), 53.6 cm (LGA) and 34.8 cm (AGA, adequate for gestational age). APGARs were 9 and 10, at 1 and 5 minutes, respectively. At the first neonatal physical examination, no congenital malformations were detected.

One hour after birth the patient developed bradycardia (frequency rate 90 bpm) and respiratory distress requiring oxygen therapy; lung and cardiac auscultation were normal; no significant findings of other organs were detected on examination.

Laboratory workup revealed an increased C-reactive protein (0.032 g/l; reference values < 0.005 g/l); full blood count showed a normal white blood cell count and normal values for hemoglobin and platelets; urinalysis was negative.

Following blood culture, on a single sample (with enriched broth), the patient was given empiric intravenous antibiotic treatment with ampicillin+sulbactam. On the second day, blood tests revealed a further rise of C-reactive protein (0.05 g/l).

During the following days, blood biochemistry showed a progressive reduction of inflammatory markers and a gradual improvement of the baby's clinical condition was observed.

The newborn was discharged from hospital in good clinical condition ten days later, after completing antibiotic treatment.

On the fifth day after collection, the blood culture came back positive; the day after, subculture plates (blood agar and chocolate agar) showed a Gram negative coccobacillus usually not found on the plate for Gram-negative bacteria (MacConkey agar). At first biochemical identification (instrumental Phoenix Becton Dickinson and manual Biomerieux API NH), a bacteria belonging to the genus *Moraxella* was isolated. To obtain a definitive identification of the species of the organism, 16S rRNA gene sequencing was performed and the blood isolate in the present case was confirmed to be *M. osloensis*. Our patient's *M. osloensis* isolate was susceptible to ampicillin+sulbactam.

Discussion

Moraxella osloensis is rarely reported in the literature as the causative agent of infection in humans. The current medical literature on *Moraxella osloensis* essentially comes from case reports of infections in humans (osteomyelitis, meningitis, pneumonia, bacteriemia), in immunocompromised patients with malignancies. (4-7)

Regarding isolation of the bacteria in the pediatric population, only 12 cases of *M. osloensis*-related infections in patients aged 0 to 15 years have

been reported in the literature so far. (7-10) Among them, underlying conditions (complement C8 β deficiency and cerebrospinal fluid shunt) were present only in two children who both developed meningitis; in the ten remaining pediatric patients the medical history was unremarkable. The most recent cases of *M. osloensis* concerned a 6-year-old Indian boy with diarrhea and hemolytic uremic syndrome (8) and a 12-year-old Spanish girl with pyomyositis. (9)

We report the first case of early-onset systemic neonatal infection with *M. osloensis* in a full term baby. To our best knowledge, no neonatal *M. osloensis* bacteriemias have been described up until now. This unique report of *M. osloensis* infection during the neonatal period concerns the isolation of the bacteria from purulent eye secretions in a 3-week-old baby with ophthalmia. (10) In our patient, the precocity of the onset of symptoms (only one hour after birth) allows us to hypothesize a vertical transmission of the bacteria.

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Article printed from Signa Vitae: <http://www.signavitae.com>

URL to article: <http://www.signavitae.com/2015/12/neonatal-early-onset-sepsis-due-to-moraxella-osloensis-case-report-and-revision-of-the-literature/>

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