Plesiomonas shigelloides
septicemia and meningitis
in a neonate

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CASE REPORT

Plesiomonas shigelloides was originally isolated in 1947 by Ferguson and Henderson (1) who noted certain antigenic similarities between it and Shigella. The organism was designated C27 and considered a member of the family Enterobacteriaceae. It was later called Aeromonas. The genus Plesiomonas currently resides in the family Vibrionaceae. P shigelloides is a facultatively anaerobic, Gram-negative, oxidase-positive, motile rod. It is readily isolated on enteric media as a lactose non-fermenter. The primary natural reservoirs are soil, surface water and fish, especially shellfish such as oysters (2). Infections with P shigelloides often cause gastroenteritis, but it has been associated with septicemia, cellulitis, arthritis, cholecytitis, osteomyelitis and meningitis (3,4). Most infections with this organism have been described in Japan (where a great deal of shellfish is eaten), in the Indian subcontinent and in Africa.

The vast majority of Caucasians infected with this bacterium have been travellers to high risk areas or those who have recently eaten raw shellfish. A case of P shigelloides sepsis in a neonate with complications of endophthalmitis and multifocal intracerebral abscesses is described. To the best of our knowledge this is the first reported case of neonatal P shigelloides infection in Canada.

CASE PRESENTATION

A male was born to a healthy mother whose membranes were artificially ruptured 16 h before delivery. Delivery was induced at 36 weeks because of a previous intrauterine death at 38 weeks. The Apgar scores were 8 at 1 min and 9 at 5 mins, and the baby weighed 3410 g (90th percentile).

The mother had intermittent diarrhea throughout her preg-
nancy that was attributed to iron prescribed for anemia. Two weeks before the induction of labour following a regular sushi dinner, her diarrhea became worse, and she required intravenous rehydration in an emergency room. This worsening of the diarrhea lasted for 10 days. At that time the iron was still thought to be the cause of the bowel problems.

During the first day of life, the baby was a little restless and fed poorly. At 24 h of age he was febrile at 37.7°C, with a vasculitic type rash on his back. A blood culture and complete blood count were taken, and treatment started with intravenous ampicillin (100 mg/kg/day) and gentamicin (5 mg/kg/day). The total leukocyte count was 6.69×10⁹/L with 0.97×10⁹/L granulocytes and 0.25 bands with a platelet count of 192×10⁹/L. Within an hour he became irritable and hypertonic. A lumbar puncture was performed to complete the sepsis work-up. Cefotaxime (150 mg/kg/day) treatment was commenced immediately after the cerebrospinal fluid (CSF) was taken. CSF contained 6600×10⁶/L leukocytes (97% granulocytes), 2600×10⁶/L red blood cells and a protein concentration of 2.92g/L. CSF Gram stain showed abundant Gram-negative rods. A repeat blood count at that time revealed progressive neutropenia and thrombocytopenia (21×10⁹/L). A Gram-negative bacterium with coliform morphology was detected in a blood culture (Bactec 9240 medium, Becton Dickinson Diagnostic Instruments Systems, Maryland). In addition CSF yielded the same bacterium, which was oxidase-positive. The organism was presumptively identified as *P. shigelloides* on the basis of a biochemical assessment with a replica plating technique. Further assessment with the API 20E identification system (Bio Mérieux, Missouri) confirmed the speciation. Susceptibility to cefotaxime, ceftriaxone, cotrimoxazole and gentamicin was established, with resistance to ampicillin. Treatment was continued with cefotaxime and gentamicin. A fecal culture taken from the mother three days postpartum failed to grow any pathogens, and this assessment included a direct search for *P. shigelloides*.

At 26 h of age the baby had repeated seizure activity and required treatment with phenobarbitone, phenytoin and lorazepam. Mechanical ventilation was required. Clinical examination of the pupils revealed a white opacity on the right side. Ophthalmic examination the following day confirmed the presence of endophthalmitis with purulent exudate coating the anterior of the lens and iris. A cranial ultrasound on day 2 revealed multiple focal areas of increased echogenicity in the frontal lobes and cerebellar folia. Subsequent computed tomography (CT) scans on day 4 revealed white matter edema, and on day 21 revealed multifocal intracerebral cystic and solid lesions (Figure 1). At one month of age a ventriculoperitoneal shunt was inserted for relief of obstructive hydrocephalus, and a 5×5 cm frontal lobe abscess was drained. Microscopic examination of the abscess material demonstrated necrotic brain tissue. No bacteria were seen, and subsequently there was no growth on culture. Antibiotic treatment was continued for a total of six weeks. The child survived to discharge at the age of two months with signs of severe neurological damage. Ophthalmic infection resolved, but examination at three months revealed a vitreous condensation over the optic nerve head.

Figure 1) Computed tomogram of the cranium: large frontal and multifocal intracerebral abscesses in a neonate infected with *Plesimona shigelloides*.
DISCUSSION

Plesiomonas is a rare cause of neonatal sepsis and meningitis with high morbidity and mortality. To the best of our knowledge only 10 other cases have been reported (4-13). The probable source of infection in this case was the intestinal infection of the mother. The baby acquired the organism perinatally rather than in utero, given the time of onset of symptoms. This neonate never had diarrhea. Plesiomonas infection causing gastroenteritis in adults is well described and is usually a self-limiting diarrheal illness (14). A total of 24 such cases were reported in British Columbia in 1994 (15).

P. shigelloides may be resistant to ampicillin but is uniformly susceptible to third-generation cephalosporins, particularly cefotaxime (10,11,16). Five of the 10 previously described cases received cefotaxime as one of their antibiotics; four survived and three had no sequelae. Among the five patients who did not receive cefotaxime, there was only one survivor, a child who was treated with penicillin G and gentamicin and suffered no sequelae (7). The others received either a combination of ampicillin and an aminoglycoside, or rifampicin. P. shigelloides in the present case was resistant to ampicillin. Cefotaxime was added as soon as meningitis was suspected.

Endophthalmitis caused by P. shigelloides was previously described in one case, but it was acquired with a penetrating fishhook injury and necessitated enucleation (17). It seems that this is a most unusual localization of neonatal bacterial infection, but it is consistent with a high bacterial load in the bloodstream, as indicated by the early onset of vasculitic rash and thrombocytopenia in the present case. Infection resolved without intraocular administration of antibiotics. Brain abscesses are an unusual complication of meningitis and multiple abscesses even more so. We attributed this complication to ampicillin and an aminoglycoside, or rifampicin. P. shigelloides in the present case was resistant to ampicillin. Cefotaxime was added as soon as meningitis was suspected.

For an organism that is often described as a sporadic cause of a self-limiting diarrheal illness, plesiomonas must be regarded as highly virulent in the neonate.

ACKNOWLEDGEMENTS: We thank Dr David Scheifele and Dr Nevio Cimolai for their help in compiling this report.

REFERENCES

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