

***Pasteurella multocida* Septicemia in a Newborn without Scratches, Licks or Bites**

Deganit Cohen-Adam MD, Nufar Marcus MD, Oded Scheuerman MD, Vered Hoffer MD and Ben Zion Garty MD

Department of Pediatrics B, Schneider Children's Medical Center of Israel, Petah Tiqva, Israel
Affiliated to Faculty of Medicine, Tel Aviv University, Ramat Aviv, Israel

Key words: *Pasteurella multocida*, neonate, household pets, meningitis, septicemia

IMAJ 2006;8:657-658

Pasteurella multocida infection in newborns is associated with significant morbidity and mortality [1,2]. The bacteria are usually transmitted to humans from domestic animals by bites. This report emphasizes the risk of infection on exposure to household pets in the neonatal period, even without direct contact.

Patient Description

A 4 week old girl presented with fever of 1 day's duration, irritability and decreased appetite. She had been born at term, after an uncomplicated pregnancy and delivery. Birth weight was 3150 g. On admission, temperature was 39.4°C, heart rate 210/minute, respiratory rate 40/minute, and blood pressure 87/50 mmHg. Physical examination, including neurologic examination, was unremarkable. Laboratory tests showed a white blood cell count of 6700/mm³ with 4600/mm³ neutrophils; hemoglobin 11.9 g/dl, and platelets 365,000/mm³. C-reactive protein level was 1 mg/dl (normal 0-0.5 mg/dl); blood chemistry (SMA-18) and urinalysis revealed no abnormalities. Cerebrospinal fluid analysis yielded 6 WBC/mm³ with normal glucose and protein concentrations. Blood, CSF, and urine cultures were taken. The patient was treated with the usual empiric regimen of ampicillin (100 mg/kg/day) and garmycin (5 mg/kg/day).

On the third hospitalization day, there was no alleviation of the fever, the patient was irritable and refused to eat, and the anterior fontanel became prominent. Urine and CSF cultures were found to be negative, but blood culture yielded

a gram-negative Coccobacillus. WBC count increased to 22,000/mm³ with 60% neutrophils, and C-reactive protein level increased to 18 mg/dl. A second lumbar puncture yielded turbid CSF containing 2900 leukocytes (predominantly polymorphonuclear cells), with glucose 35 mg/dl (normal 40-75) and protein 122 mg/dl (normal 5-60). Gram staining and cultures of the CSF were negative.

A diagnosis of gram-negative sepsis with partially treated meningitis was made. In addition, the possibility of meningo-encephalitis due to herpes simplex virus was considered. Therefore, treatment was changed to cefotaxime (200 mg/kg/day), ampicillin (200 mg/kg/day), and acyclovir (60 mg/kg/day). Polymerase chain reaction analysis for herpes type 1 and 2 was negative, and the acyclovir was stopped. The gram-negative Coccobacillus in the blood was identified as *Pasteurella multocida*. At that point, re-questioning of the parents revealed that they owned a dog and a cat, but there had been no direct contact between the infant and the animals, not licking, biting, or scratching. However, the mother and grandmother who took care of the child also tended to the animals.

On the sixth hospitalization day, the patient's condition improved. Temperature normalized, C-reactive protein level decreased to 1.5 mg/dl, and WBC count returned to normal levels. Repeated lumbar puncture showed 80 WBC/mm³, and CSF culture was negative. Antibiotic treatment was discontinued after 2 weeks. There was no evidence of sequelae on neurologic examination or imaging tests, including brain ultrasonography and magnetic resonance imaging. Findings

on electroencephalography and auditory brainstem response were normal. At the 6 month follow-up no neurologic disorders were observed.

Comment

Pasteurella multocida is a gram-negative Coccobacillus that is part of the normal flora of the nasopharynx of many domestic and wild animals. Carriage rates are high among cats (70-90%), dogs (55%), and pigs (50%) [3,4]. Human infection with *Pasteurella multocida* is usually the result of transmission from animals, especially in children. It is most commonly recognized as a cause of cellulitis following animal bites [3].

Cellulitis due to a cat bite is more common than from a dog bite because cats inflict puncture-like skin lesions whereas a dog bite usually tears the skin [3]. In addition to wound infection, *Pasteurella multocida* infection can also cause serious systemic diseases, such as septicemia, septic arthritis, osteomyelitis, endocarditis, meningitis, and brain abscess [1-4]. Meningitis occurs more frequently in infants and the elderly [5]. In the present case, we assumed that meningitis, which was discovered in the second lumbar puncture, might also be infection with *Pasteurella multocida* caused by hematogenous dissemination from the blood.

No route of transmission of the infection was demonstrated in our patient. The family denied direct contact between the pets and the baby. We suggest that the bacteria became colonized on the infant after contact with the hands of a family member, and then progressed to septicemia and meningitis.

Apart from the present patient, 25

WBC = white blood cells
CSF = cerebrospinal fluid

cases of *Pasteurella multocida* meningitis in children under age 1 year have been reported in the literature to date [1-4]; 18 were newborns and 17 were males. Twelve of the affected infants were exposed to dogs, 9 to cats, and 4 to both. It is important to emphasize that only 2 of the infants had a history of animal bites or scratches and 16 were known to be exposed to the saliva of the animal by licking. There are some reports of neonatal meningitis caused by vertical transmission of *Pasteurella multocida* from vaginally colonized mothers. The youngest reported infant with *Pasteurella multocida* infection was 2 days old at diagnosis, and he was assumed to have been infected at birth, since the bacteria were isolated from the maternal vaginal secretions.

Neurologic sequelae were common

after *Pasteurella multocida* meningitis, including seizure disorders, hemiparesis, and hydrocephalus. Two of the infants died. Unlike these cases, however, our patient, who received antibiotic treatment very early in the course of the disease, recovered fully and had no short-term neurologic complications.

Third-generation cephalosporin is the drug of choice for *Pasteurella multocida* meningitis. However, prevention is always better. Simple hygienic measures such as hand washing may prevent the transmission of the organism from colonized animals to young infants.

References

1. Webber DJ, Wolfson JS, Swartz MN, Hooper DC. *Pasteurella multocida* infections. *Medicine* 1984;63:133-54.
2. Wade T, Teare EL, Kroll S. *Pasteurella multocida* meningitis in infancy (a lick may be as bad as a bite). *Eur J Pediatr* 1999;158:875-8.
3. Oewn CR, Burker ED, Bell JF, et al. *Pasteurella multocida* in animal's mouths. *Rocky Mountain Med J* 1968;64:64-5.
4. Hirsh D, Farrel K, Reilly C, Dobson S. *Pasteurella multocida* meningitis and cervical spine osteomyelitis in a neonate. *Pediatr Infect Dis J* 2004;23:1063-4.
5. Kumar A, Devlin R, Velland H. *Pasteurella multocida* in an adult: case report. *J Clin Pathol* 2000;53:234-5.

Correspondence: Dr. B.Z. Garty, Dept. of Pediatrics B, Schneider Children's Medical Center of Israel, Petah Tiqva 49202, Israel.
Phone: (972-3) 925-3681
Fax: (972-3) 925-3135
email: gartyb@clalit.org.il