

LISTERIA NEONATAL INFECTION

Abdul Hakiem Kattan, MD; Khalid Saidy, MBBS

Listeriosis is an uncommon but serious infection that occurs sporadically or in epidemics, and has a special predilection for pregnant women, neonates,^{1,2} elderly persons, or immunocompromised patients. *Listeria monocytogenes* is a gram-positive bacilli, which presents as a flu-like symptom in the pregnant mother, and has an estimated rate of attack of 12.4 cases perinatally per 100,000 live births in the USA. It can also induce stillbirth or abortion. The source of infection is usually animals, through contamination of food, undercooked meat or chicken,³ vegetables, milk and milk products.¹ Also, a cross-infection at neonatal units from one patient to another has been reported.⁴

Diagnosis is best made by routine bacterial culture of specimens from usually sterile sites, such as blood or cerebrospinal fluid. Stool culture is not reliable because enteric colonization with *L. monocytogenes* without invasive disease is known. Serologic testing is not useful in diagnosing listeriosis.⁵ In this article, we present a case of perinatal listeriosis, the first detected at King Faisal Specialist Hospital and Research Centre since 1976, and the only case reported from the Riyadh region. We discuss the diagnosis and brief reports from other areas.

Case Report

A premature baby girl, born to a 30-year-old Saudi mother with a very poor obstetrical history, was referred to King Faisal Specialist Hospital and Research Centre from the Al Qassim region. The mother was gravida 4, with two early neonatal deaths and one premature delivery, but no living children. The mother presented with a high-grade fever at 25 weeks of gestational age. She was admitted to the hospital, and treated with Mefoxin after cultures were sent for suspected sepsis. The mother was in a septic condition. She had an emergency C-section for moderately severe antepartum hemorrhage. After birth, the patient needed active resuscitation, including intubation and chest

compressions for 30 seconds. Her condition improved after this, with Apgar scores of 2 and 7 at one and five minutes, respectively. The birth weight was 630 grams, and the patient was immediately admitted to the NICU, where she had respiratory difficulties with sepsis, in addition to severe prematurity with hypotensive episodes, thrombocytopenia, and disseminated intravascular coagulation (DIC). Blood cultures grew gram-positive rods, *Listeria monocytogenes*. The same organism had been cultured from the mother's blood prior to the delivery, and was reported initially as diphtheroids. The organism was cultured from the blood, urine, and vaginal swab of the mother. The baby was treated with high doses of ampicillin 100 mg/kg twice a day, and gentamycin 2.5 mg/kg once a day for synergistic effect, and to maintain therapeutic blood levels. The patient also required multiple platelet transfusions and fresh frozen plasma, as well as packed red blood cells for the hypotension episodes, and to normalize her disturbed coagulation profile. Lumbar puncture was attempted twice in the early days of admission, but was unsuccessful. The antibiotic treatment continued for three weeks to cover the possibility of missed meningitis. Blood cultures came back sterile on the third day after admission. Other problems encountered during her stay in the NICU included severe respiratory distress syndrome. She received three doses of Exosurf, and was mechanically ventilated for a total of six weeks for chronic lung disease. She needed supplemental oxygen for another four weeks before she was weaned to room air.

With regards to the central nervous system, the patient had developed a grade 3 intraventricular hemorrhage (IVH) bilaterally, manifested by seizure (generalized tonic attacks) on her fourth day, which was treated with phenobarbital for eight weeks. EEG on day six was normal for age. Follow-up ultrasound of the head at discharge showed no evidence of leukomalacia or hydrocephalus.

The patient also had grade III retinopathy of prematurity, which regressed spontaneously over the period of hospitalization. After a total of 125 days of care in the NICU, and with a weight of 2.3 kg, the patient was discharged on diuretic treatment, hydrochlorothiazide and spironolactone, as well as vitamin and iron supplements. She was followed up regularly at the outpatient clinics, and at her last attendance, was a healthy-looking 15-month-old

From the Department of Pediatrics, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia.

Address reprint requests and correspondence to Dr. Kattan: Department of Pediatrics, King Faisal Specialist Hospital and Research Centre, MBC-58, P.O. Box 3354, Riyadh 11211, Saudi Arabia.

Accepted for publication 17 August 1997. Received 13 May 1997.

child, walking independently and saying a few words. No major difficulties were demonstrated at this stage. She will need further follow-up and assessment of her neurological outcome.

Discussion

The patient's mother stated that she had been consuming raw cow's milk from the farm, and had also been taking care of sheep at their home for an extended period. This points to the probability of infected animals being the source of the infection. It is unclear if the previous history of two neonatal deaths and premature deliveries were related to listeriosis.

Fetal wastage and premature deliveries are known complications of perinatal listeriosis.² *Listeriosis monocytogenes* is a frequently reported pathogen in many statistical data of perinatal infections of many countries, but not Saudi Arabia. Different dietary habits, with less consumption of undercooked meats and raw cheese, may explain the low attack rates, but we do not have accurate statistics for the incidence rate of listeria infection in Saudi Arabia. There are occasional reports indicating sporadic cases from the Eastern region,⁶ but reports from epidemiological studies about neonatal sepsis from the Riyadh region did not include any cases of *Listeria monocytogenes* as a cause of infection in this group of patients.⁷⁻⁹ This may indicate a low rate of infection, or a problem with detection methods, especially in rural areas where obstetrical and neonatal services may not be well oriented or equipped to search for such diagnoses. Dhar¹⁰ reported nine cases of neonatal listeriosis from Kuwait over an 18-month-period between February 1985 and July 1986. The attack rate of perinatally acquired *Listeria* infection is reported to be 12.4 cases per 100,000 live

births in 1986, and as high as 17.4 cases per 100,000 live births in 1989 in the USA. The attack rate had decreased to 8.6 cases per 100,000 births in 1993 due to the implementation of regulation to help control food-borne transmission of *Listeria monocytogenes*.¹¹

Knowing the incidence rate of this infection in Saudi Arabia is necessary to determine the need for similar control measures. *Listeria* infection is not one of the reportable diseases, according to the list at the Epidemiology Center at the Ministry of Health in Riyadh. Including this disease in the Ministry's list of reportable diseases may help to highlight the magnitude and localization of the problem in Saudi Arabia, and also help in the implementation of the necessary control measures.

References

- Schlegh WF, Lavigne PM, Bortolussi RA, Allen AC, Haldane EV, Wart AJ. Epidemic listeriosis: evidence for transmission by food. *N Eng J Med* 1983;308:203-6.
- Cherubin CE, Appleman MD, Heseltine PNR, Khayr W, Stratton CW. Epidemiological spectrum and current treatment of listeriosis. *Rev Infect Dis* 1991;13:1108-14.
- Bortolussi R. Neonatal listeriosis. *Semin Perinatol* 1990;14:44-8.
- Pejaver RK, Watson AH, Mucklow ES. *J Infect* 1993;26:301-3.
- Jones D. Foodborne listeriosis. *Lancet* 1990;336:1171-4.
- Mohammed CK. Listeriosis. *ARAMCO Epidemiol Bull* 1983;21/23:1-4.
- Haque KN, Chagia AH, Shaheed MM. Half a decade of neonatal sepsis, Riyadh, Saudi Arabia. *J Trop Pediatr* 1990;36:20-3.
- Ohlsson A, Serenikus F. Neonatal septicemia in Riyadh, Saudi Arabia. *Acta Paediatr Scand* 1981;70:825-9.
- Ohlsson A, Bailey T, Takiyeddine F. Changing etiology and outcome of neonatal septicemia in Riyadh, Saudi Arabia. *Acta Paediatr Scand* 1986;75:540-4.
- Dhar R. Neonatal listeriosis: report of nine cases from Kuwait. *J Trop Pediatr* 1988;34:118-24.
- Tappero JW, Schuchat A, Deaver KA, Mascola L, Wenger JD. Reduction in the incidence of human listeriosis in the United States. *JAMA* 1995;273:1118-22.