Case Report

Congenital brucellosis:
A case report

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Abstract
Although rare, brucellosis is endemic in the Kingdom of Saudi Arabia (KSA). In the case presented here, a neonate was born at 29 weeks gestation with severe respiratory depression, pyrexia; hypotension and an elevated white blood cell count. Her mother was a 19-year-old pregnant woman who developed premature rupture of the membranes and went into labour early. Sepsis was suspected and so the neonate received dobutamine and empiric ampicillin/gentamicin. The mother reported visiting a farm during her pregnancy and so congenital brucellosis was considered a possibility. Blood cultures were positive for Gram-negative coccobacilli and serology confirmed the presence of Brucella abortus and B. melitensis. Antibiotic treatment was changed to rifampin/gentamicin/ciprofloxacin but on day 17 the baby deteriorated and gentamicin was discontinued and meropenem was added. The neonate gradually improved; meropenem was discontinued on day 24 and the baby was discharged from hospital on day 38.

Keywords
congenital brucellosis, pregnancy, neonate, Brucella, Saudi Arabia

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Introduction

Brucellosis is a zoonotic disease prevalent in Central and South America, the Middle East, Africa, and Asia, and has a global incidence of more than 500,000 cases per annum. In some countries it has been described as an occupational hazard. In the Kingdom of Saudi Arabia (KSA), brucellosis is endemic and in 2011 the Ministry of Health reported an incidence of 18/100,000 population/year. Transmission to humans occurs primarily through direct contact with infected animals or consumption of infected animal products, such as, infected meat or unpasteurized milk. Human-to-human transmission is rare but cases of vertical transmission from mother to infant via breastmilk have been reported. Other ways of transmitting brucellosis may include, bone marrow transplantation, sexual intercourse and blood transfusion. Despite the endemic nature of the disease in KSA, cases of congenital brucellosis are extremely rare. This case report describes a preterm infant diagnosed with congenital brucellosis.

Case report

A 19-year-old asymptomatic gravida 4, para 3, Syrian woman experienced preterm premature rupture of the membranes (PPROM) at 27 weeks and six days of gestation and was admitted to hospital. At the time of admission, the mother’s white blood cell (WBC) count was within the normal range (10.2 x 10^9/l) but her C-reactive protein (CRP) levels were elevated (15.1 mg/l). She initially received ampicillin (1 g IV every 6 h) and erythromycin (250 mg IV every 6 h) for two days. Thereafter, she received: amoxicillin (500 mg orally every 8 h) for 5 days; erythromycin (500 mg orally every 8 h) for 5 days; dexamethasone (4 mg orally every 12 h) for 2 days. At 29 weeks gestation, she delivered a female infant by spontaneous vaginal delivery. Apgar scores at birth were 6 and 8, after 1 and 5 minutes, respectively. The baby had to be intubated because of severe respiratory depression and following one dose of surfactant (3 ml/kg) administered via her endotracheal tube she was transferred to a neonatal intensive care unit and mechanical ventilation was initiated.

During her first hour of life, the neonate’s temperature and heart rate were 36.9°C and 127 beats per min, respectively. Examination showed: weight, 1.085 g; head circumference, 26 cm; length 38 cm. The baby was hypotensive and so a dobutamine infusion was started (5 μg/kg/min, increased to 10 μg/kg/min after 12 h) and high-frequency ventilation was initiated to improve her oxygen saturation. Because early-onset of sepsis was suspected, blood specimens for cultures were obtained and the neonate was treated empirically with antibiotics as per the protocol of the unit (i.e., ampicillin [200 mg/kg/day IV divided into 2 doses] and gentamicin [2.5 mg/kg/day IV]). Blood tests showed a high WBC count (38.3 x 10^9/l) and neutrophils 48.8%.

On day 2, results from the initial blood culture were negative and an attempt was made to extubate the baby but it failed and the neonate was re-intubated. On day 6, Gram-negative coccobacilli were detected. On day 7, the Rose Bengal test (RBT) showed positive results for Brucella antibodies. The antibiotic treatment regimen was modified and ampicillin was stopped and rifampin started (5 mg/kg/day IV every 12 h for 6 weeks) and gentamicin continued for two more weeks. On day 8, results from the serum agglutination test (SAT) were positive for B. melitensis and B. abortus, with titres of 1:160. On day 12, the paediatric infectious disease team added ciprofloxacin (10 mg/kg/day IV over 30–60 min infusion) to the treatment regimen. On day 17, the baby deteriorated and the medical team decided to
discontinue gentamicin and add meropenem (20 mg/kg IV every 12 h). The general condition of the neonate gradually improved and with the assistance of a nasal cannula and total parenteral nutrition (TPN) she became clinically stable. On day 24, she was judged stable and the meropenem was withdrawn. She continued on ciprofloxacin (30 mg/kg/day orally in three divided doses) and rifampin (5 mg/kg/day orally every 12 h) for six weeks. After five weeks, the infant was judged to be clinically stable and so her nasal cannula was removed and she was given preterm milk formula. At the time of discharge from hospital (day 38), she was active, weighed 1.57 kg and had received routine childhood immunisations.

On discussing her medical history, the mother reported that she had experienced intermittent headaches, anorexia, malaise, profuse sweating and abdominal pain in the fifth month of gestation. In addition, she had developed a urinary tract infection (UTI) in the second trimester and had received antibiotics for seven days. Apart from these symptoms she reported that she had felt well during her pregnancy. She disclosed that she had made frequent visits to her family’s farm and had consumed unpasteurized sheep milk in her first trimester. Moreover, she reported that her grandfather had a history of brucellosis and had been receiving treatment for approximately one year.

Ethical approval was not required for this case report because no intervention or changes were made to the clinical course of events. However, written informed consent was obtained from the parents of the neonate.

**Discussion**

Brucellosis is caused by *Brucella*, a gram negative, non-encapsulated and non-motile coccobacillus. Predominant *Brucella* species include *B. melitensis*, *B. abortus*, *B. suis*, and *B. canis*, in which sheep, cattle, swine, and dogs are the reservoirs, respectively. *Brucella* species vary in their capability to cause human disease but *B. melitensis* is thought to be the most pathogenic and the most important species for human brucellosis. *B. abortus* is the second most common cause of brucellosis and is commonly associated with cases of subclinical disease. Unlike a previous report of congenital brucellosis in a neonate from the KSA which was caused by *B. abortus* alone, we detected both *B. abortus* and *B. melitensis*.

The baby had not been breast fed nor had received a blood transfusion and so these modes of transmission were unlikely. The serological findings and the mother’s history of frequent visits to a family farm suggested that intrauterine transmission of brucellosis had occurred. With the exception of minor symptoms and a UTI, the mother had felt well during her pregnancy. However, she experienced premature rupture of membranes and a preterm birth, both known adverse outcomes of untreated brucellosis in pregnancy. In areas where brucellosis is endemic, it is important to consider congenital brucellosis after the exclusion of other microbial infections in a severely ill neonate. Early diagnosis and prompt therapy will improve neonatal outcome.

The RBT, a commonly used serological screening test for *Brucella* antibodies, was used to confirm the presence of brucellosis in this infant. However, it has been suggested that the sensitivity of this test is better in patients without a previous history of brucellosis exposure compared with those who have had repeated exposure. To confirm the presence of brucellosis, additional tests such as SAT, enzyme-linked immunosorbent assay (ELISA) for IgA, IgG and IgM antibodies and Coombs tube agglutination test are often used. In this study, the diagnosis of brucellosis was confirmed using
SAT. Blood culture was also used and although the diagnosis of brucellosis by blood culture has been reported to be successful in only 40 to 70% of cases, it remains an important test in the acute period of the disease.4,16,17

The management of brucellosis is dependent on patient’s age.4 Two treatment regimens have been suggested for children: >8 years, oral doxycycline/rifampicin for 6–8 weeks; <8 years, oral trimethoprim/sulphamethoxazole/rifampicin for 6–8 weeks.4 In the present case report, prior to the identification of Brucella, the infant exhibited signs of possible sepsis and so was initially prescribed gentamicin/ampicillin. Following diagnosis of brucellosis, her treatment was changed to rifampin/gentamicin/ciprofloxacin for 6 weeks. Similar to another case of congenital brucellosis, meropenem was also administered to hasten the recovery of the distressed infant.18 However, once the child showed improvement, meropenem was discontinued to reduce its toxic effects on the neonate.

Although, there has been a reduction in the number of brucellosis cases reported in KSA over the past few years, in the absence of an effective vaccine, health care professionals should continue to exhibit vigilance towards patients living in endemic areas. Congenital brucellosis is associated with morbidity and mortality and so early diagnosis and effective treatment is key for a favourable outcome. The new-born child in this report showed symptoms of perinatal infection and possible sepsis. The child had a premature birth, showed signs of respiratory distress, had pyrexia; hypotension and an elevated WBC count. The mother lived in an endemic area and had been in close contact with infected animals. Therefore, obtaining a detailed patient history from the parents is crucial in the diagnosis and prompt treatment for a distressed child. In summary, while congenital brucellosis is a rare disease in KSA, it should be suspected in a neonate when other bacterial infections have been excluded especially if the mother’s history is consistent with Brucella exposure.

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