Neonatal Coccidioidomycosis: A Case Report

To the Editors:

A 27-week, 4-day-gestational age male infant born to a 26-year-old G4P3 mother via vaginal delivery in the setting of preterm labor was admitted to the neonatal intensive care unit (NICU) for prematurity and respiratory distress. On the 18th day of life, he was noted to have a superficial erythematous skin lesion at the base of his left clavicle, thought to be a consequence of abrasion from his continuous positive airway pressure (CPAP) collar. At that time, he had a temperature of 37.1°C, a heart rate of 74 beats per minute, blood pressure of 71/37 mm Hg, respiratory rate of 38 breaths per minute and oxygen saturation of 89.7% on respiratory support of CPAP of 5 cm H_2O. On examination, he was well appearing with a soft anterior fontanelle, regular heart rate and rhythm, no respiratory distress on CPAP at 21% FiO_2, a soft, nondistended, nontender abdomen, appropriate muscle tone and strength, and no other skin lesions or rashes. Wound culture was obtained, and he was empirically started on cefazolin 75 mg/kg/day divided q8 hours for presumed cellulitis. Over the next 48 hours, there was worsening erythema over the area, with new pustules developing surrounding the main lesion with a yellow-tinged crust. Antibiotic therapy was broadened to vancomycin 15 mg/kg q12 hours. A complete blood count revealed a hemoglobin of 9.5 g/dL, hematocrit of 28% and platelet count of 652 TH/mm^3, white blood cell count was 17.9 TH/mm^3, with 50% neutrophils, 1% bands, 24% lymphocytes, 21% monocytes and 4% eosinophils.

Mother had prenatal care with prenatal labs, including rubella immune, Hepatitis B immune, HIV, RPR and group B streptococcus negative. The skin lesion did not improve with vancomycin treatment. The initial wound culture and investigation for neonatal herpes simplex virus were negative. Repeat wound culture, pathology and serum serology revealed the diagnosis.

Wound cultures revealed mold speciating further as *Coccidioides immitis*. Pathology reports of the skin scrapings of the neck lesion also revealed the presence of spherical fungal organisms that were GMS- and PAS/D-positive, consistent with *coccidioides*. Serologic testing revealed the infant was positive for *coccidioides* IgG antibodies and negative for *coccidioides* IgM antibodies, with a reflex titer of 1:16. Further history from the mother revealed travel to Riverbank, California, an area endemic for coccidioidomycosis, during the 2nd trimester. Shortly after this trip, the mother developed fever, cough and runny nose, which resolved within 2 weeks without medical intervention. Serologic testing of the mother at the time of the infant's diagnosis was positive for *coccidioides* IgG and IgM antibodies (no documentation of titer). This made the diagnosis for the infant as neonatal coccidioidomycosis. Treatment was initiated with fluconazole (12 mg/kg/dose q24 h).

Coccidioidomycosis is an endemic fungal infection caused by the pathogenic dimorphic fungi, C*occidioides immitis* and C*occidioides posadasii*. Coccidioides species are found in deserts of the Southwestern United States and Central and South America.[1] The mycelial or mold grows in the soil of endemic areas; after inhalation, fungi convert to the parasitic phase in the host.[1] Current literature suggests that congenital coccidioidomycosis is very rare, limited to a few case reports.[2–4]

The infant's presentation at 2 weeks of life with no known exposure in the NICU, along with the mother's illness and subsequent positive serology, raises a high index of suspicion for vertical transmission of coccidioidomycosis in the neonate. The route of transmission is often debated in the literature, and there are case reports describing both vertical and transplacental transmission.[2,3,5–7] The large size of the spherule and granulomatous reaction has been hypothesized as potential explanations for rare transplacental transmission.[5] In nonvertically transmitted cases, the infant likely had a primary infection by inhalation of aerosolized spores into the lungs after birth.[6,8–10] The clinical presentation of infants with coccidioidomycosis has been variable, with clinical manifestations including fever, respiratory symptoms, decreased activity, decreased oral intake and meningitis. Cutaneous manifestation of neonatal coccidioidomycosis is extremely rare. There are 2 other cases of neonatal coccidioidomycosis reported with cutaneous manifestations, however, in both cases described, the infants also had systemic findings, including pneumonia.[7,11] Neonatal coccidioidomycosis, regardless of the mode of transmission, has a high mortality rate, often with evidence of disseminated disease and multiorgan involvement found on autopsy.[3,6,9,11]

There has been a paucity of literature on neonatal coccidioidomycosis despite the increasing incidence of coccidioidomycosis starting in the 1990s and peaking in 2011.[12] Due to the high morbidity and mortality associated with neonatal coccidioidomycosis, this case highlights the importance of early identification of vertically transmitted coccidioidomycosis in patients with isolated cutaneous manifestations.

At the time of discharge, the infant remained on fluconazole 12 mg/kg/dose q24 hours, with the cutaneous lesion demonstrating near resolution with continued follow-up in the infectious diseases clinic.

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Case report in accordance with institutional ethical standards and with the 1964 Helsinki Declaration and its amendments.
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