Neonatal Sepsis and Meningitis due to Staphylococcus Cohnii

Pages with reference to book, From 43 To 44

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Under normal circumstances, at deliveiy and during the inunediate neonatal period, the infant is exposed to many organisms[1].
Coagulase negative staphylococci (CS) are now recognized as the majorcauses ofnosocomial infections in neonates in many hospitals in different countries[2]. Staphylococcus (S.) cohnii is one of the coagulase negative and novobiocin-resistant staphylococci and is usually isolated from farm animals[3-5] 5. S. cohnii infection in humans is extremely rare[7,8].
A case of sepsis and memngitis in a neonate due to S. cohnii is reported here.

Case Report

This baby was born vaginally as the fourth child of a 38 year old mother with a birth-weight of 2260 g after a gestational period of 38 weeks. First minute Apgar score was 7. Umblical cord was wrapped around the neck and he had abundant ecchymosis on the face, forehead and neck. He was transferred to our neonatal intensive care unit (NICU) for hypoglycemia, he developed in the district hospital 19 hours after delivery. Both mother and grandmother had insulin-dependent diabetes. On physical examination, his condition was fair, however, he had fine tremors and poor sucking reflex. Moro and grasp reflexes were good and the rest of the examination was unremarkable except the II0 III°/'VI° grade systolic murmur in the precordial area.. Blood glucose level was less than 10 mg/dl on hospitalization. Initial bolus of 100 mg/kg of 10 percent dextrose in water solution (1 mI/kg) was given and followed by a continuous infusion of 6 mg/kg/minute of 10 percent dextrose in water. The blood glucose levels were monitored and stabilized after48 hours withoral formula and parenteral glucose supplement. Complete blood count, bloodpH and electrolytes andcalciurnwere normal. Onfourth day, the baby developed apnea, with a greyish discolouration of the skin and sciierema on the face. Sepsis was suspected and treatment with cefotaxim and anukacin was initiated after blood culture was obtained. Oxygen with hood and aminophyllin were given. Blood gases and pH and electrolytes were again within normal limits, cranial ultrasonography and chest x-ray were negative. Laboratory investigations showed hemoglobin 13.6 g/dl, hematocrit 43%, white blood cells 26 100/ui, c-reactive protein 24 mg/L, immature/total neutrophil ratio= 0.2. Blood glucose and calcium levels were 91 mg/dl and 9.5 mg/dl, respectively.
On the 10th day of antibiotic therapy the baby started having tonic-clonic seizures and developed spastic posture (opisthotonus). Lumbar puncture was carried out and cerebrospinal fluid (CSF) culture and blood culture were obtained.
Two days later, it was reported that S.. cohnii grew in cultures of CSF and blood which was resistant to all antibiotics except vancomycin. Vancomycin 15 mg/kg/dose, bid, was infused over 60 minutes via syringe pump. The microorganism that grew in blood culture was found to be identical to that in the CSF by microbiological analysis[9].
The patient had gradual recovery thereafter and vancomycin treatment was stopped after 10 days and he was discharged at 30 days of age. The patient now, 9 months old, can sit with support and displays interest with toys and other people, suggesting slight delay in motor development.

Discussion

Neonatal sepsis is a disease of infants who are less than 1 month of age, are clinically ill and have positive blood cultures. The primary site of invasion is most often the bloodstream, with spread to the meninges in 25 to 30 percent of cases. Systemic bacterial disease occurs in one to 10 cases per 1000 live births, depending on such factors as the rate of prematurity, predisposing maternal conditions and extent of life-support procedures required postnatally[10]. There has been a dramatic increase in CS bacteremia in NlCUs. The incidence of bacteremia inthis areaalone has been a majorreasonforthe increase in hospital-wide nosocomial CS bacteremia[11]. One longitudinal study conducted over 2.5 years found that 73 percent of all nosoconilal bacteremias in a NICU were caused by CS; 22 percent of all low- birth-weight (LBW) infants admitted to this unit became bacteremic with these organisms[12]. The importance of CS as nosocomial pathogens has prompted more interest in their detailed characterization through speciation, genetics and antimicrobial susceptibility[13].

CS are resident bacteria, indigenous to mammalian hosts and are natural inhabitants of human skin[14]. S. epidermidis is the most prevalent and persistent species on human glabrous skin and mucous membranes; S. cohnii is found only transiently on skin[13]. The original description of S. cohnii by Schleifer and Kloos[15] was based on a total of 42 strains isolated from humans, approximately 70% of which would be included in S. cohnii subsp. 1 and the remainder of which would be included in S. cohnii subsp. 2. Later, these authors described each of the S. cohnii subspecies and designatedtheir type strains; S. cohnii subsp. I was named S. cohnii subsp. cohnii and S. cohnii subsp. 2 was named S. cohnii subsp. urealyticum[16].

CS are the most common cause of nosocomial bacteremia, particularly in areas of the hospital where the use of indwelling vascular catheters is common[17]. However, these organisms are also the most common blood culture contaminants[18]. It is important, therefore, to obtain multiple blood cultures from separate venipuncture or access sites and to use rigorous criteria for defining true bacteremia[13,19-21].

Multiple antibiotic resistance is a common bacteriologic feature amonj clinical CS isolates from neonates[22,23], children and adults.

The isolates are generally resistant to all antibiotics except vancomycin.

Duration of prior antibiotic therapy is a risk factor for neonatal nosocomial sepsis in general[25]; this is most likely true with regard to CS infection as well.

Vancomycin hydrochloride is the drug of choice for treatment of S. cohnii and the other CS infections. It is a bactericidal antibiotic that interferes with cell wall synthesis. Its dosing and administration in neonates are related to the infant's weight and postnatal age[26,27].

In recent years emergence of CS as important neonatal pathogens affecting LBW newborns who are by definition immunocompromised is increasingly encountered. More remains to be learned about the interactions between these ordimarily non-pathogenic organisms and neonates as well as about optimal methods to treat and prevent these infections[2]. By successfully limiting the occurrence or duration of these infections in NICU patients, perhaps hospital stays can be shortened and some mortality among the patients can be avoided.

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