Case Report

Staphylococcal scalded skin syndrome in a very low birth weight preterm infant

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ABSTRACT

Staphylococcal scalded skin syndrome (SSSS) is an exfoliative dermatitis produced by the toxins of some strains of staphylococci, predominantly phage Group 2, strains 71 and 55. It has been reported mostly in children under 5 years of age with few cases only reported in very preterm infants. The disease can be life threatening in very low birth weight preterm babies. We are reporting one such case to emphasize the importance for clinicians to not only recognize the clinical manifestations of SSSS but also the need to closely monitor infants, especially VLBW infants with SSSS for bacterial sepsis and other complications.

Key words: *Staphylococcal scalded skin syndrome, Preterm very low birth weight, Exfoliate dermatitis*

Staphylococcal scalded skin syndrome (SSSS) is an exfoliative dermatitis produced by the toxins of some strains of staphylococci, predominantly phage Group 2, strains 71 and 55 [1,2]. Lack of protective antibodies to exfoliative toxins A and B (ETA and ETB) and immature renal function, which impairs the ability to excrete the toxin have been suggested as the reasons [3-5]. SSSS should be suspected in infants with generalized exfoliative lesion and positive Nikolsky sign [3]. Nikolsky's sign refers to the ability to induce peripheral extension of a blister as a consequence of applying lateral pressure to the border of an intact blister. The staphylococcal ETA or ETB splits the granular layer of the skin, induces proteolysis, and might exhibit superantigen activities such as epidermolysis and lymphocyte mitogenicity.

Clinically, SSSS starts with a bright erythema resembling a scald. The erythema usually begins on the face and gradually spread downward with the formation of blisters and bullae to involve the whole body with accentuation in the flexural areas. The bullae are flaccid and rupture easily, progress rapidly into large areas of denudation [4,5]. In extreme cases, the entire upper epidermis may shed. The level of cleavage is superficial, and hence, it heals without scarring. Histologic examination of the skin shows separation at the level of the granular layer with cell death and acantholysis without any inflammatory infiltrate.

Staphylococci are found in nasopharynx and less commonly on umbilicus, urinary tract, superficial abrasions, conjunctiva, and blood and spread hematogenously. The differential diagnosis of SSSS includes drug-induced toxic epidermal necrolysis, epidermolysis bullosa, bullous mastocytosis, herpetic lesions, and neonatal pemphigus [4,5]. It has been reported mostly in children >5 years of age with only few cases reported in very preterm infants. The disease can be life threatening in very low birth weight preterm babies. In these cases, the disease might cause significant complications and can be life threatening. We are reporting such a case.

CASE REPORT

We present a case of a baby, who is a late preterm, 35 weeks gestation, 1.045 kg, small for gestational age, first of twin (discordant), girl baby born by lower segment cesarean section (Indication twin pregnancy and intrauterine growth restriction) to a 27-year-old G2P1L1 mother. The second twin weighed 1.93 kg. After examination, the hemoglobin was found to be 10.3 g/dl in the first twin, whereas the same it was 15.4 g/dl in the second twin. Mother had hypothyroidism and was on thyroxine during pregnancy. After the birth of the baby, she cried immediately and no active resuscitation was required. The baby also had anemia, for which leukodepleted packed red blood cell transfusion was given. She was on routine low birth weight (LBW) baby care and breast milk feed.

On postnatal day 23, the baby developed watery nasal discharge and she was treated with saline nebulization and nasal drops. On postnatal day 25, she developed peeling of skin, initially in the perioral area, where the base of the lesion was erythematous. Subsequently, she developed peeling of skin over forearm, hand, abdomen, and buttocks (Fig. 1a and b). Her sepsis screen was negative and blood culture and sensitivity did not show any growth. However, the nasal and skin swab cultures showed heavy growth of coagulase positive *Staphylococcus aureus* sensitive to Linezolid and were treated with IV Linezolid for 10 days. Initially, the baby was very sick and required IV fluids along with other supportive measures but gradually improved with IV antibiotics and her skin lesions improved with topical applications of Vaseline. Further, course in the hospital was uneventful and the baby was discharged with

Figure 1: (a and b) Classical staphylococcal scalded skin syndrome appearance - perioral and on abdomen

subsequent follow-up, along with the other twin. There was no evidence of staphylococcal infection in both the parents and there nasal swab cultures were sterile. There was no recent outbreak of staphylococcal infection in the NICU.

DISCUSSION

Exfoliative skin diseases are relatively rare in newborn. When caused by coagulase-positive *S. aureus*, scalded skin diseases such as SSSS and bullous impetigo may develop [2]. Predominantly, it affects children <5 years of age and is very rare in LBW preterm infants. Characteristically, SSSS consists of diffuse erosions with epidermal separation in the submucosal layer through the granular layer. The typical features of SSSS are involvement of periorificial face, deepithelialization of friction zones, and absence of mucosal involvement. It mimics toxic epidermal necrolysis (Lyell's syndrome). However, in toxic epidermal necrolysis (Lyell's syndrome), there is a severe involvement of visible mucosa and also the respiratory, gastrointestinal, and urinary tract mucosa [4,5].

In infants and young children, potentially fatal complications include pneumonia, septic arthritis, hypothermia, dehydration, and secondary infections. With appropriate management, however, mortality due to SSSS in children remains <5%. Therefore, early diagnosis and appropriate treatment can prevent the mortality associated with these complications.

Diagnosis of SSSS is mainly based on clinical features. Tzanck preparation from a freshly denuded area may reveal many acantholytic cells without inflammatory cells. Culture specimen should be collected from the nose, throat, or pyogenic focus on the skin for isolation of staphylococci.

S. aureus infection is usually hospital acquired in premature infants and as with any other infection, prevention is a high priority. Outbreaks of SSSS have been reported in NICUs due to handling of the babies by infected or asymptomatic carriers of staphylococci. Personal barrier technique is the most effective ways to prevent transmission of infection. Proper hand washing, minimal handling, appropriate cleaning of equipment between uses, avoiding central catheterization, isolation of the infected infant, and placement of exposed neonates into a cohort are the methods to prevent spread of infection [5,6].

CONCLUSION

SSSS in VLBW preterm babies is very rare but fatal, and hence, an early prompt diagnosis and treatment with parenterally administered beta-lactamase-resistant penicillins, are important to prevent life-threatening complications of this syndrome.

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