Generalised staphylococcal pustulosis in a neonate: A case report

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CASE REPORT

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Abstract

Pustular eruptions in a neonate are mostly benign, but several are serious and have infectious aetiology. A detailed history, complete physical examination and careful assessment of the lesions are essential for diagnosis. The need to investigate every neonate with pustules for an infectious aetiology is emphasised. This case of generalised pustulosis in a neonate is reported as it is an uncommon presentation of Staphylococcus aureus infection, diagnostic difficulty caused by atypical skin lesions and similarity of clinical features with other causes of neonatal pustular diseases.

Key Words

Neonate, generalised pustulosis, *Staphylococcus aureus*

Implications for Practice:

1. Pustular disorders are common in the neonatal period. Most of these conditions are benign, but several serious and infectious diseases can present in the neonate as pustular disorders.
2. The similarity of clinical features and lack of relevant literature increases the diagnostic difficulty.
3. Any pustular rash in a neonate should be investigated since the treatment and prognosis of each cause is different.

Background

Pustular eruptions in a neonate are due to a variety of causes, the benign causes include erythema toxicum neonatorum, transient neonatal pustular melanosis, and neonatal acne. The most common causes of infectious pustular skin lesions include bacterial infections, which may be initially localised (*Staphylococcus aureus*) or septicaemic (*Listeria monocytogenes*); viral infections (herpes simplex*, varicella-zoster*)*;* fungal infections (Candidiasis, *Malassezia furfur*)*;* or parasitic disorders (scabies).[1,2] We report this case of generalised pustulosis in a neonate as it is an uncommon presentation of *Staphylococcus aureus* infection, diagnostic difficulty caused by atypical skin lesions and the similarity of clinical features in the initial course of the disease with other causes of neonatal pustular diseases. Pustular rash in a neonate should be investigated as the treatment, course and prognosis for these conditions are different.

Prior approval for the study was obtained from the Institutional Clinical Ethics Committee and the study was conducted in accordance with internationally approved guidelines. The study was explained to the prospective subject and informed written consent was taken from the subject.

Case details

An otherwise healthy, full-term nine-day-old female neonate presented with a history of pustular rash on her body from the last two days. The neonate was well-appearing, had good feeding showed no malaise, or irritability.

The infant was born at our primary health centre by a full-term normal vaginal delivery and had been breastfeeding since birth. She weighed 2600 grams. The mother gave no history of sexually transmitted infections, no genital lesions before delivery, and no complications during pregnancy. There is no history of drug consumption.

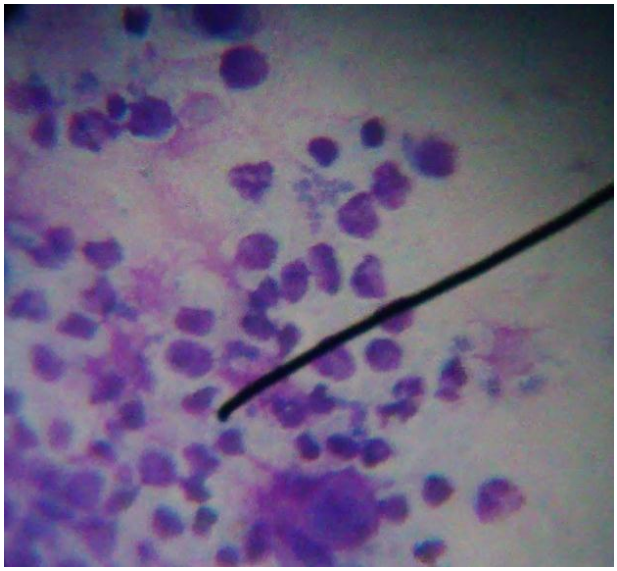
The physical examination showed a generalised papulopustular rash over scalp, trunk, neck and extremities sparing palms and soles with a few, fragile, non-tender bullous lesions measuring 1 to 2cm in diameter over back.

On examination the infant was afebrile, had no lymphadenopathy, scars or sinuses and the neonatal reflexes were normal, rest of the systemic examination was normal.

Figure 1: Neonate with generalised papulopustular rash over trunk few bullous lesions measuring 1 to 2cm in diameter over trunk

Results of complete blood count with differential leucocyte count were unremarkable. Gram stain of blister fluid shows gram-positive cocci in clusters and many puscells. Further analysis of blister fluid with 10 per cent potassium hydroxide preparation showed no fungal elements, Tzanck test was negative. Definitive diagnosis of *Staphylococcus aureus* infection was made by obtaining a culture from the blister fluid.

Figure 2: Gram stain of blister fluid shows gram-positive cocci in clusters with numerous puscells



Blood culture was not performed due to economic constraints. HIV serology and VDRL test (for syphilis) of mother was negative. The patient was started on oral suspension of co-amoxiclav at the dose of (45mg/kg/day of amoxicillin with 11.25mg/kg/day of clavulanate) along with supportive treatment.

The skin lesions decreased significantly after starting oral antibiotic therapy and drainage of blister fluid. There was no recurrence of the lesions on follow-up. The infant gained weight and was breast-feeding regularly.

Discussion

In this case, the generalised distribution of pustular rash was an uncommon presentation of a Staphylococcus aureus infection, which is usually concentrated in the periumbilical area, neck folds, and diaper area.[3] Gram stain, Tzanck test and 10 per cent potassium hydroxide preparation of blister fluid is the preferred diagnostic modality for the assessment. However due to high cost, blood culture, viral cultures were not performed. Once the diagnosis was confirmed, the blisters were drained and treated successfully with oral antibiotics.

Pustular disorders are common in the neonatal period. Most of these are benign; but several serious and infectious diseases can present in the neonate as pustular disorders.[4] Neonatal dermis is thinner, has lanugo hair and is less firmly attached than adult skin. Protective flora is absent and the microbiological load encountered changes continuously. The structural immaturity of neonatal skin often results in atypical and ambiguous skin symptoms and signs, thus the similarity of clinical features, immaturity of skin and lack of relevant literature increases the diagnostic difficulty in cases of neonatal pustular lesions.[5]

Of the benign transient neonatal skin lesions, erythema toxicum neonatorum is commonest of all.[6] Erythema toxicum neonatorum presents as erythematous macules, papules, and pustules on the face, trunk, and limbs, typically it resolves spontaneously in a week.[7]

Staphylococcus aureus, causes many skin lesions like pyoderma and exfoliative skin diseases such as bullous impetigo and staphylococcal scalded-skin syndrome (SSSS). This is an extensive exfoliative dermatitis that can occur in newborns and previously healthy children. This syndrome is caused by Staphylococcal exfoliative toxin A or B. The severity varies from being a localised skin lesion to a more extensive generalised condition, characterised by cutaneous erythema followed by profuse peeling of the epidermal layer of the skin. These diseases might cause significant complications and mortality, the duration of the disease and mortality rate can be reduced with prompt treatment.[8]

The goal of the diagnostic approach in neonatal pustular lesions is to first rule out the possibility of an infective aetiology, as left untreated, these infections can have serious complications and to spare a healthy neonate with a benign transient condition from unnecessary investigations and morbidity.[1,9] The Gram's stain to detect bacterial infections, the Tzanck smear for detection of a herpetic infection (Multinucleated giant cells) as well as noninfectious pustular eruptions (eosinophils, neutrophils) and a 10 per cent potassium hydroxide mount for fungal infections are the most important quick diagnostic tests performed on skin scraping of pustules, they are very easy, rapid, and sensitive tests.[1,5]

In full-term newborns, *Staphylococcus aureus* infection usually first appears as a skin and soft tissue infection, but may rapidly progress to osteomyelitis, pneumonia, and sepsis.[10] Direct infection of the skin results in staphylococcal pyoderma, manifests as vesicles, pustules, erythematous papules; folliculitis; bullous impetigo with large, flaccid bullae; honey-coloured crusted areas of nonbullous impetigo and cellulites.[3]

This case of Neonatal staphylococcal pustulosis due to its generalised distribution is an uncommon presentation and shows similarities with a case report by Sandhu K et al.[11] The main objective of this article is to emphasise a systematic approach in evaluation of pustular eruptions in the neonate; a detailed prenatal, perinatal and family history; complete physical examination; and careful assessment of the morphology and distribution of the lesions form the cornerstone for diagnosis.

The need to investigate every neonate with pustules for an infectious aetiology is emphasised as the tests are very easy, rapid, and sensitive. Treatment with appropriate antibiotic drug is warranted while under evaluation to reduce morbidity.

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PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

ETHICS COMMITTEE APPROVAL

Clinical ethics approval from Institutional Clinical Ethics Committee.

PATIENT CONSENT

The authors, Mogre D A, declare that:

1. They have obtained written, informed consent for the publication of the details relating to the patient in this report.
2. All possible steps have been taken to safeguard the identity of the patient.
3. This submission is compliant with the requirements of local research ethics committees.