Unexpected outcome (positive or negative) including adverse drug reactions

Is heel prick as safe as we think?

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Summary

Purulent lymphadenitis is rare in newborn and is associated with prematurity and invasive procedure. Neonatal staphylococcal infections due to skin interruption during intramuscular vitamin K administration and national metabolic screening programme (heel prick or Guthrie card test) have been already previously described. This is a report of a premature infant who developed an inguinal adenitis as a result of late complications from heel pricks. The diagnosis was made on clinical grounds and confirmed by ultrasound scans. *Staphylococcus aureus* was isolated. Bacteremia did not occur and the lymphadenitis had a complete resolution with antimicrobial therapy. The heel prick is a well-established procedure in neonatal practice, nevertheless it is not risk-free. The attention to signs of infections is important to avoid complications such as purulent lymphadenitis, abscess formation and septicemia. Best practice prevention and control in minimising the risk of infections are the most important intervention to prevent this complication.

BACKGROUND

In developed countries, purulent lymphadenitis is an uncommon condition during the neonatal period. Most of these are laterocervical, submandibular and facial cellulitis-adenitis, that are due to group B *Streptococcus* infections.^{1–3} Prematurity and invasive procedures are main risk factors.

This report describes the case of a preterm infant who developed inguinal lymphadenitis as a result of heel prick staphylococcal infection.

CASE PRESENTATION

An 1845 g female infant was born at 34 weeks of gestational age by caesarean section after pregnancy complicated by gestational hypertension and vaginal *Candida* infection.

The Apgar score was nine at both 1 and 5 min. The infant was admitted to the neonatal care unit for prematurity. The immediate neonatal period was uneventful except for pronounced jaundice, which was monitored with serial bilirubin determinations by heel pricks. The

neonate was discharged from the hospital at 11 days of age. She developed well until the age of 19 days when her mother noticed a mass in the right inguinal side. The infant was immediately referred to the hospital for further diagnosis and treatment.

On admission, physical examination showed an infant in good general conditions with temperature of 36.4°C. She presented an erythematous, non-mobile, warm and painful mass in the right inguinal area, revealing a localised lymphadenopathy. There were signs of local infections on the corresponding heel (figure 1). Further examination was unremarkable.

INVESTIGATIONS

Ultrasound examination showed an enlarged, inhomogeneous swelling of an inguinal lymph node and confirmed the diagnosis of right inguinal adenitis. When disinfection of the mass was performed, pus was readily expressed from the lesion.

Full blood counts, swab of pus, urine and blood cultures were performed. Hb 17.6 g/dl; Htc 48%; white cell count

Figure 1 Preterm infant with inguinal suppurative adenitis: extensive inguinal swelling and signs of local infections on the corresponding heel area (white arrows).

25.56×10⁹/l with 33% neutrophils and 47% bands. The C-reactive protein (CRP) was 1.78 mg/l. Blood cultures remained sterile, while the pus swab resulted positive for *Staphylococcus aureus*.

TREATMENT

Intravenous therapy with teicoplanin and amikacin was immediately started. After 8 days of therapy, the clinical signs of infection disappeared. CRP value was 0.09 mg/l 2 days later. Antibiotic therapy was discontinued and the infant was discharged in good health.

OUTCOME AND FOLLOW-UP

A clinical follow-up at 6 months of age found an infant in good clinical condition. The adenitis has not recurred.

DISCUSSION

Purulent lymphadenitis is a rare clinical problem in newborn infants. The diagnosis can be made on clinical grounds, but ultrasound remains the most useful, non-invasive tool for diagnosis since it can differentiate between lymphadenitis and abscess formation. Inguinal lymphadenitis is consequence of inflammation on leg or foot and an inflammatory focus should be sought.

In this case, the inflammatory focus was the puncture site on the heel. Purulent infection of heel prick site with subsequent lymphatic spread to corresponding inguinal area may explain the pathogenesis of these unusual infections, rather than primary bacteremia.

The heel prick is a well-established practice in neonatal care and it is considered an effective and simple procedure, but it is not without risks. There are only few, and overall out-of-date reports of isolated neonatal lymphadenitis as complication of heel prick procedures.^{4 5} Nevertheless, it is important to keep in mind the possibility of developing these complications. Neonatal cases of staphylococcal scaled skin syndrome, followed staphylococcal inoculation during heel prick, have already been reported.⁶

Skin disinfection and proper hand hygiene of medical staff are essential in preventing onward transmission of staphylococcal infections in the hospital setting.

Intramuscular vitamin K administration or heel prick testing should be performed with correct and aseptic technique for the potential staphylococcal inoculation during skin interruption. Proper technique using the filter paper which is not sterile is crucial, too: the Guthrie test filter paper should not touch the skin of the baby.

We highlight the need for vigilance and adherence to hand disinfection strategies in maternity hospitals especially during heel prick and other preventive procedures.

Learning points

- Inguinal lymphadenitis in the premature infant is a rare, but dangerous disease which can be consequence of heel pricks.
- The careful skin disinfection and the early diagnosis are important to prevent risk of infection and to avoid complications such as purulent lymphadenitis, abscess formation and/or septicemia.
- Skin disinfection and proper hand hygiene of medical staff are essential in preventing onward transmission of staphylococcal infections in the hospital setting.

Competing interests None.

Patient consent Obtained.

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