

## Necrotizing Fasciitis In A Preterm, HIV Infected Baby

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### ABSTRACT

Necrotizing fasciitis (NF) is a rapidly progressive life threatening bacterial infection of the soft tissues. It is commoner in the adult population where it is associated with systemic and local disease conditions such as diabetes mellitus, intravenous drug abuse, dental lesions, trauma and immunosuppression. It is rare in children, especially neonates.

The hallmark of the management of NF is prompt diagnosis. Effective modalities of management include resuscitation, early surgical wound debridement to control infection and use of intravenous antimicrobial agents.

We report a case of NF in a preterm HIV infected neonate.

Key words: Necrotizing fasciitis, Intravenous access site, Intravenous antibiotics

Necrotizing fasciitis presents with signs of systemic toxicity and has a high rate of mortality and morbidity. The common pathogens usually associated with NF are *Streptococcus pyogenes* and *Staphylococcus aureus*. Some authors have also documented associations with *Pseudomonas aeruginosa*, Group B *Streptococcus*, *Streptococcus viridans* and *Clostridium* species. Mixed bacterial flora have also been identified in some cases.

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### INTRODUCTION

**N**ecrotizing fasciitis (NF) is a rapidly progressive life threatening bacterial infection of the soft tissues. It is commoner in the adult population where it is associated with systemic and local disease conditions such as diabetes mellitus, intravenous drug abuse, dental lesions, trauma and immunosuppression. It is rare in children, especially neonates.

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## CASE REPORT

K.A was delivered at a General hospital at 32weeks gestation to an unbooked 46year old HIV infected mother who was not on Highly Active Anti-Retroviral Therapy (HAART). He was the second of a set of twins (the first twin died a few hours after birth), delivered via emergency Caesarean Section due to maternal pre-eclampsia and prolonged rupture of membranes (five days). His birth weight was 1.5kg. An initial diagnosis of preterm Low Birth Weight (LBW) with high risk for sepsis in a retroviral exposed baby was made. He was admitted into the neonatal unit and had venous cannulation on the dorsum of his right hand for intravenous fluids and antibiotics (Cefotaxime and Gentamicin). He was not fed with breast milk and was to receive oral Nevirapine daily for six weeks.

On the second day, a swelling was observed on the right hand, extending to the upper arm. It was tense, tender and erythematous. The intravenous access was immediately re-sited and the affected limb was raised and kept warm. The baby continued to receive intravenous fluids and drugs. Blood samples were taken for full blood count, serum electrolytes and blood glucose.

By the third day, the affected arm had developed a blackish discoloration, with bullae formation. The baby was irritable and febrile, with a temperature reading of 38.8°C. He was also tachypnoeic with a respiratory rate of 78 breaths per minute. The full blood count result showed a packed cell volume of 42%, a total white cell count of  $18 \times 10^9/l$  with toxic degranulations, and

a normal platelet count. The serum electrolytes were within normal limits. Samples were taken for blood and urine cultures. By the fifth day, the bullae had ruptured and the site had become ulcerated. At this time, the diagnosis was revised to necrotizing fasciitis with neonatal sepsis. A wound swab was taken for microscopy, culture and sensitivity pattern of antibiotics. The intravenous antibiotics were changed to Ceftriaxone, Vancomycin and Metronidazole in view of the common pathogens implicated in NF. K.A was to be referred to a tertiary hospital where he would have access to comprehensive care but that was not immediately possible as a result of lack of bed space at the tertiary hospital. A wound debridement could also not be done immediately, necessitating daily wound dressing with honey. The fever subsided 24 hours after antibiotics were changed. The necrotic tissue sloughed off in 48 hours and the wound began to granulate. The blood culture yielded *Staphylococcus aureus* which was sensitive to Ceftriaxone amongst other antibiotics. The wound swab yielded a mixed growth of *Staphylococcus aureus* and *Pseudomonas aeruginosa* both of which were sensitive to Ceftriaxone and Ofloxacin. The antibiotic combination was left unchanged in view of the antibiotic sensitivity pattern and clinical improvement. The baby's condition continued to improve daily with appreciable weight gain and healthy granulation tissue at the wound site. The baby was assessed by the burns and plastic unit and scheduled to have skin graft which the parents could not afford.

He was discharged four weeks later with a weight of 1.8 kg, the wound having healed with contractures at the elbow joint. DNA-PCR on dried blood sample at six weeks was positive and

the baby was referred to the tertiary hospital for further management of the retroviral disease and the release of the contractures.



Fig 1. Wound site few days after honey dressing was commenced



Fig 2. At 3months of life with scar and contracture at the elbow

## DISCUSSION

NF is a severe life-threatening, rapidly progressive condition involving the skin, subcutaneous tissues, fascia and muscle with substantial morbidity and mortality.<sup>1,2</sup> It is often associated with severe systemic illness such as fever, tachypnea, leukocytosis and leucopenia. Thrombocytopenia is said to occur in half of all cases<sup>3</sup> but was not observed in this case.

NF is commoner in adults than in children and is reported to be rare in neonates.<sup>3</sup> Legbo and Shehu,<sup>4</sup> in Northern Nigeria however reported that NF may not be uncommon in neonates in that part of the country.<sup>4</sup> NF can be classified as primary, when there is no identifiable causative factor in a healthy child<sup>5</sup> or secondary with the identification of causative factors like omphalitis, mastitis, impetigo and immunosuppression.<sup>6</sup> The initial lesion may vary from a rash, erythema, oedema, hardening, bluish to black discolouration, formation of blisters and necrosis.<sup>2</sup> The initial lesion was observed on the dorsum of the right hand of this patient at the intravenous access site for administration of fluids and drugs. Contamination during intravenous cannulation, prematurity and the baby's retroviral status may have contributed to development of the disease and its rapid course. Ibekwe et al<sup>7</sup> in Eastern Nigeria had earlier documented NF in a preterm, HIV exposed baby.<sup>7</sup>

The most frequent causative organism reported is *Staphylococcus aureus*<sup>2,3</sup> as seen in the index case. The wound culture also yielded *Pseudomonas aeruginosa* in conformity with previous authors who have documented

polymicrobial cultures.<sup>3,4</sup>

Prompt diagnosis, early surgical intervention and appropriate antibiotic use, are important in the management of NF<sup>3,5,6</sup> as seen in this case. The patient did not have the benefit of wound debridement because of the limitations of a resource-scarce environment. Honey was used to dress the wound daily because of its wound healing properties<sup>8</sup> and other aspects of management were delivered promptly to the baby to ensure survival. A high index of suspicion, resuscitation, wound dressing and aggressive antibiotic therapy are very important in the management of NF in a resource scarce setting like ours. The institution of skin graft which our patient could not afford is likely to limit scar tissue formation and improve the cosmetic appearance of the healed wound. Physiotherapy, another intervention which our patient did not have may mitigate development of contractures.

## CONCLUSION

This case highlights the importance of maintaining strict asepsis during venous or arterial cannulation in the newborn. Tissue around the intravenous access site should be observed meticulously and the site changed once there are changes such as erythema and swelling. More emphasis should be placed on prompt diagnosis, resuscitation, honey dressing and antibiotic therapy in the management of NF especially in resource scarce settings such as ours.

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