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Severe Skin Infection with *Staphylococcus aureus* in a 10-month-old Infant: About a Case at Sikasso Hospital

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Abstract **Case Report**

The growing emergency of infections with community-acquired methicillin-resistant Staphylococcus aureus (CA-MRSA) secreting the Panton-Valentine toxin (PVL) has become a serious health problem with epidemic proportions. These bacteria are responsible of severe skin and soft tissue infections, with frequently necrotic lesions, and severe necrotizing pneumonias. Besides adequate antibiotic treatment, surgical drainage and incision of the skin lesions are important. It is therefore essential to respect elementary hygiene rules in order to prevent the acquisition and transmission of CA-MRSA.

Keywords: Panton-Valentine toxin (PVL), severe skin and soft tissue infections, CA-MRSA.

INTRODUCTION

Superficial bacterial skin infections are a problem frequently encountered in medical practice [1]. There are two types depending on the level of skin involvement, superficial skin infections and deep skin infections that can extend to a deeper level [1].

These infections are usually mild with the exception of necrotizing fasciitis [1, 2]. However, their potential seriousness should not be trivialized given the virulence of certain bacteria and the development of resistance to common antibiotics [3].This is a therapeutic emergency too little known to the pediatric community [2].Indeed, the increasingly important emergence of severe skin infections caused by Methicillin-Resistant Staphylococcus Aureus (MRSA) community-based and / or carriers of the Panton-Valentine toxin (PVL), poses a management challenge [3, 4].We report a case of severe skin infection with staphylococcus aureus in a 10 month old infant.

OBSERVATION

A 10-month-old infant, the third of female siblings with no known pathological history, with right unilateral purulent otorrhea and inflammatory nodular lesions. The clinical examination revealed a febrile state, suppurative and crusty ulcerative necrotic lesions of the pinna of the right ear, the posterior aspect of the right forearm, the right knee and the left buttock (Figure 1). The biological assessment including a bacteriological smear shows a methicillin-resistant Staphylococcus aureus (MRSA), a positive CRP at 98 mg / dl, a blood glucose level at 93 mg / dl, a normal CBC, a negative HIV serology and sterile blood cultures. The clinical appearance and the additional examinations made it possible to make the diagnosis of anthrax to MRSA.

The patient was treated with 500 mg pristinamycin (20 mg / kg / day in two doses) for ten days and surgical excision of the necrosis with a daily dressing (Figures 2) after failure of the initial treatment

with vancomycin (40 mg / kg every 8 hours) which was followed by the appearance of new nodules. The clinical course was marked by healing of the lesions with loss of the pinna (Figures 3).

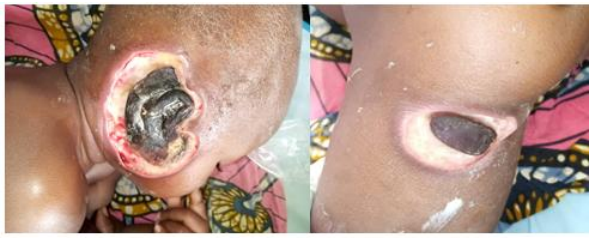

Fig-1: Ulcerative necrotic lesions

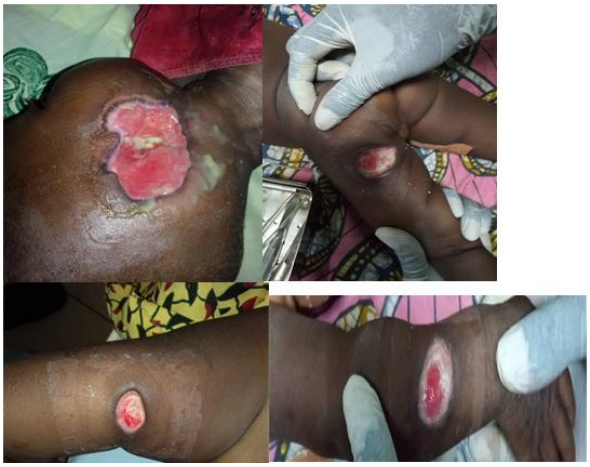

Fig-2: wounds after removal of necrosis

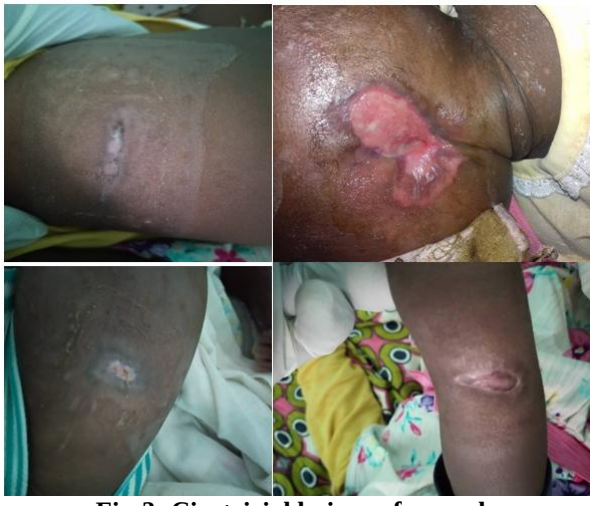

Fig-3: Cicatricial lesions of wounds

DISCUSSION

Severe skin infections caused by community-based Methicillin-Resistant Staphylococcus Aureus (MRSA) and / or Panton-Valentine toxin (PVL) carriers represent a global public health issue [2]. A study carried out at admissions to Geneva University Hospitals between January and August 2003 showed a prevalence of 9/10 000 for community MRSA carriage [5, 6, 7]. In the literature, mortality from SA-PVL necrotizing pneumonia ranges from 42.9 to 56%, and MRSA contamination has long been considered a problem almost exclusively in the hospital setting. In recent years, the emergence and identification within the community of particularly virulent strains of MRSA has become a major public health problem [2, 5]. Methicillin resistance is caused by the production of an altered "penicillin binding protein" (PBP2a), encoded by the mecA gene, present on a mobile genetic element called the Staphylococcal cassette chromosome (SCC). So far, five types of SCC have been identified, each conferring a particular profile of susceptibility to antibiotics [3].

Community MRSA strains differ from nosocomial ones by two characteristics, namely the presence of type IV SCCmec (Staphylococcal cassette chromosome), a gene which gives it resistance to beta-lactams, but frequent sensitivity to gentamicin, quinolones and macrolides (NB: CA-MRSA USA 300 strains are often resistant to macrolides) [3, 5, 6] and the presence of a gene encoding the Panton-Valentine toxin [3]. This powerful leukotoxin acts by forming pores on the cell membrane of neutrophils, monocytes and macrophages, but also by the calcium-dependent activation of polymorphonuclear neutrophils, with release of enzymes and formation of superoxide ions. The gene encoding this toxin can also be found in MSSA strains, but mainly in community MRSA strains. S. aureus PVL positive strains have marked skin tropism and can cause severe skin infections. Severe necrotizing pneumonia has been described in children and adults in usual good health. Arthritis, mediastinitis, osteomyelitis and septic thrombophlebitis are also possible [2, 3]. The risk factors for community MRSA carriage are poorly understood [3, 5, 6]. Cases of transmission of MRSA by domestic animals (dogs, cats, horses, birds, etc.) can thus serve as “reservoirs” have also been reported [8, 9,10].

The treatment of these skin infections depends on the type of skin lesions: for example, when the superficial skin infection is commonplace, such as folliculitis or boils.

Treatment is based above all on the avoidance and optimal management of local contributing factors (friction, maceration, shaving, treatment with topical corticosteroids, application of topical irritants) or general (obesity, malnutrition, congenital or acquired immune deficiency, renal failure) [11].

Superficial folliculitis is treated by applying antiseptic products twice a day (chlorhexidine, iodine derivatives, sodium hypochlorite) [11, 12]. Several topical antibiotics show good antistaphylococcal activity, in particular fusidic acid, mupirocin, erythromycin, clindamycin and neomycin. However, their use remains criticized because of the risk of selection of resistant germs as well as potential sensitization [11-13]. In case of deeper involvement, the

addition of systemic antibiotic therapy should be discussed.

In the event of a boil or anthrax, the application of moist, warm compresses or ammonium sulfobituminate promotes spontaneous drainage of the infection. The incision with drainage is important and indicated in cases of purulent collection without spontaneous drainage. As with folliculitis, the use of topical antibiotic therapy remains controversial [11, 12]. Oral antibiotic therapy is indicated in multiple boils that are disseminated or occur in a field of immunosuppression, in mid-facial localization, in anthrax or in systemic symptoms such as febrile state [11].

This during superficial skin infections with MRSA, our observation confirms that well-conducted antibiotic therapy may be insufficient, probably related to poor tissue penetration following tissue damage and necrosis associated with the toxin. For the choice of antibiotics, the antibiogram is essential.Recourse to excision of the edges followed by directed healing of the lesions is sometimes necessary. In general, any patient presenting with skin lesions suggestive of a staphylococcal infection should have a bacteriological sample before starting any antibiotic treatment.

CONCLUSION

The emergence of the community-based MRSA strain carrying the Panton-Valentin toxin requires increased vigilance in the daily practice of the doctor, in particular with regard to patients with staphylococcal skin lesions. Preventing the transmission of bacteria is essential and relies on observing basic hygiene rules.

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