Community acquired methicillin resistant *Staphylococcus aureus* soft tissue infection complicated by septicaemia, necrotizing pneumonia, deep vein thrombosis and pyomyositis

***G Liyanage[1], S G S Adhikaram[2], S E H L Chandrasiri[3], M Aqiff[4]**

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Introduction

Staphylococcus aureus is a pathogen responsible for various infections, both in health care institutions and in the community[1]. Moreover, antibiotic resistance to this organism is a major problem worldwide[2,3,4]. Community Acquired Methicillin Resistant Staphylococcus Aureus (CA-MRSA) has emerged in paediatric practice since mid-1990s[5]. Transmission is most frequently through direct skin-to-skin contact or contact with shared items or surfaces. Unlike Hospital Acquired Methicillin Resistant Staphylococcus Aureus (HA-MRSA), CA-MRSA often strikes young, previously healthy children[6]. We report an 11 year old child with Skin and Soft Tissue Infection (SSTI) and life threatening invasive disease with deep vein thrombosis (DVT), necrotizing pneumonia, pyomyositis and septicaemia.

Case report

An 11 year old previously healthy boy was admitted with swelling of right thigh for 5 days, intermittent fever and cough for 48 hours duration. He had two episodes of haemoptysis on the day of admission. On examination, in addition to marked cellulitis of the right thigh he had a generalized pustular rash. Respiratory tract assessment revealed tachypnoea, bilateral diffuse crackles and reduction in air entry on mid and lower zones of the left lung. With a presumptive diagnosis of right thigh cellulitis complicated by pneumonia, we commenced him on intravenous cefuroxime and cloxacillin. Chest x-ray showed bilateral patchy opacities. Since the swelling of the right thigh was rapidly increasing (Figure 1), ultrasound scan was performed to exclude a collection of pus. It showed a non-compressible right common vein and a thrombus in the common femoral vein at the level of sapheno-femoral junction extending into superficial veins with extensive soft tissue inflammation.

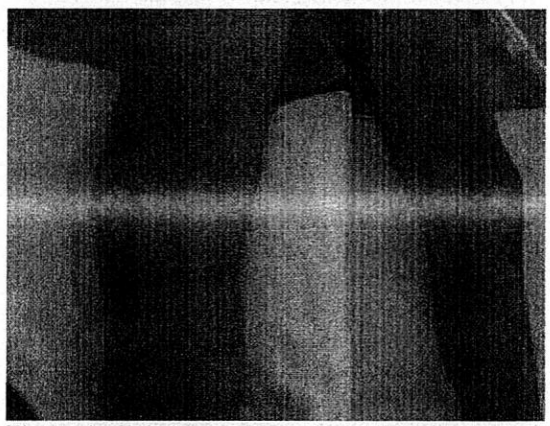

Figure 1: ***Soft tissue infection of thigh extending in to the leg***

Since his clinical condition deteriorated, he was transferred to high dependency care. Intravenous vancomycin was commenced. His C-reactive protein (728mg/dl) was high. Complete blood counts revealed neutrophil leucocytosis. His renal and liver functions remained normal. A CT scan of the chest confirmed multiple focal consolidations in both lung fields (figure 2)

[1]*Senior Lecturer, Department of Paediatrics, Faculty of Medical Sciences, University of Sri Jayewardenepura and Honorary Consultant Paediatrician, Colombo South Teaching Hospital,* [2]*Senior Registrar,* [3]*Registrar,* [4]*Medical Officer, Professorial Paediatric Unit, Colombo South Teaching Hospital*
**Correspondence:* guwanil@yahoo.co.uk
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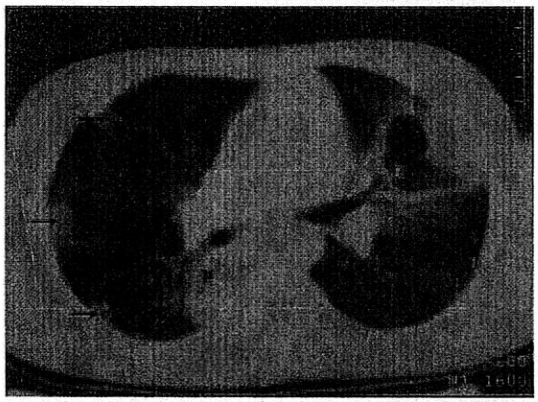

Figure 2: ***Multiple focal consolidations in CT scan of chest***

Blood culture and swabs from the pustules grew CA-MRSA sensitive to clindamycin, cotrimoxazole, erythromycin & vancomycin and antibiotics were changed accordingly. A week later, the CT scan of chest was repeated since cough and fever continued despite treatment. It revealed a flocculated right sided empyema and multiple small abscesses in both lung fields. In addition there were multiple abscesses in muscles of the chest wall. During his prolonged course of illness he developed multiple abscesses in both forearms muscles and posterior compartment of right thigh requiring repeated incisions and drainage. His creatine phosphokinase (5539 IU/L) was high and urine for myoglobin was positive indicating myositis. Subsequently, after a long hospital stay for nearly 2 months, with multiple interventions and varying antibiotics combinations, he recovered completely and was discharged home.

Discussion

In CA-MRSA infection, clinical spectrum ranges from asymptomatic colonization to SSTI and life-threatening invasive disease[6,7]. Ansorp study which had been conducted in the adult population in eight Asian countries, including Sri Lanka, has reported the high prevalence of hospital and community acquired MRSA strains[2]. A case report of infant with CA-MRSA infection with abscess formation and septicaemia[8] and a few other case reports in adults[9] with invasive disease have been reported in Sri Lanka. Many of the CA-MRSA strains have acquired the Panton Valentine Leukocidin (PVL) gene that produces a series of chemicals contributing to the invasiveness. PVL is a pore-forming toxin that creates an octameric pore in the affected membranes of human polymorphonuclear neutrophils (PMNs), macrophages and monocytes[10].

The incidence of severe pneumonias in children is increasing with a concurrent increase in the incidence of community-associated methicillin-resistant Staphylococcus aureus (CA-MRSA) infections[7]. Pneumonias caused by CA-MRSA have a rather distinct presentation[6]. Risk factors for CA-MRSA include ethnicity, day-care attendance and contact history of SSTI[11,12]. Most importantly, frequent, inadvertent use of antibiotics and self-medication with over-the-counter antimicrobial agents creates an environment that is suitable for rapid spread of numerous multidrug-resistant strains. It is indeed a major risk factor for increasing incidence, in Asian countries compared to other developed countries[4].

Although both CA-MRSA and HA-MRSA are resistant to traditional anti-staphylococcal beta-lactam antibiotics, such as cloxacillin or cephalexin, CA- MRSA when compared to HA-MRSA typically retains susceptibility to non-beta lactam antibiotics such as cotrimoxazole, tetracycline and clindamycin[13]. Although clindamycin is an effective therapy for CA-MRSA, there is a risk for development of clindamycin resistance during treatment[13,14]. Linezolid is a newer drug that is effective against CA-MRSA. It is well suited for the therapy of MRSA respiratory infection because of its excellent penetration into the lung[13]. However, cases of community-onset multi-resistant MRSA have been described[13]. Therefore, decisions regarding antimicrobial combinations should be individualized and local antimicrobial susceptibility patterns should be considered. Recent studies have shown a lack of correlation between nasal colonization and infections[15,16]. A Cochrane Review did not find sufficient data to support the eradication of MRSA colonization with topical or systemic antimicrobials[17]. Good hygiene measures and avoidance of sharing of items (i.e. towels, bed sheets) that could be possibly contaminated, is advocated as first-line prevention.

Our patient presented with life-threatening complications of CA-MRSA infection. High virulence of CA-MRSA would have been the reason for the severity of the disease presentation. High degree of suspicion and timely, aggressive antibiotic treatment targeting MRSA saved his life without any long term sequel. This case highlights the importance of a high index of suspicion for early diagnosis of CA-MRSA, especially in otherwise normal, immune-competent children. Clinicians need to be aware that beyond the commonly encountered skin and soft tissue infections, CA-MRSA can lead to invasive

life-threatening disease and the need for prompt treatment.

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