Comparative Severity of Pediatric Osteomyelitis Attributable to Methicillin-Resistant Versus Methicillin-Sensitive Staphylococcus aureus

Reference:

Scientific Literature Review

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Podiatric Relevance:
*Staphylococcus aureus* is the most common causative organism of osteomyelitis and thus it is necessary to understand the differences between methicillin sensitive and resistant strains when treating patients both surgically and medically. It is especially important in the pediatric population due to a frequency ranging from 67-89% of all osteomyelitic and musculoskeletal infections. Within the podiatric community osteomyelitis is a common finding in the diabetic and vasculopathic patients. If there are significant pathogenic differences between MRSA and MSSA osteomyelitic infections, the urgency of surgical management of MRSA infections may be altered.

Methods:
This study reviewed records of 97 pediatric patients with hematogenous osteomyelitis in order to examine whether any significant differences in disease severity existed among the test groups consisting of MRSA, MSSA, other organisms and no organisms cultured. The measures evaluated were as follows: degree and duration of elevated temperature, C-reactive protein, erythrocyte sedimentation rate, length of hospitalization, number of surgical procedures and long-term sequelae.

Results:
MRSA osteomyelitis as compared to other bacterial organisms displayed a significant increase in degree and duration of elevated temperature (p= 0.0001 for both), acute-phase reactant measures (white blood cell count, p= 0.0001; C-reactive protein, p=0.0058; erythrocyte sedimentation rate, p= 0.0046), initial length of hospital stay (p= 0.0001), and surgical interventions (all procedures, p= 0.0001; therapeutic procedures, p= 0.0002).

In a 2-way comparison between MRSA and MSSA osteomyelitis, there were no significant differences in median white blood cells (p=0.09), median erythrocyte sedimentation rate (p=0.16), or median C-reactive protein (p=0.21), but were significant for duration of admission (p=0.0001), maximum temperature (p=0.02), mean temperature (p=0.007), median no. procedures (p=0.09), and mean duration of antibiotics(p=0.05).

Conclusions:
This study aimed to observe whether there were measurable differences between MSSA and MRSA infections as far as pathogenesis. The authors concluded that MRSA produces more severe bone infection than MSSA, and is likely to require more aggressive surgical and medical management. It is important to note that although the authors found objective differences between MRSA and MSSA osteomyelitis, there were no significant hematologic differences. This study does not examine any variation in virulence of the organisms, but future research is warranted to help identify potential proteins to target for antibiotic therapy. Podiatrists can extrapolate from the findings of this study that WBC, CRP, ESR cannot be utilized in differentiating MRSA from MSSA and therefore a biopsy and culture is still required for definitive identification and sensitivity.