The aforementioned concerns are important enough to justify the need for larger scale prospective studies with a longer follow-up that examine the benefits as well as the potential adverse effects of corticosteroids administered to pediatric patients with SA.

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QUESTION 6: What is the optimal management of septic arthritis/osteomyelitis (SA/OM) caused by methicillin-resistant *Staphylococcus aureus* (MRSA)?

RECOMMENDATION: Patients with MRSA infection should be started on an antibiotic regimen, such as vancomycin, intravenously followed by linezolid, which is effective against this organism. Early consideration for surgical treatment and close monitoring is essential in pediatric patients with musculoskeletal MRSA infection to reduce the high prevalence of complications and late sequelae that are often seen.

LEVEL OF EVIDENCE: Moderate

DELEGATE VOTE: Agree: 85%, Disagree: 11%, Abstain: 4% (Super Majority, Strong Consensus)

RATIONALE:

In past decade, the prevalence of MRSA in SA and acute OM has dramatically risen between 3- to 10-fold [1–3]. Compared to methicillin-susceptible *Staphylococcus aureus* (MSSA) infections, patients with MRSA have more extensive areas of soft tissue destruction, more rapid spread of infection and experience higher mortality rates [2–4]. The course of treatment of these patients is also protracted with a longer length of hospital stay, need for surgical intervention and an increased risk of complications, such as persistent bacteremia, deep vein thrombosis, pulmonary embolus, pathologic fractures and other long-term sequelae [1,2,5–10].

The severity of MRSA infections may be related to virulence factors, such as Panton-Valentine Leukocidin (PVL) found in many MRSA strains [11,12]. MRSA strains may also contain specific virulence factors that are linked to increased soft tissue destruction, such as α-hemolysin and α-type phenol-soluble modulin [3].

Pediatric patients with MRSA infections are more systematically unwell with higher temperatures and increased tachycardia. In addition, they present with even higher leukocytosis (or absolute neutrophil count), greater elevations in erythrocyte sedimentation rate and C-reactive protein but lower hematocrit values [5,7,10,13].

Commencing appropriate empiric antibiotics in these patients is paramount to improve outcomes. Children with suspected MRSA SA or OM should be started on intravenous vancomycin or clindamycin. Daptomycin or Linezolid are alternatives for the treatment of MRSA infections in children. The duration of therapy should be individualized based on the response to treatment. A minimum course of three to four weeks for SA and four to six weeks of antibiotics for OM is recommended [4,14].

Cultures should ideally be obtained before initiating antibiotics in patients with musculoskeletal infection, especially if MRSA is suspected. Aspiration of the affected joint and obtaining blood cultures helps isolate the infective organism and should be part of the initial work up of these patients [14,15]. New diagnostic methods, such as real time polymerase chain reaction (PCR), may be useful in the rapid identification of MRSA or other infective organisms [5].

Appropriate imaging, such as magnetic resonance imaging (MRI), should also be part of the work up since this allows for localization of the infection and determination of the extent of disease. MRI may also help with surgical planning to ensure a more thorough debridement and decompression of infected areas [10,15,16].

Images may also reveal subperiosteal abscess formation or the presence of SA in the hip. The presence of such findings lead to the need for early surgical intervention since antibiotics cannot typically penetrate large abscess cavities. Compared to MSSA infections, MRSA infections are more invasive and have a higher rates of abscess formation. Thus, they require surgical intervention more frequently and a higher number of repeat procedures [5].

Aggressive surgical management during the initial procedure, involving opening a surgical window and intramedullary irrigation, is necessary to prevent the need for subsequent reoperation. Close monitoring of patients is critical to prevent complications and reduces long-term sequelae. Patients who fail to respond to antibiotics should undergo prompt surgical interventions. Repeat imaging should also be considered in patients who are not responding to treatment in order to determine persistent infection and assess the extent of bony and soft tissue involvement [6,10,11,14,16].

In summary, MRSA infections of the musculoskeletal system in children may have serious complications. They require early administration of antibiotics and may necessitate multiple surgical interventions. These patients often have a protracted hospital course and require vigilant monitoring to minimize the risk of complications.

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QUESTION 7: What is the best management for mycobacterium tuberculosis (TB) of the musculoskeletal system in children?

RECOMMENDATION: Mycobacterium TB periprosthetic joint infection (PJI) must be treated in collaboration with an infectious disease specialist, noting that the duration of treatment (minimum six months and up to two years) and the type of antimicrobials (usually a combination of four drugs) is determined based on the resistance profile of the pathogen.

LEVEL OF EVIDENCE: Moderate

DELEGATE VOTE: Agree: 86%, Disagree: 2%, Abstain: 12% (Super Majority, Strong Consensus)

RATIONALE

There is an agreement that anti-TB medications can eradicate most of the bacilli and prevent both relapse and drug resistance. The current recommendation for treatment length of extra-pulmonary TB in children is six months. However, these recommendations do not apply to osteoarticular infections and meningitis. Almost all available guidelines strongly recommend 12 months of anti-TB treatment for osteoarticular TB [1–5].

The recommended regimen for children with suspected or confirmed osteoarticular TB is a four-drug regimen consisting of Isoniazid (INH), Rifampin (RIF), Pyrazinamide (PZA) and Ethambutol (EMB) for 2 months, followed by a two-drug regimen of Isoniazid and Rifampin (HR) for 10 months [6].

There is limited literature that describes how to treat children with drug-resistant TB. For mono-drug resistance to either Isoniazid or Rifampicin, the recommendation is for 6-9 months of a three-drug regimen consisting of the other susceptible antibiotics from