RATIONALE

Early diagnosis of septic arthritis (SA) in the pediatric age group is essential in order to avoid adverse sequelae associated with delayed SA, such as osteonecrosis, chondrolysis, relapse or recurrent SA and sepsis, and is more important than the type of drainage[1–3].

For decades, the prevailing treatment of pediatric SA after early diagnosis was open arthrotomy, irrigation and debridement [2,4,5]. The optimal technique for drainage is controversial between needle aspiration, arthrotomy or arthroscopy. Arthroscopic drainage in adults with knee SA is the accepted treatment of choice, as functional outcome and success of treatment is better using this method of treatment [6,7]. Arthroscopic treatment of SA in pediatric patients is defined as a successful option for septic arthritis of the hip, knee, ankle and shoulder in children [8,9].

Despite concern about traction in septic hips during the infection process, several studies have demonstrated its safety [10–13].

Kim et al. and Chung et al. reported good results of hip arthroscopy utilization in SA [11,14,15]. In a prospective comparative study on hip SA, children treated arthroscopically had better functional outcomes (90% excellent vs. 70% in open arthrotomy group), significantly shorter hospital stays and a lower rate of scarring due to the less invasive nature [16].

A recent study with a 2.5-year follow-up supported these results [9]. In these reports, all repeated drainage was done arthroscopically, and it was safe for even very young children.

In a 7-year follow-up comparative study of arthroscopic washout vs. open arthrotomy, Johns et al. reported reduced rates of repeat drainage, earlier knee range of motion and weight-bearing in the arthroscopic arm; however, these trends did not reach a statistically significant difference [17].

In a series of 76 children with arthroscopically-treated septic arthritis, a combination of arthroscopic lavage and antibiotic therapy successfully eradicated infection in 91% patients, and open revision was only required in 4% of these cases [18].

In summary, arthroscopic washout is a useful procedure for the treatment of pediatric septic arthritis, but the evidence is weaker than in the adult literature. Limited sample size and an absence of randomized clinical trials are evident in both knee and hip SA in the pediatric setting. Thus, there is no definitive evidence to support arthroscopic washout over open arthrotomy in children.

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QUESTION 4: Should the length of antibiotic usage be different for a primary septic arthritis (SA) versus osteomyelitis (OM)?

RECOMMENDATION: Although there is a tendency towards prescribing a longer course of antibiotics in pediatric patients with OM compared to primary SA, this practice is not based on conclusive evidence.

LEVEL OF EVIDENCE: Limited

DELEGATE VOTE: Agree: 93%, Disagree: 2%, Abstain: 5% (Super Majority, Strong Consensus)

RATIONALE

For decades, it has been believed that a prolonged course of antibiotic therapy (four to six weeks) is necessary to improve long-term outcomes when treating OM and SA in children [1–3]. In recent years, the efficacy of prescribing a prolonged course of antibiotics in the treatment of SA has begun to be questioned. Recent studies, including clinical trials, have demonstrated that a shorter duration (less than one week) of antibiotic therapy, in particular intravenous antibiotics, is effective in treating selective groups of pediatric patients with musculoskeletal infection while reducing length of stay, complications and healthcare costs [4–9].

Jagodzinski et al. demonstrated in a prospective study that three to five days of parenteral antibiotic therapy was sufficient for treating osteoarticular infection in children [10]. However, the Infectious Diseases Society of America (IDSA) currently recommends

a six-week course of antibiotics are administered to children with methicillin-resistant *Staphylococcus aureus* (MRSA) infection of the musculoskeletal system [11].

There is also no consensus or published studies about the optimal transition time from intravenous to oral antibiotic therapy in pediatric osteoarticular infection. There is, however, agreement in clinical practice that a transition from parenteral to oral antibiotics should occur when clinical signs and serum laboratory markers improve [12–14].

An extensive search of the literature revealed 33 retrospective observational studies related to management of pediatric musculoskeletal infections. The median length of antibiotic usage in these studies ranged from two to five weeks for SA patients and three to eight weeks for OM patients. Many of these studies had small sample sizes, short follow-up duration and heterogeneous patient populations, thus precluding meaningful comparison. In studies analyzing both SA and OM populations, a longer duration of antibiotics was consistently reported for OM patients [15–17].

There have been no high-level studies examining the appropriate length of antibiotic treatment for pediatric patients with SA vs. OM. In the absence of such concrete evidence, it remains unclear if the length of antibiotic treatment should be different for primary SA vs. OM. From the results of review of the available literature, it appears that uncomplicated cases of SA may be treated with a shorter duration of antibiotics than OM. This aligns with current guidelines from the European Society for Pediatric Infectious Diseases as well as the Australasian Society for Infectious Diseases, which both recommend an average of two to three weeks of antibiotics in SA and three to four weeks of antibiotics in OM [18,19]. Australian Therapeutic Guidelines suggest similar durations of three weeks in SA and three weeks minimum in OM [20,21]. However, length of antibiotic usage should be evaluated individually and guided by clinical response. There is a paucity of data on antibiotic duration in neonates, immunocompromised patients, patients with bone abscesses, those with chronic OM and infections caused by MRSA. The optimal length of therapy in these groups is yet to be defined. Thus, larger prospective randomized clinical trials of methodological rigor are required.

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QUESTION 5: Do steroids have a chondroprotective effect in children with septic arthritis (SA)?

RECOMMENDATION: Based on available pre-clinical and clinical studies it appears that the concurrent use of corticosteroids and antibiotics may have a protective role in the management of SA in the pediatric patient population.

LEVEL OF EVIDENCE: Limited

DELEGATE VOTE: Agree: 58%, Disagree: 20%, Abstain: 22% (Simple Majority, NO Consensus)

RATIONALE

SA can lead to severe joint disabilities in about 30% of affected children. These disabilities include restriction of bone growth, chondral destruction, stiffness, pathologic fracture, limb-length discrepancy, subluxation and chronic dislocation of the joint [1,2].

The processes leading to these sequelae are thought to be due more to inflammatory responses than direct damage caused by