

# Oral treatment of osteoarticular infections caused by *Kingella kingae* in children

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Dear Editor,

The therapeutic approach to musculoskeletal infections in pediatric patients has been substantially modified, particularly due to the increasing use of sequential therapy consisting of initial intravenous antibiotics quickly followed by a short course of oral antibiotics (1). To our knowledge, there is no series published on patients entirely treated with oral antibiotics. In the Pediatric Rheumatology Unit of our tertiary care hospital, oral treatment is offered to children diagnosed with osteoarticular infection (OAI), acute hematogenous osteomyelitis (OM), and septic arthritis (SA) and with suspected *Kingella kingae* (*K. kingae*) infection and who meet the following criteria: Age less than 4 years old, with good general condition and possibility of follow-up as outpatients.

A retrospective chart review (February 2013 to February 2016) was performed, and *K. kingae* infections microbiologically confirmed by blood culture, specific real-time polymerase chain reaction (PCR) using primers directed against the rtxA gene (kin-F GAACTAGGGATTGCTCGATTAC) and (kin-R CAATATTGCT-GAACTGCCTAGG), and/or synovial fluid culture were analyzed. PCR results are usually available in the first 24 h. As recommended, synovial fluids were inoculated in blood culture bottles (2).

During the study period, 12 patients with *K. kingae* infections were detected (10 with AS and 2 with OM), all less than 24 months of age, and they comprised the study group. Blood culture was positive in 3 patients, synovial fluid culture in 3, and PCR in 7. No patient with confirmed *K. kingae* infection required admission. The median delay from disease onset to diagnosis was 4 (range, 0-12) days.

All children with synovitis underwent arthrocentesis and washout before receiving oral treatment (cefuroxime axetil or amoxicillin-clavulanic acid) and were managed through scheduled visits to the hospital. In the first 4 days, even with clinical improvement, some patients had moderate swelling, and arthrocentesis was performed a second time (7 patients, 58%). The mean length of treatment was 23 (range, 21-28) days. All patients completely recovered without sequelae in the one-year follow-up visit.

To our knowledge, this is the first series in children with *K. kingae* OAI, who were entirely treated with oral antibiotics. In some countries, *K. kingae* has become the causal agent of OAI in children younger than 4 years, yielding a lower C-reactive protein (CRP) level than other agents and it is also probably a less severe infections (3, 4). In our series, oral treatment from the start demonstrated complete resolution in 100% of the patients. The early onset of antibiotic therapy, the young age of the patients, and the increased bone vascularization due to infection, particularly in younger children, might explain the good response to exclusively oral treatment. In addition, in antibiotics in which minimal inhibitory concentration is important (as in cephalosporins), slow oral absorption may be as effective as intravenous bolus infusion (5, 6).

In spite of our small number of patients in our study, the retrospective design, and the absence of a control group, we suggest that candidates for exclusively oral treatment are patients younger 2 years, in a good general condition, in whom *K. kingae* is suspected as the causative agent, and who can be closely followed as outpatients. This decision must be taken with caution and supervision (particularly in the first 24-48 h) because if *Staphylococcus aureus* is suspected, intravenous treatment should be started. Prospective studies are necessary to corroborate this hypothesis.



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## References

1. Pääkkönen M, Peltola H. Bone and Joint Infections. *Pediatr Clin N Am* 2013; 60: 425-36. [\[CrossRef\]](#)
2. Perez A, Herranz M, Padilla E, Ferrer F. [Usefulness of synovial fluid inoculation in blood culture bottles for diagnosing *Kingella kingae* septic arthritis: state of the question]. *Enferm Infecc Microbiol Clin* 2009; 27: 605-6. [\[CrossRef\]](#)
3. Chometon S, Benito Y, Chaker M, Boisset S, Ploton C, Bérard J, et al. Specific real-time polymerase chain reaction places *Kingella kingae* as the most common cause of osteoarticular infections in young children. *Pediatr Infect Dis J* 2007; 26: 377-81. [\[CrossRef\]](#)
4. Ceroni D, Cherkaoui A, Ferey S, Kaelin A, Schrenzel J. *Kingella kingae* osteoarticular infections in young children: clinical features and contribution of a new specific real-time PCR assay to the diagnosis. *J Pediatr Orthop* 2010; 30: 301-4. [\[CrossRef\]](#)
5. Pelkonen T, Roine I, Cruzeiro ML, Pitkäranta A, Kataja M, Peltola H. Slow initial  $\beta$ -lactam infusion and oral paracetamol to treat childhood bacterial meningitis: a randomised, controlled trial. *Lancet Infect Dis* 2011; 11: 613-21. [\[CrossRef\]](#)
6. Tøttrup M, Bibby BM, Hardlei TF, Bue M, Kern-Jespersen S, Fuursted K, et al. Continuous versus short-term infusion of cefuroxime: assessment of concept based on plasma, subcutaneous tissue, and bone pharmacokinetics in an animal model. *Antimicrob Agents Chemother* 2015; 59: 67-75. [\[CrossRef\]](#)