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Editorial

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Causative Pathogens and Antibiotic Resistance in Infectious Arthritis

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▸ See the article "Clinical Characteristics and Causative Pathogens of Infective Arthritis and Risk Factors for Gram-Negative Bacterial Infections" in volume 52 on page 503.

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Osteoarticular infections often require long-term treatment ranging from weeks to months. In some cases, the causative strain cannot be identified even in a diagnostic test; hence, empirical treatment is needed. The selection of an empiric antimicrobial regimen for osteoarticular infections should be based on consideration of the most likely causative pathogens and knowledge of local susceptibility patterns. However, there is a lack of data on osteoarticular infection in Korea. *Staphylococcus aureus* is the most common causative agent of osteoarticular infections, followed by *Streptococcus* species and Gram-negative bacteria. With the recent increase in the incidence of healthcare-associated osteoarticular infections worldwide [1], antimicrobial resistance in bacteria that cause osteoarticular infections has also been increasing, hampering the selection of appropriate antibiotic therapy for osteoarticular infections.

In a study by Lee et al., methicillin-resistant *S. aureus* (MRSA) was identified as the causative agent in 39% of the total cases of *S. aureus* arthritis. The MRSA ratio was three times higher in healthcare-associated infections than in community-acquired infections [2]. This finding is similar to that reported by a previous domestic study in which MRSA was identified as the causative agent in 44% of the overall cases of *S. aureus* osteoarticular infections [3]. MRSA has also been reported to be the causative agent in 38 - 43% cases of native vertebral osteomyelitis in Korea [4, 5]. Lee et al. showed that a high MRSA ratio was associated with high resistance rates to ciprofloxacin (34.3%) and clindamycin (42.9%) in cases of *S. aureus* infection [2]. Although the clinical data on early conversion from intravenous to oral antibiotics for osteoarticular infections caused by methicillin-susceptible *S. aureus* are relatively abundant, the clinical data on early switch to oral antibiotics for MRSA osteoarticular infections are insufficient [6, 7]. Therefore, the high MRSA prevalence due to the increased incidence of healthcare-associated infections in osteoarticular infections has become an obstacle for clinicians in choosing oral therapeutic agents.

Lee et al. reported that 14% of the cases of infectious arthritis were caused by gram-negative bacteria, and the ciprofloxacin resistance rate was 57.0% [2]. The prevalence of bacteriuria is high in elderly women, and urinary tract infections caused by gram-negative bacteria is a common source of hematogenous osteoarticular infections in this population. Fluoroquinolone, is an important oral antimicrobial agent, is used for the treatment of osteoarticular infections due to its high bioavailability and good penetration into bone and joint tissue [8]. Attention should be paid to the fluoroquinolone resistance in cases of urinary tract infections, which is constantly high or increasing in Korea [9].

Lee et al. reported that bacteriuria, hip joint infection, and steroid infection were independent risk factors of infectious arthritis caused by Gram-negative bacteria [2]. The hip joint is a difficult site for intra-articular procedures, and only one of 18 infected patients had a history of intra-articular procedures [2]. This data indicated that hematogenous spread may be possible mechanisms of development of hip joint arthritis. Urinary tract infection is a common cause of hematogenous osteoarticular infection caused by Gam-negative bacteria in elderly individuals. Therefore, urinary tract infection rather than hip joint infection itself may be an independent risk factor for Gram-negative arthritis. Some physicians claim that asymptomatic bacteriuria should be treated before and after prosthetic joint surgery for prevention of prosthetic joint infection. In a large-scale study that included 2,497 cases of joint surgery, patients with asymptomatic bacteriuria had a higher rate of prosthetic joint infection than those without asymptomatic bacteriuria (4.3% *vs.* 1.4%; $P = 0.001$). In addition, Gram-negative bacteria tended to be more common in the group with asymptomatic bacteriuria than in the group without asymptomatic bacteriuria [10]. Nevertheless, the effect of asymptomatic bacteriuria treatment on the prevention of prosthetic joint infection is unclear; hence, asymptomatic bacteriuria treatment is not generally recommended. Further research is needed on this matter.

This study is welcome as it analyzed the distribution of causative bacteria and susceptibility patterns of infectious arthritis in Korea [2]. The results of this study [2] are likely to provide invaluable information, which can be used to update the current Korean guidelines for osteoarticular infections. This study is limited by no strict definition of prosthetic joint infection and its small sample size. In the future, additional studies evaluating the distribution of causative bacteria and susceptibility patterns in patients with prosthetic joint infection in Korea are required.

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