Septic Arthritis and Prosthetic Joint Infections in Older Adults

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KEYWORDS

• Prosthetic joint infection • Septic arthritis • Biofilm • Older adult

KEY POINTS

- Comorbid conditions and frailty render older adults vulnerable to infections of both native and prosthetic joints.
- Joint infections are associated with loss of joint function and mobility as well as high morbidity among older adults.
- Joint infections are difficult to diagnose; a combination of clinical signs, culture results, and other diagnostic tests are required for appropriate identification of these deep-seated infections.
- Optimization of modifiable and nonmodifiable risk factors aid in the prevention or reduction of the burden of joint infections in older adults.

INTRODUCTION

The incidence of infections in both native joints (ie, septic arthritis) and prosthetic joints, is increasing. This increase is linked to the aging of our populations, which leads to a potential reduction in immune responses, more degenerative joint diseases, more hip fractures, and increased use of invasive joint operations.[1] These infections are associated with high morbidity among older patients, including potential loss of joint function and mobility.[2] The aim of this review is to summarize existing information on septic arthritis and prosthetic joint infection (PJI), including the epidemiology,

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pathogenesis, clinical manifestations, diagnosis, management, and prevention of these infections.

SEPTIC ARTHRITIS

The diagnosis of septic arthritis can be particularly challenging in patients with underlying joint disorders that are common in older adults. Mortality from bacterial arthritis in adults ranges from 10% to 25%.[3]

Epidemiology

Burden

The incidence rates of septic arthritis in the developed world range from about 2 to 7 cases per 100,000 person-years and seem to be increasing.[4] Several factors account for this: an aging population, more orthopedic and invasive procedures, and more frequent use of immunosuppressive therapies.[5] Geirsson and colleagues[4] evaluated changes in the rate of septic arthritis among Icelandic adults, finding that between 1990 and 2002, the incidence in adults increased by 0.61 cases per 100,000 population per year. They further reported iatrogenic causes for 42% of septic arthritis cases (77/184) in adults owing to arthrocentesis (33 cases), open joint surgery (26 cases), and arthroscopy (18 cases). A similar study in New Zealand also found an increased rate of septic arthritis disease in older adults, although with a lower rate of iatrogenic (42/248 cases; 16.9%).[6]

Risk factors

Risk factors of septic arthritis, as determined by a large, prospective study of patients with joint diseases over a 3-year period, were age 80 years or greater, diabetes, rheumatoid arthritis, hip or knee prostheses, and skin infection.[7] Immunosuppression is also a risk; a large, prospective, observational study in England indicates that patients with rheumatoid arthritis who are treated with tumor necrosis factor inhibitors are at increased risk for septic arthritis.[8] The most common route for the pathogen to enter a joint is via hematogenous spread. Older adults are particularly susceptible to this route of infection because of primary diseases affecting their joints, like rheumatoid arthritis and crystal arthritides, and because of comorbid conditions that include diabetes, skin infections, and cancer. Other routes include direct inoculation such as through trauma, or rarely, iatrogenic, such as therapeutic intraarticular corticosteroid injection.[5,9]

Clinical Manifestations

The most typical presentation is a few days of redness, warmth, pain, and swelling with decreased range of motion of the involved joint.[10] Suspicion for septic arthritis needs to be maintained even if the patient lacks symptoms of systemic infection like fever. It has been reported that only about 30% to 40% of patients with septic arthritis have a temperature of greater than 39°C.[11]

Typically, septic arthritis is monoarticular with predominant involvement of large joints like the knees, but the possibility of polyarticular involvement needs to be considered, especially in adults with underlying joint diseases like rheumatoid arthritis (**Box 1**). Dubost and colleagues[12] reported 25 cases of polyarticular septic arthritis over a 13-year period and cautioned that "septic polyarthritis should be considered even when the clinical picture is not florid—when patients have low fever and normal white blood cell counts." Polyarticular septic arthritis has been thought to represent an average of about 15% of the septic arthritis cases in the literature.[12] Atypical joint