

Septic Arthritis, Early Recognition and Responsibility of Family and Medical Physicians, Nurses and Radiology Team

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Abstract

When infectious arthritis is diagnosed and treated as soon as possible, it can help prevent major morbidity and mortality of the condition. When monoarticular joint pain, erythema, fever, and immobility all appear suddenly, it is reasonable to suspect that the patient is suffering from sepsis. On the other hand, constitutional signs including fever, chills, and rigors are not very sensitive to the presence of septic arthritis. The purpose of this study is to address the importance that medical treatment and early recognition play in the diagnosis and treatment of septic arthritis, as well as the significant function that family and medicine physicians, nursing, and radiological assessment play in the process. Antibiotic treatment administered early has been shown to greatly enhance the prognosis in high-income settings; but, if treatment is delayed, the patient's ability to recover without complications is hindered. Symptomatic osteoarthritis and avascular necrosis of the femoral head are two examples of complications that often develop gradually over time.

Keywords: *arthritis, sepsis, diagnosis.*

Introduction

An infectious etiology, such as bacterial, fungal, mycobacterial, viral, or other pathogens, can lead to septic arthritis, which is an inflammation of the joints that is caused by an infectious agent. Monoarticular arthritis is the most common form; however, polyarticular septic arthritis, which affects many joints or joints of a lesser size, can also develop. In the United States, monoarticular arthritis is a major source of disability and a prevalent condition that patients arrive with when they visit the emergency department (ED). There is a vast variety of possible causes for monoarticular arthritis, which can range from being completely harmless to being extremely dangerous. A patient who suffers from monoarticular arthritis may be suffering from septic arthritis, which is one of the most alarming causes. The prevalence of septic arthritis among emergency department patients who have monoarticular arthritis varies greatly from study to study; nonetheless, the literature suggests that there are between four and sixty instances of septic arthritis for every 100,000 people in the population each year.¹⁻⁶ There is evidence in the literature that immunocompromised patients and those with prosthetic joints have higher rates of septic arthritis. In these patients, the frequency of the disease climbs to 70 cases per 100,000 patients yearly.⁰⁷⁻¹³ [1,2] Septic arthritis has a bimodal incidence, meaning that it is more common in children and individuals over the age of 55. The incidence is highest in children.

Septic arthritis is characterized by a bacterial infection of the joint space, which, if left untreated, can lead to the fast destruction of joints within a matter of days. Mortality rates can be rather high, from three to twenty-five percent. In spite of the severity of the illness, septic arthritis may be difficult to diagnose, as many patients do not exhibit the typical signs, symptoms, or laboratory findings associated with the condition. There are also a huge variety of illnesses that can produce symptoms that are similar to those of septic arthritis, which further complicates the diagnosis [3].

One joint is normally affected by septic arthritis, however in as many as twenty percent of cases,

the condition can affect multiple joints (this occurs most frequently in immunocompromised patients). Once again, the knee is the joint that is impacted the most frequently, followed by the hip, the shoulder, and the elbow. As a result of the absence of a protective basement membrane within the joint lining, septic arthritis is caused by bacteremia in seventy percent of cases. The germs are able to enter the synovial fluid with relative ease as a result of this. Other reasons include contiguous spread from osteomyelitis, an abscess, cellulitis, or septic bursitis [4,5]. Both direct inoculation from trauma or a medical procedure and contiguous spread from these conditions are also possible.

Review:

There are between two and six instances of septic arthritis for every one hundred thousand persons, however the total number of cases can vary depending on the presence of risk factors. When compared to adults, children are more likely to suffer from septic arthritis. With a male predominance of two to one, the incidence of septic arthritis reaches its highest point between the ages of two and three years. A number of subgroups of children who are at a greater risk include neonates, hemophiliacs with hemarthroses, immunocompromised children (such as those with sickle cell anemia or human immunodeficiency virus infection), and children who have been treated with chemotherapy. The following are some of the risk factors that are associated with sepsis in adults: age greater than 80 years old, diabetes mellitus, rheumatoid arthritis, recent joint surgery, joint prosthesis, previous intra-articular injection, skin infections and cutaneous ulcers, human immunodeficiency virus, osteoarthritis, sexual activity (especially in cases of suspected gonococcal septic arthritis), and other causes of sepsis [6,7].

It is estimated that roughly fifteen percent of cases are caused by Gram-negative organisms, whereas the bulk of cases are caused by Gram-positive organisms such as *Staphylococcus aureus*. Septic arthritis caused by methicillin-resistant *S. aureus* (MRSA) is becoming more common; this trend is expected to continue.

Neisseria gonorrhoeae is another common cause in younger adults; patients who have this infection may present with migratory polyarthritides, pustular rash, urethritis, and tenosynovitis. Examples of polymicrobial infections are *Pantoea agglomerans* and *Nocardia asteroides*. These infections generally manifest themselves following penetrating trauma, such as bite wounds, or in conjunction with organic foreign material. Gram-positive bacteria are able to enter the body through small cracks in the skin and mucous membranes. On the other hand, Gram-negative infections are caused by the use of injectable drugs, sources throughout the gastrointestinal tract, or injuries to the mucosal lining of the urinary tract. In the event that bacteria are found within the generally sterile synovial fluid, the body will dispatch immune cells to the location where the infection is occurring. The presence of bacteria within the joint capsule, the inflammatory response of the host, and tissue ischemia can all contribute to the development of substantial joint injury [8,9].

The clinical and radiological characteristics of septic arthritis need to be diagnosed as quickly as possible. Additionally, in order to make a differential diagnosis, it may be essential to conduct an investigation of a needle biopsy material. This is due to the fact that other disease entities may exhibit symptoms that are comparable to those of septic arthritis. In the event that a joint is suspected of being infected, radiologists may be asked to perform an emergency aspiration. Those who are responsible for doing aspiration procedures should be familiar with an imaging-guided arthrocentesis approach that is both safe and successful, and that can be adapted to the specific joint that is affected as well as the individual patient doing the surgery [10].

For the purpose of enhancing nurses' knowledge and confidence in their ability to recognize and manage patients who have septic arthritis, it is necessary to establish a more robust foundation in septic arthritis education and training programs, as well as to adopt septic arthritis screening tools and care packages [11].

Acquiring a complete medical history and doing a thorough evaluation of potential risk factors

might provide valuable insights into the diagnosis. It is possible for a provider's pre-test probability of septic arthritis to be considerably altered by a thorough assessment of risk variables. gives information about the sensitivity, specificity, positive likelihood ratio (+LR), and negative likelihood ratio (-LR) for a variety of findings from the history and examination.⁸ Notable is the fact that this table brings together the results of multiple meta-analyses.^{8,9} Because of the variability and untrustworthy methodology of the studies that were included, several of the findings could not be brought together for the purpose of data pooling. Although prior joint illness or damage is the most common risk factor, it is interesting to note that this condition is only present in a minority of individuals who have septic arthritis.⁶⁻⁸ Ten In most cases, additional risk factors are associated with the manner in which the infection was transmitted. These include hematogenous transmission (for example, the use of injectable drugs), direct inoculation (for example, trauma or a recent treatment), or contiguous spread (for example, an abscess) [12].

Despite the fact that each risk factor, when considered on its own, has only a marginal influence on the probability of developing septic arthritis, the overall risk increases as the number of risk variables increases simultaneously. A significant number of people who suffer from septic arthritis have many risk factors. Rheumatoid arthritis sufferers, for instance, have a higher likelihood of developing septic arthritis due to the damage that occurs to their joints, the poor quality of their skin, and the immunosuppression that they experience. Approximately twenty-two percent of all patients who were diagnosed with culture-proven septic arthritis did not have any related risk factors or underlying joint illness, according to the findings of one article.³⁰ % In young patients with joints that are otherwise normal, this can be partially explained by septic arthritis caused by *N. gonorrhoeae*; nevertheless, the majority of cases of septic arthritis were caused by *S. aureus* [13].

Joint discomfort, soreness to palpation, swelling, erythema, warmth, and uncomfortable

or limited range of motion are some of the signs and symptoms that patients typically present with when they are diagnosed with this condition. Joint pain stands out as the most prevalent symptom, since it is experienced by 85 percent of patients. It has been suggested that joint soreness is one hundred percent sensitive, while joint swelling occurs in seventy-eight percent of instances. Up to 58% of patients might have a fever that is higher than 39 degrees Celsius, and the lack of fever should not be relied upon to rule out the diagnosis. On the other hand, it has been demonstrated that up to 90% of patients have a low-grade fever that is higher than 37.5 degrees Celsius. Pain in the joints that comes on suddenly lends more credence to the possibility of an underlying pathology in the joints, such as septic arthritis. It is possible that an intra-articular infection is present in a joint that is painful and has a restricted range of motion, both actively and passively [14].

There is insufficient evidence to rule out septic arthritis using serum blood testing. When it comes to diagnosing septic arthritis, the test consisting of synovial fluid is considered to be the gold standard. In spite of the fact that a complete blood cell count, C-reactive protein (CRP), and erythrocyte sedimentation rate (ESR) are frequently obtained, the findings of these tests will not be able to significantly reduce the post-test likelihood in order to have an impact on the decision to retrieve synovial fluid. There is a possibility that the white blood cell (WBC) count in the serum is higher than 10×10^9 /liters (L), but the sensitivity is between 42 and 90 percent, and the positive limit of detection (+LR) is only 1.4 (95% confidence interval [CI] [1.1–1.8]). The sensitivity of ESR varies depending on the particular cut-off value that is used, with a sensitivity of 66% for 15 mm/hr and a sensitivity of more than 90% for 30 mm/hr [15].

Conclusion:

Septic arthritis should be rapidly considered and diagnosed in any patient who presents with sudden joint pain, swelling, and fever, without

any history of trauma. Septic arthritis is more likely to occur in individuals who are over 80 years old, have diabetes mellitus, rheumatoid arthritis, have recently undergone joint surgery, have hip or knee prostheses, have a skin infection, or are using immunosuppressive medications. An interruption in the identification and medical care can lead to lasting illness and death. Physical examination findings and blood markers, such as erythrocyte sedimentation rate and C-reactive protein, can aid in the diagnosis, however they lack specificity. Confirmation of the diagnosis necessitates the examination of synovial fluid. History and Gram stain are helpful in deciding the initial choice of antibiotics. *Staphylococcus aureus* is the predominant pathogen found in cases of septic arthritis, while other microorganisms such as bacteria, viruses, fungi, and mycobacteria can also be responsible for the condition. If there is a clinical suspicion of septic arthritis, it is recommended to start empiric antibiotic treatment after obtaining synovial fluid. In the majority of situations, oral antibiotics can be used as they are equally effective as intravenous medication. The therapy's overall length varies from two to six weeks, although specific illnesses may necessitate extended treatment periods. Septic coxitis and transitory synovitis in children with acute hip pain have distinct treatment modalities and prognoses. However, these two diseases share similar symptoms in the early stages, making differentiating diagnosis challenging. In order to distinguish between these two disorders, the authors assessed the clinical, serologic, and radiologic results and aimed to identify features that could serve as diagnostic criteria. Nurses are strategically positioned to identify and treat patients with septic arthritis. Consistent with other research, this multisite investigation identified deficiencies in nurses' clinical understanding of septic arthritis identification and treatment.

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