CASE REPORTS

Primary Meningococcal Septic Arthritis of the Knee by *Neisseria meningitidis* Serotype Y

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ABSTRACT

Neisseria meningitidis infection should be considered in patients presenting with septic arthritis especially if Gram-negative diplococcic are observed on Gram-stain.

Keywords: *Neisseria meningitides*, primary meningococcal septic arthritis

Artritis Séptica Meningocócica Primaria de la Rodilla por *Neisseria meningitidis* Serotipo Y

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RESUMEN

La infección por Neisseria meningitidis *se debe considerar en pacientes con artritis séptica, especialmente si se observan diplococos Gram negativos en la tinción de Gram.*

Palabras claves: Artritis séptica meningocócica primaria, *Neisseria meningitidis*

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INTRODUCTION

Arthritic manifestations are known to occur during *Neisseria meningitidis* infection. However, primary meningococcal arthritis (PMA) has been reported in the literature as a rare condition outside of the clinical syndrome of acute meningococcaemia or meningitis. We describe a case of PMA in an elderly woman without the clinical syndrome which is known to be associated with meningococcaemia.

CASE REPORT

A 90-year old woman presented to the Emergency Department complaining of an acutely painful and swollen left knee. She was afebrile and other vital signs were normal. An orthopaedic surgery consultation was obtained and aspiration of the left knee yielded 100 mL of purulent synovial fluid. The fluid was sent to Microbiology for culture and susceptibility testing. In addition, the fluid was examined for the presence of crystals. The peripheral blood white cell count was 21.3 x 10^3/UL with an absolute neutrophil count of 18.3 x 10^3/UL, platelets 387 x 10^3/UL, haemoglobin 9.8 g/dL and erythrocyte sedimentation rate 76 mm/hour. Microscopic examination of the Gram-stained smear revealed numerous polymorphonuclear neutrophils with intracellular Gram-negative diplococci. In addition, calcium pyrophosphate crystals were seen on the smear. The patient had no signs or symptoms suggestive of meningitis or meningococcaemia. Blood cultures taken before the antibiotic therapy were negative after five days incubation. However, the culture plates from the aspirate grew *N meningitidis* and the patient was started on ceftriaxone 2 g intravenously every 24 hours. The organism was sent to a specialty laboratory in the United States of America (USA) for further identification and serotyping and it was confirmed as *N meningitidis* serogroup Y. The patient completed a 21-day course of ceftriaxone followed by oral ciprofloxacin 500 mg twice daily for 21 days and resolution of her condition occurred.

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DISCUSSION

There are currently 13 meningococcal capsular polysaccharide serotypes. However, serotypes A, B, C, Y and W135 are known to be associated with serious meningococcal disease. Furthermore, it has been reported that in the USA, the majority of infections are caused by serotypes B, C and Y (1). A case of PMA caused by *N meningitidis* serotype X, in a previously undiagnosed HIV-infected patient has been reported in the literature (2). A rare clinical scenario of a patient with PMA caused by *N meningitidis* serotype C, without the clinical syndrome associated with meningococcaemia has also been reported in the literature (3). Our patient was found to be infected with *N meningitidis* serotype Y. The isolation of *N meningitidis* serotype Y from the elbow of a 12-year old girl with complement deficiency due to hereditary C2 insufficiency presenting with PMA has recently been reported (4). We have no evidence to suggest that our patient was immunocompromised or immuno-suppressed.

It has been well established that *Staphylococcus aureus* and Streptococcal species are the predominant organisms responsible for causing septic arthritis (5). Invasive meningococcal disease is primarily a bloodstream infection with dissemination to other sites in the body such as the large joints (6). However, *N meningitidis* is a less common cause of septic arthritis but is known to be associated with certain forms of arthritic manifestations and some of these are indistinguishable from disseminated *N gonorrhoeae* septic arthritis (7). Primary meningococcal arthritis is a form of septic arthritis with isolation of the organism from blood cultures and synovial fluid in the majority of cases (2). It has been proposed that PMA is a rare form of meningococcal disease outside the clinical syndrome of acute meningococcaemia or meningitis and the underlying mechanism for the disease involves blood stream infection with subsequent bacterial invasion of the synovium (8). We consider that this patient's *N meningitidis* septic arthritis resulted from asymptomatic carriage, and possibly an initial acute viral illness which subsequently led to disruption of the epithelium, facilitating meningococcal invasion and subsequent blood stream infection. It is important to note that without drainage and intravenous antibiotic management, disseminated meningococcal infection with subsequent arthritis may lead to joint destruction. Microbiological analyses of synovial fluid and blood cultures play a pivotal role in identifying the causative agent of patients presenting with septic arthritis. *N gonorrhoeae* and *N meningitidis* should be considered as possible agents if Gram-negative diplococci are observed on Gram-stain of synovial fluid from patients presenting with arthritic manifestations.

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