

## Septic Arthritis as Sole Manifestation of Invasive Meningococcal Disease: Case Report

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### Abstract

*Neisseria meningitidis* infection is usually manifested by severe invasive disease such as meningitis and septicemia, other uncommon presentation include vasculitis, dermatitis and arthritis which have been reported exceptionally as the sole manifestation of the disease.

Here we are reporting a case of adult Bahraini male with background of diabetes mellitus, presented with meningococcal septic oligoarthritis involving one knee, one wrist and both ankles without clinical features of meningitis and with no past history of joint disease or trauma. Serogroup B meningococcal species was isolated from the blood and was resistant to quinolones. Intravenous infusion of ceftriaxone for two weeks followed by oral cefixime for further two weeks was successful in returning all joints to their full functional status without any residual joint symptoms.

**Keywords:** Septic Arthritis; Invasive Meningococcal Disease; *Neisseria meningitidis*

### Introduction

Meningococcal disease is a vaccine preventable infection that is commonly presented as meningitis, fulminant septicemias or combination of both and it carried high morbidity and mortality if not diagnosed and treated promptly [1]. Arthritis is one of the uncommon complications that can be encountered with a prevalence range of 2% to 10% of all meningococcal infection [2,3].

Two main types of meningococcal arthritis have been described; septic arthritis which result from direct invasion of the organism into the joint cavity which tend to occur early at the disease onset and the second type is the immune mediated arthritis which usually present late in the course of illness during or after the recovery of sepsis [4].

This case report demonstrates an unusual presentation of invasive meningococcal disease, where the early microbiological diagnosis, combined with the appropriate antimicrobial therapy prevent the complications.

### Case Presentation

32 year old Bahraini male known case of diabetes mellitus type 2 presented to accident and emergency department with history of fever and joint pain of three days duration. The patient complained of rigors and shivering during the fever attacks with temporary response

to antipyretics, he complained also of pain in right wrist joint followed by involvement of left knee then both ankles, the pain was progressively increasing over the three days, then by the third day started to be accompanied by joint swelling and limitation of movement.

He has no history of gastrointestinal, respiratory or genitourinary symptoms. He did not complain of photosensitivity, headache or rash. He gave history of recent travel to Azerbaijan, however, no contact with animals or any marine activities was given.

There is family history of gout in both his brother and father, but no history of autoimmune disease was elicited in any of his family members.

### Physical examination and investigation

The patient was conscious, alert and oriented. He did not appear in significant pain. He had no neck stiffness with negative Kirng's and Brudzinkin's signs. Respiratory, cardiovascular, neurological and abdominal systems were all normal. No rash was seen.

Musculoskeletal examination revealed left knee effusion with limited range of motion and mild tenderness. Both ankles were mildly swollen with minimal limitation of movement due to pain. Right wrist joints were minimally swollen but with full range of movement, other joints were all normal.

His initial lab investigation revealed leukocytosis of 13 with neutrophil of 82% and thrombocytopenia of 75, the peripheral smear showed thrombocytopenia with no fragmented red blood cells. The CRP was grossly elevated of 289 mg/L. the liver function, syphilis serology, coagulation study were all normal.

Based on history, physical examination and initial lab investigation, the patient was admitted with clinical impression of autoimmune arthritis and managed with nonsteroidal anti-inflammatory agents, but oligoarticular septic arthritis was also considered as potential differential diagnosis and the patient was started empirically on cloxacillin after blood culture collection to avoid missing an infected joint considering the risk of irreversible loss of joint function accompanying any delay in the initiation of antimicrobial therapy.

Aspiration of knee joint was planned, but the patient was not willing for that, further testing included vasculitis screen, hepatitis profile, viral serology for EBV, CMV, dengue fever and HIV test were all within normal range.

By second day of admission, result of blood culture were informed that it grew *Neisseria meningitidis* type B which was resistant to ciprofloxacin but sensitive to ceftriaxone, accordingly; cloxacillin was changed to Ceftriaxone.

Forty eight hours after starting Ceftriaxone the fever subsided then by third day his ankle and wrist pain and swelling improved and almost disappeared by end of the first week. However, the knee pain persisted till the second week but with less severity. He received 14 days of intravenous Ceftriaxone and then discharged home on oral cefixime 400mg once daily for two weeks.

He was seen in the clinic after two weeks. The CRP normalized and he convalesced satisfactorily from arthritis, and there are no symptoms of recurrence to date.

### Discussion

The incidence of meningococcal disease showed great variability in different part of the world depending on the implemented vaccination policy and many other factors such as the socioeconomic status and overcrowdings [5-8].

Highest incidence encountered in the meningitis belt of sub-Saharan Africa which is considered as high endemic areas (average annual incidence > 10 per 100,000 population with repeated outbreaks. Most other part of the world are considered as low to intermediate in endemicity with variable incidence of 0.2 - 10 cases per 100,000 population with few sporadic cases and occasional cluster and outbreaks.

In the Kingdom of Bahrain, Invasive meningococcal disease has become a rare disease since the introduction of the vaccine in 2001, since then there are only few sporadic cases reported every 2 - 3 years with yearly incidence of 0- 0.1case per 100,000population [9,10].

All cases of Invasive meningococcal disease reported in the kingdom of Bahrain over the past 10 years presented with meningitis or meningococcal sepsis, this case that we are reporting is the first case to be reported in Bahrain with meningococcal arthritis [9,10].

Worldwide published data revealed that around 2% - 10% of all invasive meningococcal infection might be complicated by arthritis, but reporting arthritis as the sole manifestation of the disease is relatively rare occurrence [2,3].

Diagnosing such cases can be really challenging specially that sometime it is difficult to confidently discriminate infectious from non-infectious causes of joint inflammation based on the observed pattern of affected joints, such as in this patient who had multiple joint involvement with no any rash or hemodynamic instability which was more in favor of non-infectious etiology [11].

A study done by Masson-Behar, *et al.* [12] in 2017 reported a case series of 7 patients with arthritis that was associated with meningococcal disease. The majority of patients had serotypes B and C as a cause of invasive meningococcal disease. The arthritis was mainly oligoarticular and the knee was the commonest site. This is similar to our reported case where serotype B was isolated and the patient had his knee as the main joint affected in addition to a lesser extent his ankles and wrist.

The arthritis described in that case series [12] were classified as septic, immunomediated or combination of both. Out of the 7 cases illustrated, five had septic arthritis, 4 had immune-mediated and 2 had combination of both, our patient had the picture of septic arthritis as it developed as part of the initial presentation of his illness almost the same time with the onset of fever, though we were unable to confirm that by joint aspiration as the patient was not willing for the procedure.

### Conclusion

This case report demonstrates an unusual presentation of invasive meningococcal disease where physicians must be aware of such presentation as the early appropriate antimicrobial therapy can save the patient life and prevent further complications.

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