

Clinical Case Report

Primary meningococcal polyarthrititis in a young man

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ABSTRACT

We report a rare occurrence of primary meningococcal polyarthrititis in a 19-year-old man. The fluid in the elbow joint showed Gram-negative diplococci but the culture was sterile. The diagnosis was confirmed by polymerase chain reaction targeting *crgA* gene of *Neisseria meningitidis*.

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INTRODUCTION

Arthritis in meningococcal disease is not uncommon. Primary meningococcal polyarthrititis is, on the other hand, a rare form of meningococcal disease presenting as septic arthritis without other signs of meningococcal disease. We report the case of a 19-year-old man presenting with polyarthrititis without a clinical syndrome associated with meningococcaemia.

THE CASE

A 19-year-old man presented to the hospital with a 3-day history of intermittent high grade fever, pain in both knee, ankle, elbow and wrist joints and purpuric erythematous rash for the past 2 days over both lower limbs. Joint pain was associated with swelling and difficulty in movements. There was no history of chills and rigors. There was no history of diarrhoea, vomiting, headache, altered sensorium or seizures. There was no history of antibiotic intake.

On physical examination, the patient was febrile with palpable purpura present over both lower limbs (periarticular rash), had synovitis with effusion in both knees, both wrists and left elbow; the left wrist was swollen and tender and both ankles were tender. However, the small joints were normal. There were no signs of meningeal irritation and the patient was conscious, well-oriented with a pulse rate of 74 per minute; blood pressure of 110/70 mmHg; and respiratory rate of 22 per minute. There was no lymphadenopathy and systemic examination of the patient was normal.

At admission, the haemoglobin was 12.2 g/dl, total leucocyte count 13 200/ μ l, differential count showed 74% polymorphs and 26% lymphocytes, platelet count 185 000/ μ l and erythrocyte

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sedimentation rate 58 mm/first hour. The renal and liver function tests were within normal limits. The other investigations showed calcium 11 mEq/L, phosphorus 3.5 mEq/L, uric acid 3.8 mg/dl, sodium 140 mEq/L, potassium 4 mEq/L. Chest X-ray, electrocardiogram and X-ray of the knees showed no abnormality.

Joint fluid aspirated from the left elbow was purulent. Microscopic examination following Gram-stain showed abundant polymorphonuclear cells with both extra and intracellular Gram-negative diplococci (Fig. 1). The sample was plated on blood agar, chocolate agar, MacConkey agar and showed no growth after 48 hours of incubation. The blood culture was sterile even after 7 days of aerobic incubation.

Based on the clinical presentation and microscopic findings, the joint fluid was subjected to polymerase chain reaction (PCR) for *Neisseria meningitidis*. DNA was extracted from the synovial fluid using the QIAamp DNA Mini kit according to the manufacturer's instructions.

PCR was done to amplify a 230 bp fragment of *crgA* gene using primers 5' GCTGGCGCCGCTGGCAACAAAATTC 3' and 5' CTTCTGCAGATTGCGGCGTGCCGT 3'.¹ The conditions for *N. meningitidis* PCR were modified as follows: Denaturation at 92 °C for 30 seconds, annealing at 60 °C for 30 seconds and extension at 72 °C for 55 seconds for a total of 30 cycles. An amplified product of 230 bp was seen on agarose gel (Fig. 2).

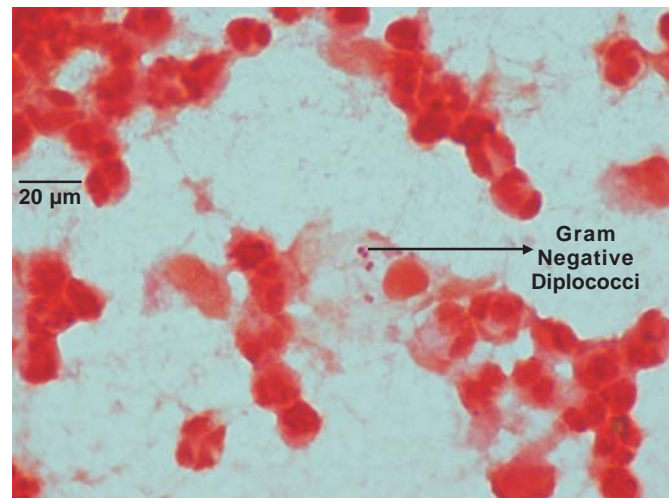


FIG 1. Gram-stained smear of synovial fluid showing Gram-negative diplococci

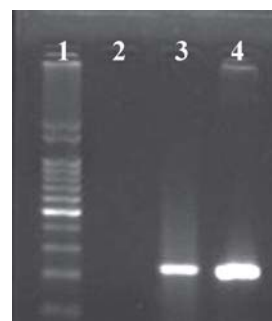


FIG 2. Detection of *N. meningitidis* by *crgA* PCR with DNA extracted from synovial fluid of suspected patient (lane 3) and *N. meningitidis* (ATCC 13077 serogroup A) (lane 4). Lane 1 contains 100 bp DNA marker and lane 2 contains blank.

The patient was thus diagnosed to be a case of primary meningococcal polyarthritis and treated with intravenous ceftriaxone 2 g every 12 hours for 10 days. He responded well to treatment, became afebrile and the joint inflammation subsided. He was subsequently discharged on oral cephalosporin. PCR could not be done on the blood sample as the patient had been discharged and could not be contacted.

DISCUSSION

The most common clinical presentation of meningococcal disease is meningitis (50%) followed by meningococcaemia. Other less common presentations include pneumonia, epiglottitis, otitis media, conjunctivitis, urethritis, pericarditis and arthritis.^{2,3} Meningococcal infection associated arthritis can be divided into 3 different clinical scenarios. The most common presentation is as a complication of acute meningitis or meningococcaemia. This presentation can be either septic or aseptic when associated with immune complex deposition. The second presentation, which is much less common, can be due to chronic meningococcaemia leading to migratory arthritis or arthralgias. The third type is called primary meningococcal septic arthritis. This is an acute septic arthritis caused by *N. meningitidis* without evidence of meningitis or meningococcaemia.⁴

Although joint involvement is commonly seen with disseminated meningococcal disease, primary meningococcal septic arthritis is extremely rare. Whenever seen, it is a monoarthritis rather than polyarthritis. This is possibly the first report from India of primary meningococcal polyarthritis. Giamarellos-Bourboulis *et al.* reported 34 cases of primary meningococcal septic arthritis in the literature from 1980 to 2002.⁵ We have come across a few case reports.⁶⁻¹⁰ A majority of patients with primary meningococcal septic arthritis are febrile (89%) at the time of presentation. Contrary to the case of our patient, a history of upper respiratory tract infection has been reported commonly; one study reported up to 50% of patients with such a history.⁴ In another case series, erythematous maculopapular skin rash was reported in about 30% of patients with primary joint involvement.¹¹

Considering that primary meningococcal septic arthritis is rare

and the clinical presentation is similar for septic arthritis, it can be easily misdiagnosed or dismissed as post-inflammatory arthritis, particularly if it is polyarticular. Identification of *N. meningitidis* is essential for appropriate treatment. Microscopy helps in rapid presumptive identification of the organism and guides empirical treatment. However, culture is not sensitive enough, being positive in 40% and 90% for blood and synovium, respectively.¹² This could be one of the reasons why synovial fluid and blood cultures were sterile in our case. This emphasizes the importance of molecular methods to confirm the aetiological diagnosis.

Conclusion

Primary meningococcal arthritis is a rare condition which needs to be considered in the diagnosis of septic arthritis. Accurate identification and appropriate treatment are essential to manage this condition.

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