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RESEARCH ARTICLE

PRIMARY MENINGOCOCCAL ARTHRITIS: A CASE REPORT

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Abstract

Neisseria meningitidis is a gram-negative diplococcus often associated with invasive infections such as meningitis and fulminant sepsis. primary meningococcal septic arthritis (PMSA) is extremely rare. Diagnosis should be prompt and is based on isolation of the germ from synovial fluid or blood culture. This observation reports the case of a 6-year-old girl who presented to the pediatric emergency room with a painful right knee associated with fever and purpuric spots. The neurological examination was strictly normal with no signs of meningeal involvement. Arthrotomy and drainage were performed. The cytobacteriological examination of the synovial fluid allowed the isolation of a strain of *N. meningitidis* sensitive to ceftriaxone on culture media. Intravenous antibiotic therapy was then started. The patient improved after adequate treatment.

Conclusion: This observation illustrates an unusual presentation of *Neisseria meningitidis* infections. Prompt bacteriological diagnosis and early treatment combining antibiotics and joint drainage prevented complications in this patient.

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Introduction:-

N. meningitidis is associated with severe infections such as meningitis and septicemia. In 3% of cases, *N. meningitidis* infections may have atypical presentations such as arthritis [1, 2, 3] which represent 1 to 2% of all septic arthritis [4].

This observation reports a rare case of *N. meningitidis* primary arthritis of the right knee in a 6-year-old child.

Case Report:

A 6-year-old girl with no particular pathological history was admitted to the pediatric surgery department for a febrile functional impairment of the right knee that started two days earlier with no context of trauma. Clinical examination revealed a swollen, red and painful right knee with flexion deformity, associated with purpuric spots. Apart from these spots, the rest of the clinical examination, especially neurological examination, was normal. Biological investigations revealed an inflammatory syndrome with hyperleukocytosis (14600 leukocytes/mm³ with

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predominance of neutrophils at 11052 and elevation of the C-reactive protein (CRP) (251 mg/l). The radiological assessment revealed no abnormalities (no bone lysis, erosions, soft tissue swelling or demineralization).

Faced with this inflammatory joint inflammation, an arthrotomy to evacuate the pus as well as a joint fluid puncture were performed, bringing back abundant citrine yellow fluid with lumps of pus.

Early antibiotic therapy, based on 1000 mg 3 times a day of amoxicillin clavulanic acid association and 90 mg a day of gentamycin, was then started while waiting for the results of the synovial fluid bacteriological examination.

Synovial fluid direct examination was negative and revealed the presence of neutrophils at 70%. Cytologic examinations showed the presence of 1500 leukocytes/mm³ and 8000 red blood cells/mm³. Cultures performed on agar media and incubated at 37°C under CO₂ were positive with translucent colonies with regular edges on chocolate agar (**figure 1**).

The analysis of these colonies using MALDI-TOF mass spectrometry identified a strain of *Neisseria meningitidis*. Latex agglutination serotyping showed that it belonged to group B.

The determination of minimal inhibitory concentrations (MIC) was carried out using E-test strips on agar media following the standards of the AntibioGram Committee of the French Society for Microbiology (AC-FSM) and revealed a phenotype of *Neisseria meningitidis* that was susceptible to penicillin and Ceftriaxone with a Ceftriaxone MIC less than 0.016 mg/l.

No cerebrospinal fluid puncture had been performed because there was no meningeal involvement and the patient was in a good general state.

Clinical and biological outcomes were rapidly favorable, with good response to treatment within 10 days. The patient became afebrile, her knee was no longer painful and her CRP levels steadily decreased (Figure 2).

An investigation was initiated in search for at-risk contacts in the patient's family.

Discussion:-

There are several types of meningococcal arthritis, which were initially described by Shaad [5]: septic arthritis, either mono or polyarticular and associated with either sepsis or meningitis, aseptic arthritis associated with meningococcal disease, probably related to immuno-inflammatory mechanisms [6,5] and finally, primary meningococcal septic arthritis (PMSA) which is the rarest of all [5,6,7,8].

In PMSA, the disease occurs preferentially in children under 4 and over 15 years of age (8). It is usually mono-articular (52 to 84%), mainly affecting the knee (9,8), but also the ankle, hip and elbow (10,11,12). Thus, PMSA should not be excluded in arthritis affecting other joints than the knee in children.

Microbiological analysis of synovial fluid and blood cultures confirms the diagnosis of PMSA. Because of specific growth requirements, isolation of *Neisseria meningitidis* in the laboratory can sometimes be difficult, as in the study by Cartolano et al. in France, where cultures of joint fluid on solid media remained sterile, whereas *N. meningitidis* was isolated from a blood culture bottle inoculated with joint fluid [13]. In order to have good chances of identifying such a germ during septic arthritis [14], urgent inoculation of joint fluid in a blood culture bottle at the patient's bedside is particularly interesting, even in the case of prior antibiotic therapy and low bacterial load.

The polymerase chain reaction (PCR) can be used to identify meningococcal strains, with comparable validity to culture-based diagnosis, in cases where microscopic examination and cultures are negative, thus allowing the diagnosis to be made [15].

N. meningitidis isolates are serologically characterized based on capsular polysaccharides. This patient had a serogroup B, which is consistent with the high prevalence of this serogroup in Morocco (75% of invasive infections) [16].

The treatment should be initiated immediately once the diagnosis is established; there are no specific guidelines for the treatment of PMSA. It is based on a combination of an intravenous penicillin-based antibiotic, which is the antibiotic of choice for meningococcal infections, and joint drainage either by arthrocentesis or arthrotomy, which is usually necessary to lower the bacterial load and recover the knee range of motion[17].

Declaration of interest:

The authors declare that they have no conflicts of interest in relation to this article.

Ethical statement:

The authors declare that the present work did not involve experimentation on humans or animals.

List of Figures

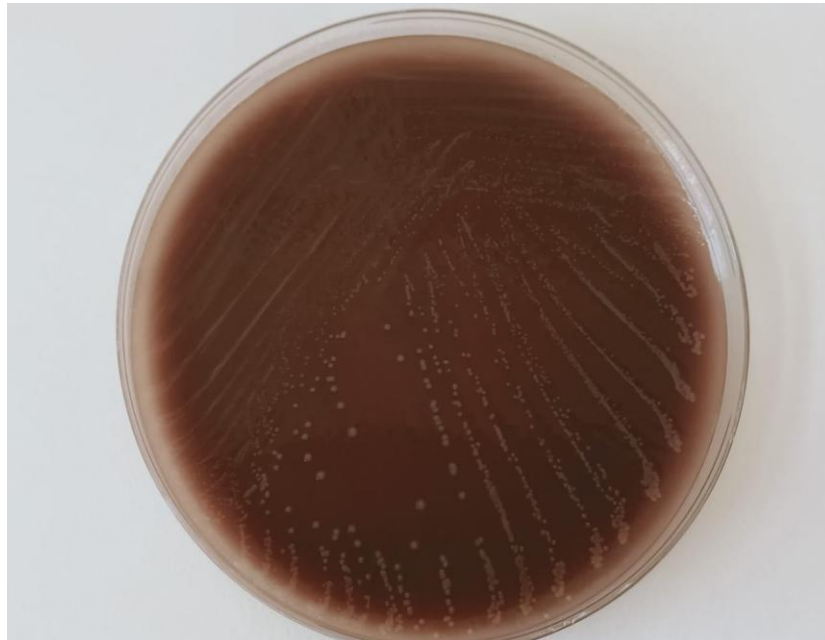


Figure 1:- Positive culture with translucent colonies of *Neisseria meningitidis*.

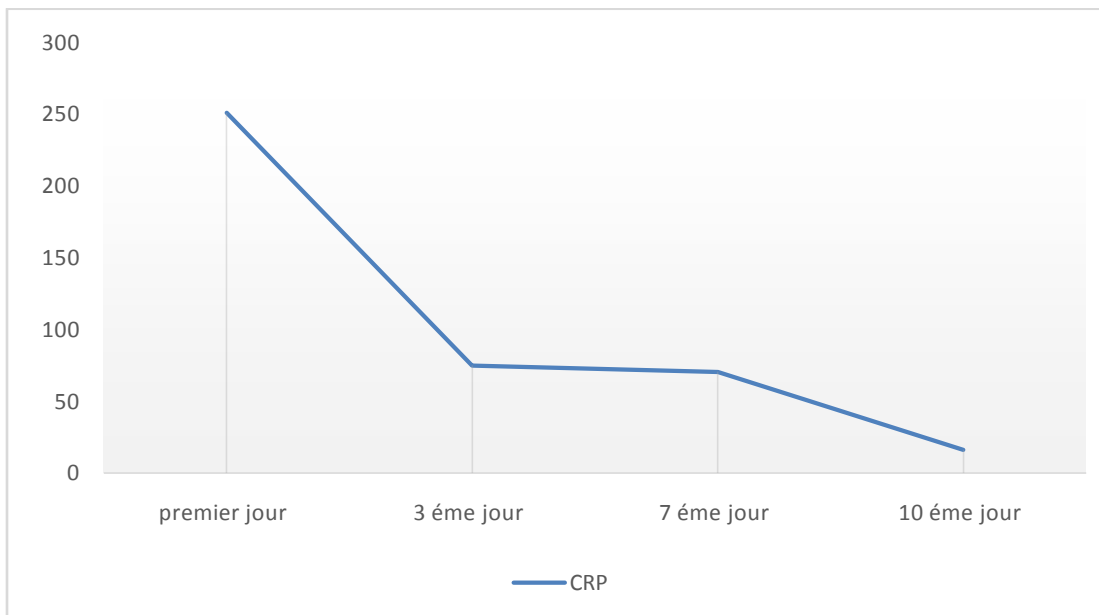


Figure 2:- Sérum CRP analysis curve.

Conclusion:-

It is important that physicians become more aware of unusual presentations of meningococcal infections such as PMSA. With prompt diagnosis and early treatment with antibiotics and joint drainage, the prognosis is excellent.

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