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Case Report

Gonococcal arthritis and C2 deficiency[☆]

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ABSTRACT

Disseminated gonococcal infection is a rare presentation of the sexually transmitted pathogen, *Neisseria gonorrhoeae*. Here, we report the case of a 64-year-old woman with disseminated gonococcal infection, which started with symptoms of oligoarthritis and malaise. *Neisseria gonorrhoeae* was identified in the carpal synovial fluid. The follow-up study revealed an absence of total hemolytic complement and complement C2 was not detected. Being relatively common, C2 deficiency has been associated with disseminated gonococcal infection in a few cases. We present a new case and discuss those previously published.

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Artritis gonocócica y déficit de C2

RESUMEN

La enfermedad gonocócica diseminada es una manifestación infrecuente de la afectación por *Neisseria gonorrhoeae*, que presenta una clínica variada y no bien definida, siendo la afectación articular un hallazgo característico. Presentamos el caso de una mujer de 64 años con enfermedad gonocócica diseminada de inicio agudo, que comenzó con deterioro generalizado y oligoartritis. Se realizó artrocentesis de carpo, obteniéndose un líquido sinovial de aspecto purulento, cuyo estudio microbiológico identificó *Neisseria gonorrhoeae*. En el estudio se objetivó un complemento hemolítico total (CH50) de cero, no detectándose la fracción C2 del complemento. Son muy pocos los casos descritos en la literatura de enfermedad gonocócica diseminada asociada a déficit de C2. Presentamos un nuevo caso y revisamos los previamente publicados.

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Palabras clave:

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Introduction

Disseminated gonococcal disease (DGD) is an infection caused by *Neisseria gonorrhoeae* (*N. gonorrhoeae*) that is transmitted by sexual contact and principally produces joint manifestations. It can appear as the typical triad of polyarthralgia, rash and tenosynovitis or as purulent arthritis without other lesions. Both presentations can overlap or progress from one to the other.

Clinical observation

A 64-year-old female, with no known drug allergies. A medical history of recurrent bronchitis in youth. Operated for a left Colles' fracture. No regular medical treatment. She attended the emergency department due to a 4-day history of pain and oligoarthritic inflammation associated with liquid stools and sensation of dysthermia, with no other associated symptoms. No skin lesions. Last sexual intercourse was one week earlier with usual partner. No recent travel. No domestic animals.

On physical examination, fair general condition, afebrile, blood pressure 130/76 mmHg, heart rate 107 beats per minute. Important inflammatory signs (oedema, erythema, heat and functional limitation) of both carpi (Fig. 1), second metatarsophalangeal joint and left sternoclavicular joint were observed. No rash, adenopathies,

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Fig. 1. Arthritis of both carpi with tenosynovitis.

oral and/or genital ulcers, or skin lesions. The rest of the examination was normal.

Laboratory tests revealed leukocytosis (20,900/ μ L) with neutrophilia, elevation of inflammatory parameters (erythrocyte sedimentation rate 115 mm/h and C reactive protein 200 mg/L) and renal failure (creatinine 2.27 mg/dL). High-resolution ultrasound of the swollen joints and magnetic resonance imaging of the left carpus confirmed the presence of polyarthritis, tendosynovitis and paratendonitis. Arthrocentesis of carpus was performed, obtaining a very small amount of purulent synovial fluid that was sent for culture. Blood cultures, stool culture, urine culture and polymerase chain reaction were performed for *C. trachomatis*, *N. gonorrhoeae* and *T. vaginalis* in urine, serologies (HIV, syphilis, hepatitis A, B and C, cytomegalovirus, Epstein Barr virus, herpes virus), cervical and vaginal sampling for culture and detection of *T. vaginalis*, *Mycoplasma/Ureaplasma*, *N. gonorrhoeae*. Given the clinical findings and the appearance of the joint fluid, empirical treatment was started with cloxacillin and intravenous ceftriaxone.

N. gonorrhoeae was isolated 24h later in the joint fluid, and the antibiotherapy was adjusted with ceftriaxone 2 g/24h and azithromycin 1 g in a single dose. The strain showed sensitivity to ceftriaxone, cefixime and ciprofloxacin. In addition, the polymerase chain reaction amplified the *N. gonorrhoeae* genome in urine. Blood cultures, stool cultures and serology were negative. The autoimmune study was negative. Total haemolytic complement (CH50) was zero, and C2 complement fraction was not detected.

Our patient was diagnosed with disseminated gonococcal disease, showing a combination of arthralgia, tenosynovitis and polyarticular purulent arthritis.

After 2 weeks of treatment with ceftriaxone, the patient improved clinically and analytically, but presented beta-lactam-induced toxicoderma, and ceftriaxone was substituted with quinolones. The patient received 8 weeks of antibiotic treatment with complete resolution of the infectious process. On discharge, vaccination against capsulated germs was recommended. Follow-up at 12 months showed that the disease had been cured.

Discussion

N. gonorrhoeae is an aerobic gram-negative diplococcus, a human pathogen that is transmitted by direct contact with the urogenital, anal and oropharyngeal tracts, causing local infection¹ or invasive disease, known as DGD.² DGD includes signs such as polyarthralgia, tenosynovitis and rash, which is the classical triad, or

true arthritis, usually monoarticular, associated with positive synovial fluid cultures. Joint involvement in any of the forms appears in 42%–85% of cases of DGD.³ The polyarthralgias of the classical triad present asymmetrically; tenosynovitis is a more specific finding (50%–60% of patients), which leads to pain, swelling and periarticular erythema; skin involvement entails pustules or vesiculopustular lesions, classically distributed in the distal area of the extremities.⁴ Presentation as arthritis is acute onset, affecting the knees, wrists or ankles, and sternoclavicular arthritis is a rare form of presentation.⁵ Although the forms of presentation are usually differentiated, there may be overlap between them. In our case, in addition to the age of presentation, which was not usual since it generally affects young and healthy people, the patient's symptoms attracted our attention. A combination of the different clinical manifestations appeared simultaneously, with polyarthralgias, tenosynovitis and purulent oligoarthritis with positive culture, in addition to involvement of the sternoclavicular joint, which is infrequent.

Some factors predispose to the dissemination of *N. gonorrhoeae*, such as pregnancy,⁵ HIV infection, lupus⁶ or late complement factor deficiencies,⁷ association with C2 deficit, as in our case, is rare. On reviewing the literature, we only found 2 cases where a deficit of this complement factor^{8,9} was associated with DGD. This fact is striking, since the susceptibility of C2 deficient individuals to infections by other encapsulated bacteria is well known. As previously suggested, DGD is a potential indication for the study of complement deficiencies, and our case is further evidence for this recommendation.¹⁰

A diagnosis of DGD is based on clinical symptoms, compatible epidemiology and isolation of *N. gonorrhoeae* from joint fluid and/or blood cultures by culture or genome detection by polymerase chain reaction. The treatment of choice is ceftriaxone 2 g/day for 7–10 days for disseminated disease, which can be changed to cefixime or oral quinolones if progress is favourable. Culture and antibiogram are recommended, as up to 30% of *N. gonorrhoeae* strains in our environment are resistant to quinolones, and 5% to third generation cephalosporins. Azithromycin 1 g (single dose) should be added due to the risk of other associated STDs. In the case of gonococcal arthritis treatment should be prolonged for a few weeks.

Conclusions

N. gonorrhoeae infection is an STD that constitutes a public health problem and is included in the group of Obligatory Declaration Diseases. In the presence of mono- or oligoarticular symptoms with associated tenosynovitis, differential diagnosis with DGD is important for the appropriate treatment and control of the disease.

Ethical responsibilities

Protection of people and animals. The authors declare that neither human nor animal testing has been carried out under this research.

Data confidentiality. The authors declare that they have complied with their work centre protocols for the publication of patient data.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

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Conflict of interests

The authors have no conflict of interests to declare.

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