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Original article

Clinical and microbiological findings of septic arthritis caused by *Haemophilus parainfluenzae*

Résultats cliniques et microbiologiques d'une arthrite septique due à Haemophilus parainfluenzae

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Abstract

Objectives. – To report a case of septic arthritis due to *H. parainfluenzae* and to review the clinical and microbiological characteristics of published case patients.

Patients and methods. – Data was collected on age, sex, infection localization, underlying risk factors, symptom onset-diagnosis interval, analytical findings, microbiological diagnosis, treatment, outcome, and follow-up of the present patient (presenting with septic arthritis of the pubic symphysis due to *H. parainfluenzae*) and those identified in a literature analysis.

Results. – Data of 18 patients, including 17 reported case patients, was collected. Mean age at presentation was 51 ± 9 years. Underlying diseases for septic arthritis were recorded in 11 patients. The infection site was the knee in eight patients, hip and/or acromioclavicular joint in five. Pain was observed in 15 patients and fever in 10; the mean symptom onset-diagnosis interval was 9.4 days. Diagnosis was obtained from synovial fluid aspirate in 12 patients and from blood cultures in four. Susceptibility of *H. parainfluenzae* strains was reported in 12 cases. Eight patients were treated with cephalosporins and 10 with penicillins. A favorable outcome was observed in 13 patients.

Conclusions. – Septic arthritis caused by *H. parainfluenzae* is a rare entity that requires a high level of suspicion before application of laboratory methods for rapid diagnosis and treatment.

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Keywords: Antibiotics; *Haemophilus parainfluenzae*; Synovial fluid; Pain; Septic arthritis

Résumé

Objectifs. – Présenter un cas d'arthrite septique due à *H. parainfluenzae* et examiner les caractéristiques cliniques et microbiologiques des cas publiés.

Patients et méthodes. – Les données ont été recueillies sur l'âge, le sexe, le site de l'infection, les facteurs de risque sous-jacents, l'intervalle entre l'apparition des symptômes et le diagnostic, les résultats analytiques, le diagnostic microbiologique, le traitement, le pronostic et le suivi du patient (atteint d'arthrite septique de la symphyse pubienne due à *H. parainfluenzae*) et ceux identifiés dans une recherche de la littérature.

Résultats. – Les données de 18 patients, dont 17 cas signalés, ont été recueillies. L'âge moyen à la présentation était de 51 ± 9 ans. Une comorbidité de l'arthrite septique a été observée chez 11 patients. Le site de l'infection était le genou chez huit patients, la hanche et/ou l'articulation acromioclaviculaire chez cinq patients. Une douleur était présente chez 15 patients et de la fièvre chez 10. L'intervalle moyen entre le diagnostic et l'apparition des symptômes était de 9,4 jours. Le diagnostic a été obtenu par ponction du liquide articulaire chez 12 patients et par hémoculture chez quatre patients. Une susceptibilité des souches de *H. parainfluenzae* a été signalée dans 12 cas. Huit patients ont été traités par céphalosporines et 10 par pénicillines. Une évolution favorable a été observée chez 13 patients.

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Conclusions. – L'arthrite septique due à *H. parainfluenzae* est rare et exige un niveau élevé de suspicion avant l'application des méthodes de laboratoire pour un diagnostic et traitement rapides.

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Mots clés : Antibiotiques ; Arthrite septique ; Douleur ; Liquide articulaire ; *Haemophilus parainfluenzae*

1. Introduction

Septic arthritis is considered a rheumatologic emergency that may cause irreversible local joint destruction and impairment if left untreated. It has also been associated with systemic infection and increased mortality [1]. *Neisseria gonorrhoeae* used to be a frequent etiology of septic arthritis in young sexually active adults, but *S. aureus* is now the most commonly isolated microorganism in arthritis. Staphylococci and streptococci account for 90% of cases [2], especially in patients presenting with rheumatoid arthritis [3]. Gram-negative pathogens, usually Enterobacteriaceae, are isolated from approximately 5–20% of patients and are more frequent among the elderly, children, immunosuppressed individuals, and intravenous drug users [4]. *Haemophilus parainfluenzae*, a Gram-negative rod, is a common inhabitant of the oral cavity and respiratory tract and is the usual etiological agent of respiratory tract infections. We recently encountered a case of septic arthritis due to this bacterium in a patient without underlying risk factors, prompting a search of available data on this very rare entity.

2. Methods

We report a case of septic arthritis due to *H. parainfluenzae* at our hospital. Following diagnosis, we undertook a search of the Medline, Web of science, CINAHL, and Cochrane systematic review databases to review previous reports of this rare condition, using the search terms “*Haemophilus parainfluenzae* septic arthritis” and “*Haemophilus parainfluenzae* joint infection”. References cited in the retrieved papers were also searched to detect additional case reports published before 1966. We obtained 17 cases of septic arthritis due to *H. parainfluenzae* that were described in sufficient detail for comparative purposes. Data on these 17 patients plus the present patient was analyzed, considering their age and sex, infection site, underlying risk factors, clinical manifestations, analytical findings, microbiological diagnostic method, treatment, outcome, and follow-up period.

3. Case report

A 55-year-old woman with a 6-month history of lower back pain receiving treatment with non-steroidal anti-inflammatory drugs, with no other disease of interest or risk practices, came to our Emergency department after detecting a suprapubic mass 1 week earlier and losing weight over the previous few months. The initial evaluation was normal and the physical examination was unremarkable, except for a mildly painful mass. The complete blood count, chemical profile, and urinalysis were normal, except for hemoglobin of 10.5 g/dL

and C-reactive protein (CRP) of 189 g/mL. A CT scan revealed a cystic lesion at the pubic symphysis and signs suggestive of arthritis, with no local lymphadenopathy. After 3 weeks of treatment with analgesics and anti-inflammatory drugs, synovial fluid (SF) was drawn from the pubis by puncture and sent to the hospital laboratory. The sample was inoculated after centrifugation in aerobic and anaerobic blood agar (BDTM Columbia Agar 5% Sheep blood, Becton Dickinson), chocolate agar (BDTM Chocolate Agar, Becton Dickinson) and thioglycollate broth (BDTM Fluid Thioglycollate Medium), all incubated at 37° C. The bacterium was identified by mass spectrometry (Bruker Biotyper[®], Billerica, MA, USA), and susceptibility to this strain was then tested by the E-test method in *Haemophilus* test medium (BDTM *Haemophilus* Test Medium Agar). A Gram stain revealed no microorganism. After 18 hours of incubation, pathogen growth was only observed on the chocolate agar. The isolate was susceptible to trimethoprim/sulfamethoxazole (0.023 µg/mL), amoxicillin/clavulanic acid (0.25 µg/mL), ampicillin (0.38 µg/mL), cefotaxime (0.016 µg/mL), levofloxacin (0.047 µg/mL), and resistant to azithromycin (6 µg/mL), as per CLSI criteria [5]. After 3 weeks of treatment with ceftriaxone (2 g/12 hrs.), the patient was discharged home with a prescription of levofloxacin (500 mg/24 hrs.) for 2 weeks. At the latest follow-up (3 months post-discharge), the patient was clinically stable with normal laboratory findings.

4. Results

4.1. Characteristics of all reviewed case reports

The literature analysis retrieved 17 case reports of septic arthritis due to *H. parainfluenzae*. The first case report was published by Renne et al. in 1976 [6]. Table 1 compiles clinical and microbiological data on all 18 case patients (including the present patient) considered in this study. Eleven (64.7%) were male, and the mean age was 51 ± 9 years (range <1–95 years). Six case patients were reported in the United States [6–11], two each in France [12,13], in the UK [14,15], and in Spain [16, and present report], and one each in South Korea [17], Australia [18], French Polynesia [19], Taiwan [20], Tunisia [21], and Canada [22]. Four case patients were excluded from the analysis for being abscesses and/or osteomyelitis [20,23–25].

The mean time from symptom onset to diagnosis, not reported for six patients, was 9.4 days (range: 2–60 days). Eleven patients (61.1%) had underlying risk factors for septic arthritis infection; one patient was co-infected with HIV [13]; four had prosthetic joints [8,9,14,15], two had malignant disease [12,13], one had

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