

Short duration antibiotic therapy for native joint arthritis caused by *Neisseria* infection?

We read with great interest the article “Two weeks versus four weeks of antibiotic therapy after surgical drainage for native joint bacterial arthritis: a prospective, randomised, non-inferiority trial” by Gjika *et al.*¹ As staff members of a French Regional Referral Centre for complex bone and joint infections, we want to share our experience with short-duration antibiotic treatment for native joint arthritis caused by *Neisseria gonorrhoeae* (Ng) and *Neisseria meningitidis* (Nm).

We conducted a retrospective study including all patients with arthritis caused by Gram-negative cocci treated in our institution from January 2018 to July 2020.

Ten patients were included (seven men, three women; median age 34 years; table 1). Most patients had monoarthritis (n=6); knees were the most frequently affected joints (n=7). Fever was inconsistent (n=5). Blood culture analyses were performed for nine patients and were positive for three patients. All but two patients (because absence of joint fluid) underwent joint aspiration. Direct examination and bacterial culture were positive in five and six of eight patients, respectively. Diagnoses were made using PCR of synovial fluid in two patients (#7 and #8) because their bacterial culture were negative without explanation (in particular no prior antibiotic therapy), antibiotic sensitivity could not be assessed for them. Six patients were infected with Ng and four with Nm. Ng was always resistant to ciprofloxacin and exhibited intermediate sensitivity to penicillin G. Nm was always sensitive to amoxicillin with a minimal inhibitory

Table 1 Patients' characteristics

	Gender, age (years)	Infected joints	Microbiological diagnosis			Bacteria	Treatment			Clinical outcome at 2 months
			Blood culture	Synovial fluid	Other		Antibiotic and duration	Surgery	Other	
1	M, 47	Left thumb, ankles	Positive	ND	Oropharyngeal Ng positive PCR	<i>Neisseria gonorrhoeae</i>	Ceftriaxone IV, 2 g/day, 7 days	No	NSAIDs, 2 weeks	Complete resolution
2	F, 45	Right knee	ND	▶ Direct examination: positive (GNC) ▶ Culture: positive ▶ PCR: positive	Oropharyngeal, genital and anal Ng PCR positive	<i>Neisseria gonorrhoeae</i>	Ceftriaxone IV, 2 g/day, 7 days	No	No	Complete resolution
3	M, 54	Left knee	Negative	▶ Direct examination: positive (GNC) ▶ Culture: positive ▶ PCR: ND	No	<i>Neisseria gonorrhoeae</i>	Ceftriaxone IV, 2 g/day, 7 days	No	No	Complete resolution
4	M, 54	Left knee	Negative	▶ Direct examination: positive (GNC) ▶ Culture: positive ▶ PCR: ND	No	<i>Neisseria gonorrhoeae</i>	Ceftriaxone IV, 1 g/day, 7 days	Yes	Evacuation punctures before surgery and NSAIDs, 4 weeks	Complete resolution
5	F, 18	Left hip	Positive	▶ Direct examination: positive (GNC) ▶ Culture: positive ▶ PCR: positive	No	<i>Neisseria meningitidis</i> C	Cefotaxime IV 200 mg/kg/day, then amoxicillin IV, 200 mg/kg/day, 10 days	Yes	NSAIDs, 2 weeks	Complete resolution
6	M, 18	Knees, elbows, ankles, shoulders,	Positive	▶ Direct examination: ND ▶ Culture: positive ▶ PCR: positive	No	<i>Neisseria meningitidis</i> C	Ceftriaxone IV 4 g/day, then amoxicillin IV 200 mg/kg/day, 7 days	No	NSAIDs, 2 weeks	Complete resolution
7	M, 28	Right knee and ankle	Negative	▶ Direct examination: negative ▶ Culture: negative ▶ PCR: positive	No	<i>Neisseria meningitidis</i> C	Ceftriaxone IV 2 g/day, 7 days	Yes	NSAIDs, 2 weeks	Complete resolution
8	F, 24	Right knee	Negative	▶ Direct examination: negative ▶ Culture: negative ▶ PCR: positive	Positive oropharyngeal, genital and anal Ng PCR	<i>Neisseria gonorrhoeae</i>	Ceftriaxone IV 2 g/day, 7 days	No	NSAIDs, 2 weeks	Complete resolution
9	H, 39	Left knee, right foot, right ankle, right hand	Negative	ND	Positive oropharyngeal Ng PCR	<i>Neisseria gonorrhoeae</i>	Ceftriaxone IV 2 g/day, 10 days	No	NSAIDs, 2 weeks	In progress
10	H, 16	Left hip	Negative	▶ Direct examination: positive (GNC) ▶ Culture: positive ▶ PCR: positive	No	<i>Neisseria meningitidis</i> W	Ceftriaxone IV 2 g/day, then amoxicillin IV 200 mg/kg/day, 7 days	Yes	NSAIDs, 1 week	In progress

CRP, C-reactive protein; F, female; GNC, Gram negative cocci; IV, intravenous; M, male; MIC, minimum inhibitory concentration; ND, not done; Ng, *Neisseria gonorrhoeae*; Nm, *Neisseria meningitidis*; NSAID, non-steroidal anti-inflammatory drug.;

concentration (MIC) <0.125 mg/L. The most common treatment was ceftriaxone for 7 days (n=7). Two patients with Nm infections (#5 and #6) received first-line cefotaxime and ceftriaxone, respectively; after determination of the MICs, amoxicillin was used, thus yielding total treatment intervals of 7 and 10 days. Four patients required surgical drainage (#4, #5, #7 and #10). Concomitant non-steroidal anti-inflammatory drugs (NSAIDs) were used in eight patients (naproxen or ketoprofen), for reactive arthritis-like symptomatology, usually for 2 to 4 weeks. With a minimum of 2-month follow-up, outcomes were favourable for 8 out of 10 patients.

Most of native septic arthritis are caused by Gram-positive cocci;² Gram-negative cocci septic arthritis are rare and occur in 1% to 3% of affected patients.^{3,4} While oligoarthritis or polyarthritis are reported as the most common clinical presentation in literature,^{4,5} we observed a majority of patients with monoarthritis, only one patient had oligoarthritis (#7) and three had polyarthritis (#1, #6 and #9). All patients exhibited arthritis in a large joint. The diagnosis of native arthritis can be made using blood cultures, direct examination and synovial fluid culture. Species-specific PCR can be performed to determine the presence of Ng in synovial fluid and specimens from other sites (eg, oropharyngeal, genital and rectal). Antibiotic susceptibility must be determined. Ng is typically resistant to penicillin and fluoroquinolones.⁴ Nm is frequently sensitive to amoxicillin and third-generation cephalosporins.⁶ The optimal therapy has not been established but our retrospective study supports the following hypothesis: ceftriaxone for Ng or amoxicillin for Nm (after determination of the MIC) for 7 days appears to be effective; surgical drainage is not required, except in patients for whom the infection cannot be controlled; meningococcal arthritis more frequently required surgery.

Overall, our study highlighted a completely different management of native joint arthritis due to Ng and Nm compared with others septic arthritis.² Since it is a rare condition with scarce literature, one can consider shorter antibiotics duration of 7 to 10 days (ceftriaxone 2 g/day for Ng and amoxicillin 100 to 200 mg/kg/day for Nm). Surgical drainage is not always mandatory. Finally, NSAIDs are often required and can be safely used in combination with antibiotics, if needed.

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