

## CLINICAL VIGNETTE

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# *Neisseria meningitidis* Urethritis: An Uncommon Common Disease

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### Case 1

A 35-year-old male with no prior medical history presented to urgent care at a safety-net hospital with a complaint of green discharge from his penis soaking his underwear for 1 week. The discharge was associated with pain in the shaft of the penis and testicles and burning with urination. He had not had vaginal intercourse but reported engaging in oral sex 2 to 3 weeks ago with multiple female partners. He denied any history of same sex partners.

On exam, vital signs were within normal limits. Physical exam was significant for tenderness along the penile shaft, testicles, and epididymis. Green purulent discharge was visualized at the meatus. No erythema or other deformities were noted.

Urinary dipstick testing showed clear, yellow urine with a 1.030 specific gravity, small bilirubin, pH of 6, 0.2 mg/dl urobilinogen, small blood, negative glucose, large ketones, 1+(30 mg/dl) protein, negative nitrite, and small leukocytes. Additional laboratory test results at the time of visit were negative for HIV antibodies and non-reactive RPR. Chlamydia and Gonorrhea nucleic acid amplification (NAAT) tests from the penile discharge and a urine culture were sent.

Patient was diagnosed with epididymitis and treated empirically for sexually transmitted infections with 250mg of ceftriaxone intramuscular and 1 gm azithromycin orally. In addition, a ten-day course of Doxycycline 100mg twice a day was given. The patient was advised to alert past sexual partners of probable sexually transmitted infection and the need for treatment. He was counseled on safe sex practices and advised against sexual activity for 2 weeks.

Results of sent laboratory tests were negative chlamydia and negative gonorrhea by NAAT. Urine culture was positive for *Neisseria meningitidis*.

### Case 2

A 26-year-old male presented to the same urgent care clinic with two days of dysuria and penile discharge. He denied any complaints with ejaculation. Has reported a history of *N. gonorrhoeae* previously that was treated. He endorsed multiple female sexual partners recently. Patient did not provide history of oral sex.

On exam, vital signs and physical exam were unremarkable. Genitourinary exam revealed no gross abnormalities, penile discharge, tenderness on palpation of penis or testicles.

Urine dipstick testing showed hazy, yellow urine with a specific gravity of 1.020, pH 6, Trace protein, 3+ leukocytes, <2 mg/dL urobilinogen and negative glucose, ketones, bilirubin, blood. Microscopic urine exam revealed 3/HPF RBCs, 69/HPF WBC, 2+/HPF Bacteria, Squamous Epithelial cells present. HIV ab testing was negative and RPR was non-reactive. Chlamydia and Gonorrhea NAAT from the patient's discharge and urine culture were sent.

The patient was empirically treated with ceftriaxone 250mg IM and azithromycin 1g orally in clinic. Patient was instructed to inform his multiple partners to seek treatment.

GC and Chlamydia tests were negative. Urine culture was positive for *Neisseria meningitidis*.

### Discussion

*N. meningitidis* is a gram negative intracellular diplococcus that has been commonly associated with CSF infection and bacteremia.<sup>1</sup> However, since the 1940, case reports have reported its ability to cause a variety of genitourinary infections, most commonly in the form of male urethritis.<sup>2</sup> *N. meningitidis* colonizes the epithelial cells of the oropharynx in approximately 5-10% of the population, with epidemiologic studies suggesting that it is then transferred to the male genital tract through oral sexual activity.<sup>1,3</sup> Most of cases have been associated with heterosexual oral sexual contacts in young adults.<sup>1,3</sup> As in our patients, the clinical presentation typically involves dysuria and purulent discharge from the penis, mirroring what is seen in cases of urethritis caused by more typical pathogens such as *N. gonorrhoeae* as well as *C. trachomatis*.<sup>1,3-5</sup> All serotypes of *N. meningitidis* have been described in case reports, though unencapsulated organisms predominate.<sup>3</sup> In addition, a novel non-groupable subtype has been described which may have an enhanced ability to infect the male genital tract.<sup>1,3,6</sup>

It is difficult to know the true prevalence of both urogenital disease and colonization as *N. meningitidis* is not currently included in any US surveillance program.<sup>1</sup> Much of what is known about the disease comes from case series of males

presenting to STI clinics included in the CDC's Gonococcal Isolate Surveillance Project (GISP).<sup>1</sup> In GISP, culture data is obligatory, by contrast, most clinical centers typically test males using GC/CT nucleic acid amplification testing (NAAT). However, *N. meningitidis* does not typically cross react with these PCR primers and thus infection is typically identified in the subset of patients who get gram stain and culture of urethral discharge or of the urine as in our two cases.<sup>3,5</sup> This highlights the importance of providing empiric treatment for patients presenting with typical symptoms of an STI, rather than waiting for results from NAAT. To date, in contrast to *N. gonorrhoeae*, no significant resistance has been described to the standard regimen of ceftriaxone 250 mg and Azithromycin 1 gm and other CDC recommended regimens for empiric treatment of STI's are also acceptable.<sup>1,2,5</sup>

Some studies suggest that reinfection is possible, however, to date no recommendations exist for partner treatment in the absence of symptoms.<sup>1</sup> In addition, while cervicitis has been described, little is known about the spectrum of clinical and subclinical disease in women, making this an important area for future investigation. Finally, studies have suggested that vaccination against Meningococcal serotype B is likely at least partially protective and additional research is needed to determine optimal non-barrier strategies for prevention.<sup>2</sup>

These two cases, presenting to the same urgent care show how a pathogen that commonly causes CSF infections and bacteremia can be the uncommon cause of urethritis. This should be kept in mind as a possible cause of infection when evaluating and treating patient with dysuria and penile discharge.

## REFERENCES

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