

Endophthalmitis resulting from gonococcal keratoconjunctivitis

R. Bollam¹, M. Yassin¹ and T. Phan²

1) Department of Medicine, University of Pittsburgh Medical Center and 2) Division of Clinical Microbiology, University of Pittsburgh and University of Pittsburgh Medical Center, Pittsburgh, PA, USA

Abstract

Neisseria gonorrhoeae is a global pathogen with significant morbidity. This bacterium is one of the common causes of sexually transmitted diseases; however, ocular gonococcal infection is rare. The gonococcal ocular infection can lead to ulcerative keratitis and/or corneal perforation. We report a case of endophthalmitis resulting from gonococcal keratoconjunctivitis. Sexual transmission could not be proven in this patient.

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Corresponding author. T. Phan, Division of Clinical Microbiology, University of Pittsburgh Medical Center, University of Pittsburgh Medical Center, 3477 Euler Way, Room 6027, Pittsburgh, PA 15213, USA.

E-mail: phantg@upmc.edu

The sexually transmitted infection caused by *Neisseria gonorrhoeae* remains a major public health concern [1]. The World Health Organization estimates around 87 million new infections per year globally [2]. Gonococcal keratoconjunctivitis is rare in adults. The infection often results from autoinoculation or inoculation of infected genital secretions from a sexual partner [3]. Accurate diagnosis and prompt treatment of the adult gonococcal keratoconjunctivitis is important because it can cause corneal perforation [4]. Here we present a case of endophthalmitis resulting from gonococcal keratoconjunctivitis. Sexual transmission could not be proven in this patient.

A 62-year-old woman with history of asthma sought care at the emergency department with pain and swelling of the left eye associated with reduced visual acuity and ophthalmoplegia. Symptoms had been progressively worsening for 1 week. Notably, the patient complained of a productive cough, nasal congestion and fever for the past 2 weeks, but she did not

seek medical care. She smokes approximately a pack of cigarette per day and drinks alcohol regularly (approximately 2–3 beers per day). The patient denied illicit or intravenous drugs. The patient stated that she had not undergone any recent ophthalmic surgeries, but she had an eye procedure performed when she was a child, although she was unsure of the reason. Household members (husband and son) had no signs of conjunctivitis.

The patient was afebrile and denied any cough, sputum production and haemoptysis at presentation. The respiratory examination did not reveal any signs of respiratory distress or infection. Review of other systems was unremarkable, as were laboratory results. Examination of the left eye showed a diffusely erythematous conjunctiva, creamy discharge in the anterior chamber (hypopyon), ptosis and severe tenderness on palpation. She had light perception only in the left eye, and vision was 20/50 in the right eye. Detailed retinal examination revealed vitreitis with no evidence of retinal detachment. Orbital computed tomography revealed preseptal soft tissue swelling consistent with preseptal cellulitis (Fig. 1). The patient was diagnosed with endophthalmitis (anterior and post chambers). The patient underwent intravitreal aspiration and culture followed by injection of vancomycin, voriconazole and ceftazidime. She then received intravenous vancomycin and cefepime with tobramycin and moxifloxacin eye drops.



FIG. 1. Orbital computed tomography revealed preseptal soft tissue swelling consistent with preseptal cellulitis.

Gram staining of the conjunctival cultures revealed Gram-negative diplococci, and culture found *Neisseria gonorrhoeae*. Her blood and vitreous cultures remained negative. The eye discharge specimen from this patient was submitted to the clinical microbiology laboratory for bacterial culture. After 24 hours of incubation at 35°C in a 5% CO₂ atmosphere, round-shaped and clear colonies grew on chocolate agar and sheep's blood agar (tryptic soy agar containing 5% defibrinated sheep's blood). No growth was noted on MacConkey and Columbia CNA agars. Microscopic examination of a Gram-stained smear revealed small Gram-negative diplococci. The bacterial isolate was strongly oxidase positive. The identification of the isolate by MALDI-TOF MS was performed, and the isolate was finally identified as *N. gonorrhoeae*. The β-lactamase test was also performed and was found to be negative, suggesting that this isolate did not produce the enzyme β-lactamase. At follow-up, remarkable improvement of her symptoms was evident, with visual acuity improved to counting fingers at 3 feet (from light perception only). Retinitis resolved completely.

Endophthalmitis may be divided into surgical and medical causes [5]. Surgical endophthalmitis occurs after ocular procedures (particularly cataract surgery), injections or trauma. Surgical endophthalmitis is commonly caused by coagulase-negative *Staphylococcus* [6]. Medical endophthalmitis is typically associated with positive blood culture, sepsis and injection drug use. Common pathogens causing medical endophthalmitis include *Staphylococcus aureus*, *Candida* spp. and *Klebsiella* spp. [7]. In this case, the patient was diagnosed with endophthalmitis resulting from gonococcal keratoconjunctivitis.

Neisseria is a rare cause of endophthalmitis; most cases are caused by *Neisseria meningitidis* associated with meningitis. We found only three case reports of *N. gonorrhoeae* causing endophthalmitis. Our patient had no history of high-risk sexual behavior, such as having multiple sex partners or engaging in risky sexual practices. Pharyngeal, cervical and anal/rectal samples from the patient were not collected, so other sites or sources of gonococcal carriage or infection remain unknown. The patient also denied any previous sexually transmitted infections; she had never been tested for other sexually transmitted infections such as *Chlamydia trachomatis* infection or syphilis. It is unknown whether her husband has been tested for sexually transmitted infections, in particular for gonococcal infection. In addition, no outbreak was reported during the period surrounding the patient's hospitalization.

Endophthalmitis commonly causes severe or irreversible vision loss, which may occur within hours to days. Prompt diagnosis and aggressive treatment are necessary to preserve vision [7]. Our patient had a better outcome, possibly as a result of immediate aggressive management, especially the provision of therapy with a large-spectrum fourth-generation cephalosporin. Also, she had predominantly anterior chamber involvement, which is associated with better outcome.

Our description of this rare case of endophthalmitis resulting from *N. gonorrhoeae* indicates that prompt recognition and treatment of gonococcal conjunctivitis and endophthalmitis are critical and will ultimately result in a better prognosis.

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Conflict of interest

None declared.

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