Conjunctivitis due to *Neisseria sicca*: A case report

Ilker Eser, Alper Akcali¹, Muserref Tatman-Otkun¹, Arzu Taskiran-Comez²

We report the first case, in Medline-based literature, of conjunctivitis caused by gram negative diplococcus, *Neisseria sicca*. Although it is not widely accepted as such, isolation from cultures of repeated eye swab samples suggests that *N. sicca* may be a pathogen in conjunctival infections. Positive culture for this organism should not be readily dismissed. Such conjunctivitis responded favorably to treatment with netilmicin eye drops.

Key words: Bacterial conjunctivitis, conjunctivitis, gram negative diplococcus, *Neisseria sicca*, netilmicin

Acute conjunctivitis accounts for approximately 1% of all conditions treated in primary eye care. *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Haemophilus influenzae*, *Streptococcus pneumoniae*, *Viridans streptococci* and *Moraxella catarrhalis* are the most common pathogens isolated from acute bacterial conjunctivitis cases. *Neisseria gonorrhoeae* is the most common cause of hyperacute bacterial conjunctivitis. Other bacterial pathogens are rarely reported.[3]

A variety of nonpathogenic neisseriae are common commensals of the upper respiratory tract and are rarely implicated as pathogens in eyes.[2] We report the first case, in Medline-based literature, of conjunctivitis caused by a gram negative diplococcus, *Neisseria sicca*. Although it is not widely accepted as such,[3] isolation from cultures of repeated eye swab samples suggests that *N. sicca* may be a pathogen for conjunctival infections. This report will aid clinicians to diagnose and treat such a rare occurrence. The organism was repeatedly grown in culture and case were treated successfully with netilmicin.

**Case Report**

A 79-year-old woman presented with complaints of redness and purulent discharge in the left eye for the previous 2 days. She had no history of trauma or surgery. On slit-lamp examination, a mucopurulent discharge and severe crusting of the eye were noted. Samples were taken from the inferior fornix for microbiological examination using two separate conjunctival swabs. The cultures were then inoculated onto blood and chocolate agar, incubated at 36°C for 48 hours and evaluated with a *Neisseria-Haemophilus* identification (NH) card on a Vitek2 compact system (bioMerieux, Marcy, l’Etoile, France).

The patient was empirically put on fucidic acid (Fucithalmic gel 1%) therapy four times daily, but did not respond to this treatment. On the third day, treatment was changed to ofloxacin (Exocin 0.3%, Allergan) four times daily with fluorometholon.

Acibadem Maslak Hospital, Eye Clinic, Istanbul, Departments of ¹Microbiology and Clinical Microbiology, School of Medicine, and ²Ophthalmology, University of Canakkale Onsekiz Mart, Canakkale, Turkey

Correspondence to: Assoc Prof. Ilker Eser, Acibadem Maslak Hospital, Eye Clinic, Istanbul, Turkey. Email: ilkereser@yahoo.com

Manuscript received: 11.03.10; Revision accepted: 03.09.10
(Efemoline 1%, Novartis) four times daily added in spite of the fact that usage of corticosteroids is controversial as it may contribute to progression of the infection by inhibiting the immune response. Then, a second sample was taken. In the first sample, gram stain revealed large numbers of polymorphonuclear leukocytes and gram variable diplococci [Fig. 1]. On sheep blood agar and chocolate agar plates, small, pale colonies grew [Fig. 2]. The same organism grew in the culture of the sample taken at the second visit. The isolated organism was gram negative diplococci. The identification of the organism was accomplished by standard biochemical tests and with a NH card on Vitek2 compact system. The organism was oxidase positive, DNase negative, catalase positive, nitrate reduction positive and produced acid from glucose, fructose, maltose, and sucrose. Using the Vitek2 system, the organism was identified as \textit{N. sicca} with a bionumber of 0632400000 and 98% probability. There are no accepted criteria for evaluation of the antimicrobial susceptibility of this organism according to the Clinical and Laboratory Standards Institute (CLSI). Furthermore, \textit{in vitro} susceptibility testing of the isolated bacteria cannot always guide the therapy of conjunctival infections, while susceptibility interpretations of minimum inhibitory concentration (MIC) values are based on serum concentrations. MIC values of ceftriaxone (0.125 µg/ml), benzylpenicillin (2 µg/ml), tetracycline (1 µg/ml) and netilmicin (1 µg/ml) were determined using Etest (AB BIODISK, Solna, Sweden) on Muller Hinton agar with 5% sheep blood agar. As the patient did not respond to the previous treatments and slit-lamp examination findings remained the same, she was given netilmicin (Netira® SIFI, SpA, Catania, Italy) drops four times daily. Three days later, there was no evidence for conjunctivitis and the patient’s complaint resolved.

**Discussion**

Any organism cultured from conjunctival samples needs to be interpreted within the context of the clinical case and other supportive laboratory evidence. If clinical suspicion is high and many polymorphonuclear leukocytes and organisms are seen in gram stains of samples, even unusual or environmentally isolated organisms should be reported to avoid false-negative reporting. The isolated microorganism, \textit{N. sicca}, did not respond to wide spectrum antibiotics such as fucidic acid and ofloxacin, but responded to netilmicin. This fact implies that netilmicin may be used empirically in future conjunctival infections caused by this organism.

As the patient was not known to be immunocompromised or diabetic, and had no history of using any eye drops on a chronic basis which might change the conjunctival flora, \textit{N. sicca} was considered as the causative agent for her conjunctivitis. Although there was no history of trauma mentioned, as she was a farm worker she might have been unaware of a minor trauma which might have caused unilateral conjunctivitis. One conjecture for the source of the bacteria might be the oropharyngeal flora as some \textit{Neisseria} species are found in the oropharynx. Following a Medline search incorporating keywords \textit{Neisseria sicca} and conjunctivitis, to the best of our knowledge, conjunctivitis caused by this organism has not been previously reported. \textit{N. sicca} has been implicated in cases of meningitis, pneumonia, endocarditis, peritonitis and urethritis.

When microbiological examination is considered in conjunctivitis cases, the best practice is to obtain two swab samples from each eye. One swab can be used for gram stain and the other for culture procedures. This procedure helps the laboratory to define the causative organism and consider the pathogenicity of the isolated bacteria. This case confirmed the potential pathogenicity of \textit{N. sicca} in conjunctiva and emphasizes that positive cultures for this organism should not be readily dismissed; netilmicin proved an effective treatment in such cases.

**References**

1. Hovding G. Acute bacterial conjunctivitis. Acta Ophthalmol 2008;86:5-17.
2. Vaughan AT, Gorringe A, Davenport V, Williams NA, Heyderman RS. Absence of mucosal immunity in the human upper respiratory tract to the commensal bacteria Neisseria lactamica but not pathogenic Neisseria meningitidis during the peak age of nasopharyngeal carriage. J Immunol 2009;182:2231-40.
3. Bourbeau P, Holla V, Piemontese S. Ophthalmia neonatorum caused by Neisseria cinerea. J Clin Microbiol 1990;28:1640-1.
4. Seal D, Pleyer U. Ocular Infection. 2nd ed. New York, NYInforma Healthcare 2007. p. 145.
5. Clinical and Laboratory Standards Institute. Performance Standards for Antimicrobial Susceptibility Testing; Nineteenth Informational Supplement. 2008.
6. Bansmer C, Brem J. Acute meningitis caused by Neisseria sicca. N Engl J Med 1948;238:596-7.
7. Alcid DV. Neisseria sicca pneumonia. Chest 1980;77:123-4.
8. Gay RM, Sevier RE. Neisseria sicca endocarditis: Report of a case and review of the literature. J Clin Microbiol 1978;8:729-32.
9. Wilkinson AE. Occurrence of neisseria other than gonococcus in the genital tract. Br J Vener Dis 1965;28:24-7.
10. D’Angelo A, Sleiman J, Mongia A, Schoeneman M, Hammerschlag M. Peritonitis caused by Neisseria sicca in a child on chronic peritoneal dialysis. Dial Transplant 2007;36:457-9.

Cite this article as: Eser I, Akcalli A, Tatman-Ölкun M, Taskiran-Comez A. Conjunctivitis due to Neisseria sicca: A case report. Indian J Ophthalmol 2014;62:350-2.

Source of Support: Nil. Conflict of Interest: None declared.