

Primary Meningococcal-C Conjunctivitis in a Vaccinated Child

Breton-Martinez JR^{*} and Hernandez R

Department of Pediatrics, Hospital Universitario Dr. Peset. Av. Gaspar Aguilar, Valencia, Spain

^{*}Corresponding author: Breton-Martinez JR, Department of Pediatrics, Hospital Universitario Dr. Peset. Av. Gaspar Aguilar, Valencia, Spain, Tel: +34961622300; E-mail: jbretonmar@gmail.com

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Abstract

Meningococcal conjunctivitis is classified into primary (direct inoculation of the bacteria into the palpebral conjunctiva from an exogenous source) and secondary (as an unusual complication of systemic meningococcal disease). Primary meningococcal conjunctivitis (PMC) is an uncommon cause of bacterial conjunctivitis. It is important to establish an early diagnosis in view of the potential for invasive meningococcal disease. Vaccination with meningococcal serogroup C conjugate (MCC) vaccines reduces the carriage of serogroup C meningococci and protects against invasive infection. We report a case of a meningococcal C conjunctivitis in a vaccinated child.

Case report

A Spanish healthy 4-year-old boy properly vaccinated (with a 3-dose schedule of meningococcal C conjugate vaccine at ages 2, 4, and 6 months) came to the Emergency Room with marked bilateral eyelid edema, severe purulent discharge, moderate pain and a temperature of 38.5°C. The conjunctiva was red and edematous. His general condition was good, with no rash nor meningeal signs. He was diagnosed with bacterial conjunctivitis and upper respiratory tract infection. Conjunctival swabs for culture were obtained and the patient was started on tobramycin drops. After 48 hours of incubation conjunctival swabs grew *Neisseria meningitidis* serogroup C sensitive to penicillin (MIC 0.032 mg/l), chloramphenicol and co-trimoxazole. The patient was called back for further assessment and the results of physical examination were normal. Eye secretions and inflammation had disappeared by the third day of topical treatment, so parenteral therapy was not given. Tobramycin drops were continued for 10 days more. Meningococcal prophylaxis with rifampicin was given to him and his household contacts. Our patient had neither local complications nor systemic meningococcal disease.

Discussion

In PMC the mode of transmission is thought to be direct inoculation of the organisms in the conjunctival sac from an exogenous source either through airborne microorganisms or manual contact. It may be transmitted to the conjunctivae from the own nasopharynx of an asymptomatic meningococcal carrier by hands contaminated by oral secretions.

N. meningitidis accounts for 0.08-2% of bacterial conjunctivitis [1,2]. It has been reported mainly in children under the age of five years [3] with 95% patients being less than 25 years of age. PMC usually presents with an acute or hyperacute purulent conjunctivitis with gross exudate, but signs may be unspecified and indistinguishable from conjunctivitis caused by other organisms. Fever may be a sign of invasive illness but has been described in PMC patients without clinical or microbiological evidence of systemic meningococcal disease [4]. In two-thirds of cases reported the infection is unilateral [2].

Local ocular complications such as keratitis, subconjunctival hemorrhage and iritis have been reported in 15.5% patients. If left untreated this condition may progress to involve the cornea with peripheral ulceration, abscess formation and perforation [5].

Moraga et al. [1] reported that 41.7% of patients treated with topical therapy alone contracted invasive meningococcal disease and none of those treated with systemic therapy. Although good outcome has been reported in some cases with only topical treatment [2-4], it should include the administration of systemic antibiotics in order to prevent invasive disease [1,2] which has a mortality rate of 10-15%. Our patient was vaccinated with MCC vaccine, but the causative microorganism could have been meningococcus B that is also endemic in Spain [2] and MCC vaccine failures have been observed [6].

This case reinforces the need for Gram stain of the exudate and bacteriological identification in cases of severe bacterial conjunctivitis with pronounced conjunctival redness and copious purulent discharge, with the aim of diagnosing cases such as this one. Barquet et al. [2] found that Gram stain of conjunctival exudate revealed gram-negative diplococci in all cases of PMC in which it was performed. Empiric therapy should be instituted immediately in cases of hyperacute conjunctivitis with gram-negative diplococci. However, one should be aware that other pathogenic species such as *Moraxella catarrhalis* and other *Neisseriaceae* may be morphologically indistinguishable from *N. meningitidis*.

MCC vaccines generate serogroup C-specific bactericidal IgG antibodies with high avidity and immunological memory [7]. MCC vaccines also induce mucosal immunity to inhibit carriage of meningococci serogroup C, although protective effectiveness against carriage one year after vaccination is about 63% [8] to 66% [9]. This fact may explain the local conjunctival infection in our case and a potential protective effect of the vaccine against invasive infection.

Transmission of meningococcal PMC from the index case to household members and development of invasive disease has been reported, with sometimes fatal outcomes. Chemoprophylaxis should be administered for household members, close contacts and the index case [7] (if the patient has not been treated with cefotaxime or ceftriaxone). Development of secondary disease also can be prevented

by immunization of contacts. So it may be advisable administering both immunization and chemoprophylaxis if the conjunctivitis is caused by a serogroup included in the available vaccines.

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