Ophthalmia Neonatorum Caused by *Neisseria cinerea*

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*Neisseria cinerea* is an organism that has only recently been implicated as a human pathogen. In this case, *N. cinerea* was identified as the cause of ophthalmia neonatorum (conjunctivitis) in a 2-day-old girl.

*Neisseria cinerea*, although first recognized in Europe in 1906, was not described in the United States until 1984 (8). Only limited information exists on either the frequency of commensal colonization or the potential pathogenicity of this organism. In the only published study, the oropharyngeal colonization rates for *N. cinerea* were found to be 30% of 83 women, 24% of 92 heterosexual men, and 37% of 27 homosexual men (7). In this same group of individuals, *N. cinerea* was isolated from the urethra of only one heterosexual man.

Even though *N. cinerea* apparently frequently colonizes the upper respiratory tract, this organism has only rarely been implicated as a cause of disease. Single case reports of lymphadenitis in an immunosuppressed youth (3), proctitis in an 8-year-old boy (5), and conjunctivitis in a newborn (9) have been published.

In this report, we present a case report of an infant with ophthalmia neonatorum (conjunctivitis) caused by *N. cinerea*.

**Case report.** A 26-year-old woman in her first pregnancy gave birth to a full-term girl (weight, 3,841 g) with normal labor and delivery. The baby received erythromycin ointment eye prophylaxis at birth. The mother, who gave no history of any venereal disease, vaginal discharge, or genital herpes, had regular obstetrical visits during the pregnancy.

Two days after birth, the baby was noted to have a left-eye discharge. A specimen of the discharge was obtained for bacterial culture, and treatment was begun with tobramycin ointment and amoxicillin orally, 50 mg three times daily. In all other respects, the baby had been progressing normally.

The following day, the microbiology laboratory reported that oxidase-positive, gram-negative diploccoci were growing on the eye discharge culture on both chocolate and modified Thayer-Martin agars. The baby was then transferred to the neonatal intensive care unit (NICU) for treatment of suspected gonococcal ophthalmitis. On admission to the NICU, a complete septic workup was ordered, including bacterial cultures of samples of discharges from both eyes, blood, and cerebrospinal fluid as well as a direct fluorescent-antibody test for *Chlamydia trachomatis*. Antibiotic therapy was changed to erythromycin ointments every 4 h and crystalline penicillin G, 100,000 U/kg per day divided over three doses. An ophthalmology consult was performed, and the cornea of the left eye was noted to be normal with no keratitis. Following 7 days of intravenous penicillin G therapy, the baby was discharged from the hospital without further complications. Erythromycin eye ointment was prescribed for an additional 5 days.

When the culture results were discussed with the baby's parents, the father admitted to having had sexual intercourse with another female sexual partner(s), in addition to the mother, during the pregnancy. The mother claimed to have had sexual intercourse only with the father during this same period. At no time during the episode were samples for culture obtained from either the mother or the father.

**Laboratory results.** A sample for culture from the left eye, which was obtained before initiation of antibiotic therapy, yielded an oxidase-positive, gram-negative diplococcus which grew well on both chocolate and modified Thayer-Martin agars (BBL Microbiology Systems, Cockeysville, Md.). The isolate was subcultured onto chocolate agar for additional tests. The results for this isolate were as follows: negative glucose, lactose, maltose, and sucrose rapid carbohydrate degradation tests (Remel); negative DNase and β-lactamase (Quad Ferm+; Analytab Products); and negative *Neisseria gonorrhoeae* monoclonal fluorescent antibody (Syva Co.). Based on these results, the isolate was reported as a *Neisseria* species but not *N. gonorrhoeae* and sent to the Centers for Disease Control (CDC; Atlanta, Ga.) for definitive identification. In identifying the isolate as *N. cinerea*, the CDC confirmed the results of the biochemical tests performed in our laboratory and provided the following additional test results: negative nitrate, amyladosucrose, and starch hydrolysis; no growth on Thayer-Martin agar (VCN), Loeffler agar, and nutrient agar at 25°C; positive nitrite; starch accumulation (slight); and growth on nutrient agar at 35°C.

Cultures of samples of blood, cerebrospinal fluid, and discharges from both eyes obtained at the time of admission to the NICU were all negative. A direct fluorescent-antibody test (Syva Co.) for *C. trachomatis* on a left-eye specimen was also negative. The complete blood count gave a leukocyte count of 12,300 with 52 segmented neutrophils and 4 bands. A rapid plasma reagin test was nonreactive.

**Discussion.** *N. cinerea* normally colonizes the upper respiratory tract of humans (7). This organism, however, has only rarely been implicated as a true cause of disease, being associated with single case reports of lymphadenitis (3), proctitis (5), and conjunctivitis (8).

The clinical and laboratory findings in the patient described here clearly establish *N. cinerea* as the cause of ophthalmia neonatorum. Symptoms for gonococcal conjunc-

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tivitis usually begin on days 3 to 5 of life, whereas with chlamydia, conjunctivitis symptoms develop 1 to 2 weeks after birth (6). In the patient described here, the incubation period of *N. cinerea* was similar to that of *N. gonorrhoeae*, and in fact, the initial clinical diagnosis was gonococcal ophthalmitis.

This isolate of *N. cinerea* in a discharge sample from the eye of the patient grew in pure culture on both chocolate and modified Thayer-Martin agars. Although our laboratory did not attempt to subculture the isolate to a gonococcal selective medium, the CDC reported that the isolate did not grow on subculture onto Thayer-Martin agar (VCN). This inability to grow on subculture to a gonococcal selective medium should suggest to the microbiologist the possibility that an isolate such as the one described here is one of the usually commensal *Neisseria* species.

The fact that *N. cinerea* is not identified more frequently as a cause of ophthalmitis may be due to the apparent infrequency with which genital colonization occurs. In one study of 82 women, although 30% had oropharyngeal colonization with *N. cinerea*, none had vaginal colonization with this same organism.

There is at least a suggestion that in the patient described here, the organism may have been sexually transmitted to the mother. The father of the baby admitted to having had at least one other sexual partner, in addition to the mother, during the pregnancy. Because samples from neither the father nor the mother were obtained for culture, this cannot be substantiated. It is reasonable to assume, however, that the baby’s eye was colonized during passage through the mother’s birth canal.

Perhaps in part because of the infrequency with which *N. cinerea* is isolated in the clinical laboratory, care must be taken not to identify this organism as *N. gonorrhoeae* (1, 2, 4, 5). Laboratory technicians must be familiar with the limitations of the various rapid identification kits used to identify *Neisseria* species, especially when these isolates are cultured from nongenital sites. Misidentification becomes a real possibility with isolates which grow well on selective *Neisseria* medium, such as the isolate from this patient, particularly when subcultures to gonococcal selective medium are not performed.

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**LITERATURE CITED**


