

ENDOPHTHALMITIS IN A YOUNG CHILD WITH MENINGOCOCCAL MENINGITIS*

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Meningococcal meningitis is still a serious infection with high rates of morbidity and mortality. It is associated with severe complications. In recent years ocular complications have occurred less frequently, and endophthalmitis has been recognized as a rare complication. We present a case of meningococcal meningitis complicated by endophthalmitis. *Key words:* endophthalmitis, *Neisseria meningitidis*, meningococcal meningitis.

Meningococcal infections remain an important cause of morbidity and mortality in children and adults. Although the incidence of meningococcal infections and complications has decreased markedly with newer chemotherapeutic agents, early diagnosis and therapy are necessary to prevent complications and death. In recent years ocular complications have occurred less frequently, and endophthalmitis has been recognized as an unusual complication of meningococcal meningitis. Here, we report a case with meningococcal meningitis as well as endophthalmitis.

Case Report

A two-year-old girl had been well until ten days before admission to Ondokuz Mayıs University Children's Hospital. The child had fever and weakness for ten days and widespread rash for four days. Her parents noted an opacity in her left eye before admission. The child was observed to be severely ill, irritable and disoriented. Axillary temperature was 39.2 °C, pulse rate 148/min, respiration rate 40/min and blood pressure 90/60 mmHg. There were multiple petechial and purpuric lesions over her forearms, chest and especially thighs. She had a stiff neck in addition to positive Kernig's and Brudzinski's signs. On ophthalmologic examination, the right eye was normal but the anterior chamber of the left eye was found to be hazy with pus-like material in the inferior area (Fig. 1). The left orbital region was red and swollen. Slit-lamp examination revealed a hypopyon 2 mm in thickness. Orbital computerized tomography scan and ultrasonography were normal as were the other systemic findings.

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Fig. 1: Two millimeters' thickness hypopyon on the anterior chamber of the left eye of the patient with meningococcic meningitis is seen.

Laboratory studies showed a hemoglobin of 8.8 g/dl, white blood cell (WBC) count of $12,400/\text{mm}^3$ with 66% polymorphonuclear leukocytes, 28% and 6% band forms. Erythrocyte sedimentation rate was 120 mm/h, while routine urinalysis and other biochemical results were normal. Lumbar puncture was performed immediately. Cerebrospinal fluid was turbid with $14,200 \text{ WBCs}/\text{mm}^3$, a protein level of 320 mg/dl and glucose level of 10 mg/dl. Latex agglutination test was positive for *Neisseria meningitidis* group C, and Gram staining smear revealed Gram (-) diplococci. Cerebrospinal fluid culture confirmed *Neisseria meningitidis*. No growth was noted in the blood cultures.

Therapy was started with intravenously administered ceftriaxone 100 mg/kg/day and dexamethasone 0.5 mg/kg/day. The hypopyon in the left eye was treated with topically applied ophthalmic gentamycin 0.3% 4 x 1 gtt, cefazoline 3.3% 4 x 1 gtt and atropine 1% 4 x 1 gtt sulfate. Appropriate supportive care was instituted. The patient became afebrile within three days; the hypopyon started to clear five days after the initiation of therapy and disappeared by the seventh day of treatment. Ceftriaxone therapy was continued for seven days, and other topical antibiotics and atropine sulfate were discontinued after 18 days. After being discharged from the hospital, the child was examined ophthalmologically every two weeks, and her eyes were found to be normal, including visual acuity, over a ten-month period.

Discussion

Meningococcal infections are still important causes of morbidity and mortality in all age groups¹. Although *N.meningitidis* can be found in the birth canal and attacks the eyes of the neonate, endogenous meningococcal disease has been the most common form of endophthalmitis²⁻⁴. Endophthalmitis has been reported in about five percent of cases with meningococcal meningitis. Staphylococci, Streptococci, *Bacillus* species, gram-negative enteric bacilli, *Pseudomonas* and *Haemophilus influenza* type b are the other microorganisms which have caused endophthalmitis⁵.

Ocular infections of the meningococci have been classified into three groups: 1) those occurring without meningitis; 2) those occurring during or after an attack of meningitis; and 3) meningitis following ocular infection⁶. Our case probably had ocular infection after meningitis. She came to the hospital with both orbital and meningeal involvement.

The incidence of ocular complications of meningococcal infections in the USA has ranged from 0.5 to 5.7 percent of cases⁷. About one-third of these have bilateral ocular involvement. Our case had unilateral endophthalmitis. Koch and Carson⁴ reported three cases of uveitis in 128 children with meningococcal infections. In addition to uveitis, conjunctivitis⁶, episcleritis⁸ and cataracts⁹ may also be seen as a result of meningococcal infection.

The only way to determine the cause of bacterial endophthalmitis is by aspirating intraocular fluids and recovering organism from cultures. The experience of the past ten years has demonstrated that in metastatic endophthalmitis, positive cultures from other sites in the body are very reliable indicators of the causative organism¹⁰. Thus, we did not take any ocular fluid for culture from the patient. Greenwald et al.¹⁰ reported that the same microorganisms had been isolated from ocular fluids and other infected sites of the body in 16 of the 72 cases they reviewed. It has been postulated that in endogenous endophthalmitis as a result of hematogenous spread of infection, there may be a disruption of the blood-ocular barrier, similar to disruption of the blood-brain barrier in meningitis. Thus, systemic antibiotics are effective for both meningitis and endophthalmitis. Only in cases of severe endogenous endophthalmitis which involve most of the posterior chamber or progress to panophthalmitis, intravitreal antibiotics must be used¹⁰. Our case was treated with systemic antibiotics, dexamethasone and local drugs for the eye. The anti-inflammatory activity of the corticosteroids may be important in preventing cicatricial complications secondary to endophthalmitis⁷.

The prognosis of meningococcal endophthalmitis is generally good. However, delay in appropriate diagnosis and antibiotic therapy may contribute to poor prognosis¹⁰. We suggest that ocular involvement be sought in every case with meningococcal meningitis.

REFERENCES

1. Wong VK, Hitchcock W, Mason WH. Meningococcal infections in children: a review of 100 cases. *Pediatr Infect Dis J* 1989; 8: 224-227.
2. Ellis M, Weindling AM, Davidson DC, Ho N, Damjanovic V. Neonatal meningococcal conjunctivitis associated with meningococcal meningitis. *Arch Dis Child* 1992; 67: 1219-1220.
3. Lewis PM. Ocular complications of meningococcal meningitis; observations in 350 cases. *Am J Ophthalmol* 1940; 23: 617-632.
4. Koch R, Carson MJ. Meningococcal infections in children. *N Engl J Med* 1958; 258: 639-643.
5. Auerbach SB, Leach CT, Bateman BJ, et al. Meningococcal endophthalmitis without concomitant septicemia or meningitis. *Pediatr Infect Dis J* 1989; 8: 411-413.
6. Shuttleworth FN, Benstead JG. Primary meningococcal ophthalmia. *Br Med J* 1947; 2: 568-569.
7. Jensen AD, Naidoff MA. Bilateral meningococcal endophthalmitis. *Arch Ophthalmol* 1973; 90: 396-398.
8. Whittle HC, Abdullahi MT, Fakunle FA, et al. Allergic complications of the meningococcal diseases; I-Clinical aspects. *Br Med J* 1973; 2: 733-737.
9. Hanna LS, Girgis NI, Farid Z, Yassin H. Transient cataracts in a young child with meningococcal meningitis. *Pediatr Infect Dis J* 1989; 8: 802-803.
10. Greenwald MJ, Wohl LG, Sell CH. Metastatic bacterial endophthalmitis: a contemporary reappraisal. *Surv Ophthalmol* 1986; 31: 81-101.