

Annotation

Chlamydial infections in paediatrics

Diseases caused by *Chlamydia trachomatis* are diverse, ranging from trachoma, the commonest infectious cause of blindness, to many cases of non-gonococcal urethritis (NGU). Recently, there has been a greater appreciation of the role of *C. trachomatis* in other diseases, for example salpingitis, epididymitis, and particularly in paediatric infections. The association of *C. trachomatis* with non-gonococcal ophthalmia has been known for nearly 70 years. In 1884, Kroner¹ postulated that abacterial ophthalmia neonatorum was due to an unknown agent acquired at birth from the genital tract of the mother. By 1911, only 4 years after the first description of an aetiological agent for trachoma, the early pioneers had established a firm link between trachoma, NGU, and abacterial ophthalmia neonatorum (inclusion blennorrhoea). Lindner² had postulated that inclusion blennorrhoea was usually due to the trachoma agent. Detailed studies on the role of *C. trachomatis* in neonatal eye disease awaited the development of techniques for the isolation of the organism. The first successful isolation of *C. trachomatis* by Tang *et al.*³ using the yolk sac of embryonated eggs was soon followed by the isolation of chlamydiae from the eyes of a baby with inclusion blennorrhoea, and from the cervix of its mother.⁴ The development of simple cell culture techniques, such as the use of 5-iodo-2-deoxyuridine-treated McCoy cells⁵ led to wider investigations into the incidence of chlamydial disease in genitourinary medicine and paediatrics.

The eye diseases caused by *C. trachomatis* provide a spectrum from the severe blinding hyperendemic trachoma, through punctate keratoconjunctivitis to the less severe paratrachoma of western countries. Serotypes of *C. trachomatis* tend to be associated specifically with endemic trachoma on the one hand, and with paratrachoma and the genitourinary complex on the other. There is however considerable overlap between the disease manifestations caused by the different serotypes, indicating that other factors are involved in pathogenicity, such as local hygiene standards, exposure to recurrent infection with *C. trachomatis*, and secondary bacterial infection. Watson and Gairdner⁶ reported a follow-up study on 3 babies with probable chlamydial ophthalmia: 2 developed some conjunctival scarring, and one of

these developed pannus. A study of 16 babies by Mordhorst and Dawson⁷ yielded evidence of pannus in 7 children. They commented that these changes were not seen in babies treated with topical tetracycline. More recently, Rees *et al.*⁸ reported on 103 cases of ophthalmia neonatorum. Thirty-three yielded *C. trachomatis*, and 11 *Neisseria gonorrhoeae*. 3 babies yielded both infectious agents.

Chlamydial ophthalmia is acquired during birth through an infected cervix. The disease is usually manifest between the 4th and 10th day of life, and may vary from a severe exudative ophthalmitis clinically indistinguishable from gonococcal ophthalmia, to little more than a 'sticky' eye. In general, the disease is self-limiting over a period of 2-3 months, but progression to pannus and scarring can occur. Specific therapy is available. From *in vitro* studies on the antibiotic sensitivity of *C. trachomatis*⁹ it is known that the aminoglycosides have no effect on chlamydiae, while chloramphenicol has a partial effect. This is reflected clinically by modification of the course of the disease, without cure, when chloramphenicol topical therapy is used. Tetracyclines and erythromycin are effective both *in vitro* and clinically. The approach to the therapy of ophthalmia neonatorum should therefore be the initial exclusion of the gonococcus, followed by local therapy with neomycin ointment. If the eyes do not respond, then the possibility of a chlamydial aetiology should be considered, and the therapy changed to local 1% chlortetracycline cream, and systemic erythromycin (30 mg/kg). Both antibiotics are required as failures may occur with local therapy alone. Treatment should be continued for 21 days, and both parents should be investigated and treated. It is noteworthy that silver nitrate prophylaxis is well documented as being ineffective against *C. trachomatis*.

Recent evidence has suggested that chlamydial infection in children is not restricted to ophthalmia. Schachter *et al.*¹⁰ described a child born to a mother with a known chlamydial infection of the cervix. The child developed unilateral inclusion blennorrhoea, which responded poorly to topical sulfacetamide. The eye resolved subsequently with topical tetracycline therapy, but at the age of 7 weeks the child developed pneumonitis. The sputum contained large

numbers of chlamydiae, while scrapings from the conjunctiva at that time were negative for *C. trachomatis*. This single case report was followed by the preliminary description of a distinctive pneumonia syndrome in infants by Beem and Saxon.¹¹ The onset of the disease was from about the sixth week of life, characterised by little systemic reaction, but staccato cough. Radiology of the chest showed diffuse pneumonia. Cultures from the nasopharynx yielded *C. trachomatis*, and high serum immunofluorescent antibody titres were found. Many of these children had no clinical or cultural evidence of conjunctivitis. Chlamydiae have been isolated from open lung biopsy from a case of pneumonitis by Frommel *et al.*,¹² but the child also had demonstrable cytomegalovirus infection. Cytomegalovirus was also isolated from 4 of the 20 cases described by Beem and Saxon. The extension of these findings, with results from other centres, are awaited with interest.

The association of *C. trachomatis* with other paediatric conditions is less well defined. Wilt *et al.*¹³ detected complement-fixing antibodies in 50% of 24 placental fluids examined, but did not correlate this finding with perinatal disease. A possible relationship between maternal chlamydial infection and prematurity was demonstrated by Rees *et al.*,¹⁴ when 41.4% of the babies with *C. trachomatis* ophthalmia were premature. 2 of these babies had ventricular septal defects. In addition, one baby born to a *Chlamydia*-positive mother died of cardiac failure at 3 days, with post-mortem evidence of congenital heart disease. There is circumstantial evidence that chlamydiae may be associated with vaginitis in infants and with otitis media.¹⁵

It is apparent that many more diseases are being identified as having a possible chlamydial aetiology. Identification of NGU in the male is not difficult, but few centres attempt to trace female partners with the same enthusiasm found with gonococcal urethritis. Yet the possible effects of unrecognised cervical infection in the mother on the neonate indicate a definite need to identify and treat *C. trachomatis* infection of the cervix as a useful piece of preventative medicine.

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