Perspective

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Chlamydial and Gonococcal Infections in Infants and Children

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Although sexually transmitted illnesses such as *Chlamydia Trachomatis* and *Neisseria Gonorrhoea* are more commonly associated with sexually active adults and adolescents, infection can also occur in newborns and children. These illnesses can be transmitted to infants by pregnant mothers during delivery, although infection in older children is mainly acquired through sexual assault. The high incidence of perinatal *C. trachomatis* and gonococcal infections opens up a number of options for treatment. For more than a century, the United States has used neonatal ocular prophylaxis to avoid gonococcal ophthalmianeonatorum. Prenatal screening and treatment of pregnant women, which has been shown to be helpful in reducing neonatal gonococcal ophthalmia, looks to be an effective technique for preventing neonatal chlamydial infection as well.

Chlamydial genital infection has been documented in 5%-30% of pregnant women, with a 50% risk of vertical transmission to new born off-spring during parturition. The conjunctivae, nasopharynx, rectum, and vagina may all develop infected in the infant. Following a caesarean delivery with intact membranes, transmission is uncommon. Clinical conjunctivitis affects 30%-50% of new born to moms with active, untreated chlamydial infection. Nasopharyngeal infection affects at least 50% of babies with chlamydial conjunctivitis. Pneumonia caused by *C. trachomatis* affects 10%-20% of infants born to moms who have an active, untreated chlamydial infection. Only approximately a quarter of babies with nasopharyngeal chlamydial infection have pneumonia. Infections of the rectal and vaginal canals are asymptomatic. The presence of chlamydial infection in an older child being assessed for suspected sexual abuse could be a problem. *C. trachomatis* was probably the most common infectious cause of new born conjunctivitis in the United States until the introduction of prenatal screening for *C. trachomatis* infection and treatment of pregnant women. In the early 1980s, the Centers for Disease Control (CDC) and Prevention first suggested *C. trachomatis* screening and treatment. The introduction of nonculture methods for *C. trachomatis* detection, as well as the advice in 1993 to treat pregnant women with single-dose oral azithromycin, considerably improved the execution of these recommendations. The frequency of new born conjunctivitis and pneumonia has reduced considerably since the broad implementation of screening and therapy. *C. trachomatis* is still a major cause of new born conjunctivitis in countries where prenatal screening is not done. *C. trachomatis* was shown to be responsible for 61% of instances of new born conjunctivitis in infants presenting to a paediatric hospital and ophthalmologists in Rotterdam. In that group, *C. trachomatis* infection is found in 4% of pregnant women; nevertheless, prenatal screening and treatment are not standard practise in the Netherlands. In Ireland, 17 instances of new born conjunctivitis owing to *C. trachomatis* and 1 case related to *N. gonorrhoea* were found in neonates presenting to a major regional teaching hospital between July 2002 and December 2006.The rate of chlamydial ophthalmia was 0.65 per 1000 live births, and it was shown to be increasing year after year, matching the region's overall increase in genital chlamydial infection. In Ireland, prenatal testing and treatment for *C. trachomatis* and *N. gonorrhoea* is not common. Prenatal screening and treatment are not routine practise in Hong Kong, as they are in the Netherlands.

Because there have been no new studies in a decade, the recommendations for the care of chlamydial and gonococcal infections in babies have remained mostly constant since the last edition of the CDC treatment guidelines. In new borns, culture is still the best way to diagnose *C. trachomatis* and *N. gonorrhoea* infections. In many laboratories, Nucleic Acid Amplification Tests (NAATs) for the detection of *C. trachomatis* and *N. gonorrhoea* have replaced culture. However, none of the currently available NAATs has been approved for use in conjunctival or nasopharyngeal tissues from new borns by the Food and Drug Administration (FDA). Polymerase Chain Reaction (PCR) worked very well compared to culture for detection of *C. trachomatis* in conjunctival specimens from babies with conjunctivitis, according to results from two studies published in 1997 and 2008. Infants

with *C. trachomatis* conjunctivitis usually have a large number of organisms present, and obtaining a suitable specimen is simple. Many of the older antigen detection methods, such as Direct Fluorescent Antibody (DFA) staining and enzyme immunoassay, performed well with conjunctival material, with sensitivities and specificities of 97%-98%. The performance of nasopharyngeal specimens was less robust, most likely because to the decreased number of organisms and variation in specimen collection. There is no information on how well NAATs perform in diagnosing neonatal gonococcal ophthalmia. Other Neisseria species, such as *N. cinerea*, *N. flavescens*, *N. lactamica*, *N. sicca,* and *N. subflava,* which may be present in the conjunctiva, may be detected by PCR and, to a lesser extent, strand displacement amplification. For neonatal C. trachomatis conjunctivitis and pneumonia, oral erythromycin is still the recommended treatment. Oral erythromycin has a 10%-20% failure rate, and some new borns require a second round of treatment. A study found that a three-day course of azithromycin (20 mg/kg/day orally thrice daily for three days) was as efficacious as 14 days of erythromycin in treating neonatal chlamydial conjunctivitis.