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Case Report

Neonatal Chlamydial Conjunctivitis

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Abstract: Infection with *Chlamydia trachomatis* (CT) during pregnancy can result in serious outcomes, including miscarriage, stillbirth, low birth weight, prematurity, neonatal conjunctivitis, and neonatal pneumonia. Despite these risks, routine screening for CT during pregnancy remains infrequent, limiting the opportunity for timely intervention. This report describes a case of neonatal conjunctivitis due to CT in a 9-day-old infant born vaginally to a 15-year-old primigravida. The infant was presented with purulent discharge, eyelid edema, and pustules on the face and neck. The mother had significant risk factors, including adolescence, multiple sexual partners, and untreated vaginal discharge during pregnancy. The conjunctivitis appeared five days postpartum, with a diagnosis confirmed via real-time PCR from conjunctival scrapings. Treatment with intravenous oxacillin, ceftriaxone, and clarithromycin led to full recovery without the development of pneumonia. This case underscores the need to identify maternal risk factors, such as adolescent age, multiple sexual partners, and untreated vaginal discharge during pregnancy, and highlights the importance of enhancing prenatal screening and implementing routine STI testing to prevent neonatal complications.

Keywords: *Chlamydia trachomatis*; Maternal screening; Ophthalmia neonatorum; Sexually transmitted infections (STIs).

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1. Introduction

Chlamydia trachomatis (CT) is an obligate intracellular, gram-negative bacterium with a tropism for columnar epithelial cells, particularly in the conjunctiva, urethra, endocervix, endometrium, and fallopian tubes [1], Risk factors for infection with this organism include early initiation of sexual activity, multiple sexual partners, use of oral hormonal contraceptives in young women, nulliparity, the presence of cervical ectopy, licit and illicit drug use, smoking, and a lack of knowledge about sexually transmitted infections (STIs) [2].

Women infected with CT are often asymptomatic, with 70% to 80% of cases presenting without symptoms. When symptoms do occur, they typically include vaginal discharge, abdominal pain, urinary discomfort, and dyspareunia. CT infection is also associated with complications such as pelvic inflammatory disease (PID), ectopic pregnancy, increased susceptibility to HIV, mother-to-child transmission of HIV, and infertility [3].

In pregnant women, maternal CT infection can result in adverse outcomes for neonates, including miscarriage, preterm birth, stillbirth, low birth weight, neonatal conjunctivitis, and pneumonia [3]. Classically, neonatal conjunctivitis caused by CT manifests 5 to 14 days after birth. The presentation can range from mild conjunctival redness to severe mucopurulent conjunctivitis with chemosis and pseudomembrane formation. This form

of conjunctivitis cannot be prevented by standard ocular prophylaxis with antibiotics or silver nitrate [4].

This study aims to present a case of neonatal conjunctivitis caused by CT, focusing on the unique maternal risk factors that contributed to the vertical transmission of the infection. These factors include the mother's adolescent age, multiple sexual partners, and empirically treated vaginal discharge during pregnancy. This case emphasizes the importance of recognizing maternal risk factors for *Chlamydia* infection, improving prenatal screening, and ensuring adequate maternal care to prevent neonatal complications.

Despite advancements in prenatal care, the persistent global burden of CT infections, estimated at 128.5 million new cases in 2020 [5], underscores significant gaps in screening and management during pregnancy. These deficiencies are particularly concerning in young, asymptomatic pregnant women who are at a higher risk of transmitting the infection to their neonates. The present case exemplifies how these systemic limitations can lead to neonatal complications, highlighting areas that demand urgent improvement in maternal and perinatal care practices.

2. Case Report

A nine-day-old neonate, born via vaginal delivery, presented with purulent discharge from both eyes, more prominent in the left eye (Figure 1), along with hyperemia and eyelid edema that had begun four days earlier. Pustules were also noted on the face, retroauricular areas, scalp, and cervical region. The infant, exclusively breastfed, was afebrile and exhibited no other systemic clinical manifestations.

Figure 1. Photograph of the nine-day-old neonate with chlamydial conjunctivitis. Pronounced purulent discharge in the left eye is visible, accompanied by hyperemia and eyelid edema. Perioral pustules are also observed. To comply with privacy regulations, the facial features above the eye level (nose and mouth region) have been intensely blurred while maintaining the clinical relevance of the image.

Prophylaxis for gonococcal ophthalmia had been administered at birth using silver vitellinate (Argyrol) solution. The mother, a 15-year-old primigravida, tested negative for

syphilis, HIV, hepatitis B, and hepatitis C during both pregnancy and at the time of delivery. She reported experiencing leukorrhea during the last trimester of pregnancy, which was treated with Nystatin without laboratory confirmation of the underlying cause. Additionally, she disclosed having had multiple sexual partners during pregnancy and the use of cannabis, both of which increased her risk for STIs.

Laboratory tests for the neonate revealed leukocytosis (18,200 cells/μL, 6% bands, 40% segmented neutrophils, and 31% lymphocytes) and a platelet count of 250,000/μL. The infant was treated with intravenous oxacillin, ceftriaxone, and clarithromycin. Differential diagnoses considered for the presented symptoms included bacterial pathogens such as *N. gonorrhoeae* and *Staphylococcus aureus*, as well as non-infectious etiologies like neonatal dacryocystitis or chemical conjunctivitis due to ocular prophylaxis. However, the timeline of symptom onset, the presence of purulent discharge, and hyperemia, along with confirmation via real-time PCR from a conjunctival scraping during treatment, conclusively identified CT as the causative agent.

Although detailed follow-up was not explicitly documented, the infant's mother, when contacted after a significant period, reported no complaints or health concerns regarding the baby. This lack of reported issues supports the conclusion of complete recovery and underscores the efficacy of the treatment regimen.

3. Discussion

Two significant pathogens primarily cause neonatal bacterial conjunctivitis: CT (serotypes D through K) and *N. gonorrhoeae*; both are STIs that can lead to conjunctivitis [6]. Historically, *N. gonorrhoeae* was the most common cause of ophthalmia neonatorum, but its incidence has declined following the introduction of prophylaxis with 2% silver nitrate instillation at birth (Credé´s method) [7]. In Brazil today, 1% silver nitrate is reserved for cases where erythromycin 0.5% or tetracycline 1% ointments are unavailable [8]. Our patient received silver vitellinate, a less effective prophylactic agent than silver nitrate for preventing gonococcal ophthalmia.

Approximately 30% to 50% of infants born to mothers with active chlamydial infections develop neonatal conjunctivitis, which may also manifest in the nasopharynx, lungs, vagina, urethra, and rectum. Up to 20% of neonates exposed to *Chlamydia* during delivery will develop pneumonia, with previous conjunctivitis being identified in approximately 50% of these cases [9]. Gonococcal conjunctivitis typically occurs 2 to 5 days after birth, whereas chlamydial conjunctivitis manifests later, between 5 to 14 days postpartum. Chlamydial conjunctivitis often presents with unilateral or bilateral conjunctival redness and watery secretions, which can progress to purulent discharge and pseudomembrane formation [10].

In this case, the neonate developed purulent discharge, particularly in the left eye, on the fifth day of life, which worsened over the subsequent days. Pustular lesions on the face, neck, and scalp were also noted and were attributed to a staphylococcal infection, necessitating treatment with oxacillin. Beyond the clinical presentation and timeline, the neonate's mother had multiple risk factors for *Chlamydia* infection, including being an adolescent, having multiple sexual partners, and using drugs. She also reported vaginal discharge during pregnancy, which was empirically treated with Nystatin without laboratory investigation to determine its cause.

The etiology of the conjunctivitis in this case was confirmed by real-time PCR from a conjunctival scraping, which was positive for CT and negative for *N. gonorrhoeae*. At the time of diagnosis, the infant was already being treated with ceftriaxone, clarithromycin, and oxacillin. Regarding treatment for chlamydial conjunctivitis, while erythromycin is commonly indicated, its use in neonates carries a risk of hypertrophic pyloric stenosis. More extensive research is needed to explore alternative therapies. This case underscores the challenges of empirical treatment during pregnancy, particularly when laboratory investigations are not conducted to confirm the underlying cause of symptoms. The maternal leukorrhea in this case was treated empirically with Nystatin, a regimen inappropriate

for managing CT. This highlights the limitations of symptom-based treatment approaches, which often overlook significant underlying infections. A more comprehensive diagnostic workup, including molecular testing for STIs, could have identified the infection earlier and prevented vertical transmission to the neonate.

The case also emphasizes limitations in current ocular prophylactic strategies. While silver vitellinate was administered at birth to prevent gonococcal ophthalmia, such prophylaxis does not protect against CT. This aligns with previous findings indicating that routine ocular prophylaxis fails to prevent chlamydial conjunctivitis, necessitating targeted maternal screening and treatment during pregnancy [11]. Furthermore, while ocular prophylaxis remains effective for some pathogens, its reliance as a standalone preventive measure for neonatal infections is increasingly debated, with calls for integrated maternal care protocols to address such gaps.

Given the global burden of CT infection, with an estimated 128.5 million new cases annually [5], routine prenatal screening is imperative and must be urgently implemented.

3. Conclusion

This case highlights the critical need for comprehensive maternal screening and effective management of STIs during pregnancy. The occurrence of CT infection in a neonate, despite negative maternal screenings for other STIs, underscores potential deficiencies in current perinatal care and STI testing protocols. The mother's history of inadequately treated leukorrhea and multiple sexual partners further emphasizes the importance of thorough diagnostic evaluation and consistent follow-up throughout pregnancy. Routine screening, including molecular testing for CT, should be integrated into prenatal care protocols, particularly for high-risk populations such as adolescents. Implementing universal screening policies and expanding access to diagnostic tools in resource-limited settings could significantly reduce the risk of vertical transmission and neonatal complications. Additionally, educating healthcare providers and patients about the limitations of empirical treatment and the importance of targeted management strategies is essential for improving perinatal outcomes.

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