LRI Emergency Department and Children's Hospital

Ophthalmia Neonatorum (neonatal conjunctivitis)

Staff relevant to:	Medical and nursing staff within UHL Children's Hospital and Children's Emergency department treating babies presenting with suspected ophthalmia neonatorum.
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Contents

1. Introduction & who this guideline applies to

Definition:

Ophthalmia neonatorum is conjunctivitis of the newborn occurring within the first 28 days of life.
A sticky eye is a relatively common problem in infancy. It is often simply due to a blocked lacrimal duct but may also be caused by a variety of bacterial and viral pathogens.

Causes:

BACTERIAL	VIRAL	Other
• Chlamydia trachomatis • Neisseria gonorrhoeae • Staphylococcus aureus • Streptococcus pneumoniae • Beta-haemolytic streptococci • Haemophilus influenza • Moraxella catarrhalis • Escherichia coli • Pseudomonas species	Herpes simplex Adenovirus	Blocked lacrimal ducts Shampoo, detergent, etc.
Infective		**Non-Infective**

Don't Miss:

Causes associated with potentially severe outcomes, and which are not detected by routine bacterial eye swabs:

- Neisseria gonorrhoeae
- Chlamydia trachomatis
- Herpes simplex virus

Ask for maternal Sexually Transmitted Infection's in history taking.

2. Management Algorithm

Assess if symptoms consistent with ophthalmia neonatorum (see p.4)

YES

NO

Consider conservative management –
- Cleaning
- Topical chloramphenicol
- Safety net advice if worsens

Urgent discussion with –
CAT/PED SpR and on-call Ophthalmology

Take eye swabs x3 (see p.6)
1. Routine – Amies swab
2. NATT – Aptima swab
3. Viral – PCR swab

Record in PED chase book

Start topical Chloramphenicol 0.5% eye drops

If any of the following considered likely by ophthalmology/Paed SpR, commence appropriate management.

Chlamydia infection

- Erythromycin PO for 14 days. Dose as per BNFc. Note - dosing needs to be altered at 1 month of age.
- Assess patient for Pneumonitis (refer to UHL pneumonia guideline)
- Admit patient if any evidence of respiratory involvement
- If baby is clinically well and no systemic signs can be discharged after senior review.

Gonococcal infection

- Cefotaxime 100mg/kg IV single dose (max 1g). IM stat dose can be given if baby is difficult to cannulate.
- Assess patient for sepsis (refer to Sepsis UHL Childrens Hospital Guideline & Meningitis UHL Childrens Medical Guideline
- If baby is clinically well and no systemic signs can be discharged after senior review.

HSV infection

- Admit patient
- IV Aciclovir
- Refer to Neonatal Herpes Simplex UHL Childrens Medical Guideline

Important Pathogens:

It is important to identify specific causes because serious disseminated and systemic infection can potentially be associated with the localised ocular condition for some pathogens:

- *Neisseria gonorrhoeae*
- *Chlamydia trachomatis*
- Herpes simplex (HSV-1 and HSV-2)

A bacterial, chlamydial or viral infection acquired during passage through an infected birth canal. Note that co-infection with more than one pathogen is possible.

Symptoms:

- Redness (conjunctiva +/- lids)
- Discharge (may be profuse in gonococcal infection)
- Swelling of lids (may be severe)

Symptoms usually bilateral (but may be sequential with few days between onset of each eye)

Pathogens: Bacterial: Neisseria Gonorrhoeae & Chlamydia Trachomatis:

	Gonococcal	Chlamydial
Incidence	<1% of infective cases	2-40% of infective cases
Incubation period	Typically 1-3 days	Typically 5-28 days
Transmission	Usually direct (during vaginal delivery); hand-to-eye after birth; occasionally intra-uterine.	Usually direct (during vaginal delivery); hand-to-eye after birth; occasionally intra- uterine. 30-40% chance of conjunctivitis in infants of untreated mothers.
Presentation	Hyperacute conjunctival injection and chemosis, lid oedema and severe purulent discharge	Unilateral/bilateral watery discharge which becomes copious and purulent later on
Complications	Corneal ulceration and perforation Rarely, disseminated infection (arthritis,meningitis, pneumonia, septicaemia)	Chlamydial pneumonia (10- 20% chance in infants of untreated mothers) Corneas rarely affected

**It should be noted that N. gonorrhoeae and C. trachomatis tests are not included in routine antenatal screening. Even if the mother has had testing earlier during pregnancy (e.g. via the National Chlamydia Screening Programme for 16-24 year olds, or via genito-urinary medicine), a negative result does not exclude maternal disease acquired later in pregnancy.*

Viral: Herpes Simplex:

Neonatal conjunctivitis may be one manifestation of Neonatal HSV disease. Skin, eye and mouth (SEM) disease may include excessive tearing, eye pain, conjunctival oedema, and vesicular lesions or ulcers.

Neonates with evidence of SEM disease should undergo evaluation for CNS and disseminated disease. Presentation may be non-specific, and the diagnosis should always be considered in an unwell neonate.

Refer to Neonatal Herpes Simplex UHL Childrens Medical Guideline for further details.

Admission criteria

Consider admission if ocular symptoms are severe and following discussion with ophthalmology or if systemic involvement following discussion with paediatrics.

Chlamydia:

- Assess patient for Pneumonitis (refer to Pneumonia - Inpatient UHL Childrens Hospital Guideline)
- Admit patient if any evidence of respiratory involvement

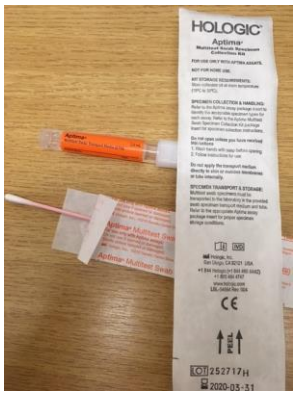
Gonorrhoea:

- Assess patient for sepsis (refer to Sepsis UHL Childrens Hospital Guideline) and/or meningitis (refer to Meningitis UHL Childrens Medical Guideline)
- Asses for severe discharge that may require inpatient management
- If baby clinically well and no systemic signs, can be discharged after senior ophthalmology & paediatric review

Herpes Simplex:

- Any concerns admit and start IV Aciclovir
- Refer to Neonatal Herpes Simplex guidelines

Investigations

Test and target organism(s)	Sample required	Comment
Routine culture and sensitivity *Neisseria gonorrhoeae* *Staphylococcus aureus*  	**Eye swab: Amies swab** ICE ordering: Micro/Virology tab UHL Bact tab Eye swab **Do not refrigerate** **Transport to micro promptly**	*N. gonorrhoeae* is fastidious and is unlikely to survive delay and/or refrigeration. During working hours[$], if *N. gonorrhoeae* strongly suspected, phone 6520 and ask for urgent gram stain and processing, then hand-deliver specimen to lab. Outside working hours, if *N. gonorrhoeae* strongly suspected, obtain sample and phone 6520 when lab is open the next morning (8am) for sample to be processed urgently.
Nucleic Acid Amplification Testing (NAAT) *Chlamydia trachomatis* *Neisseria gonorrhoeae*  	**Eye swab: Chlamydia swab (Aptima Multitest Swab)** ICE ordering: Micro/Virology tab UHL Virol tab Chlamydia and GC detection (Swab)	If kit unavailable on the ward, phone virology lab (6522) Mon-Fri 9-5pm and arrange to collect a kit from Sandringham Level 5 Virology lab. If problems obtaining correct kit, use dry sterile swab and send to virology in plain sterile pot. Samples are run Mon-Fri*. Normal turnaround time is 5 days but processing can be expedited by discussing with virology lab (6522). Same day result may be achievable, depending on time of day. Presumptive *N. gonorrhoeae* require a further day for confirmation.
PCR Testing Herpes simplex virus Adenovirus In some situations: Enterovirus-esp in haemorrhagic conjunctivitis Varicella zoster virus-if chickenpox/shingles suspected	**Eye swab: in Viral Transport Medium** ICE ordering: Micro/Virology tab UHL PCR tests HSV DNA by PCR (genital swabs) Adenovirus DNA by PCR	Eye swabs are processed X3/week (Mon/Wed/Fri)*. *subject to change

$ - For latest information on normal working hours, please refer to the microbiology handbook available on INsite

Antimicrobial therapy

Clinical scenario	Treatment
All cases of suspected bacterial conjunctivitis	Topical chloramphenicol 0.5% eye drops Initially 1 drop every 2 hours then reduce frequency according to severity/healing. TDS/QDS sufficient if less severe. Continue for 48 hours after healing. Review sensitivity results and amend treatment if not sensitive to chloramphenicol.
PLUS any/all of the following if relevant:	
Suspected/confirmed gonorrhoeal conjunctivitis (purulent; occurring <72 hours from birth)	Cefotaxime 100mg/kg IV single dose (max 1g). IM stat dose can be given if baby difficult to cannulate. Disseminated disease will require a course of treatment rather than a single dose; discuss individual cases with microbiology. If no sensitivities available for the neonate, but sensitivity testing has been performed on a maternal sample, please provide details.
Suspected/confirmed chlamydial conjunctivitis	Erythromycin PO for 14 days 12.5 mg/kg/dose QDS (can be given IV if required) (refer to UHL guideline: Antibiotics for Neonatal Infection) Efficacy ~80% Second course may be required. NOTE: small increased risk (4.5%) of pyloric stenosis, warning parents about risks vs. benefits is advised
Suspected/confirmed HSV disease	IV Aciclovir (refer to UHL guideline: Neonatal Herpes Simplex Virus Infection)

Follow up

In all cases:

- Review antimicrobials with culture results and patient's clinical condition

Ophthalmology:

- If baby requires admission (under care of paediatricians) alert the ophthalmology on call team at that time.

- Review daily either as an inpatient by on call Ophthalmology team or if outpatient, via eye casualty; until clear improvement established. Then refer (by telephone) to member of the paediatric ophthalmology team to paediatric ophthalmology clinic for 5-7 day review.

Paediatric:

- If the baby is treated for pneumonitis, sepsis or meningitis, arrange paediatric follow-up as clinically indicated

Genito-Urinary Medicine:

- If gonococcal or chlamydial infection confirmed, parent(s) should be referred to Genito-Urinary Medicine (GUM) clinic.

3. Education and Training

None

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Leads	Frequency	Reporting arrangements
Diagnosis made using appropriate microbiology investigations	Audit to incorporate swabs taken and when	Mr T Islam /Miss N Sarvananthan	Every 3 years	Audit to be recorded within Trust audit department.
Appropriate antibiotic therapy commenced	Audit to incorporate treatment and timing	Mr T Islam/ Miss N Sarvananthan	Every 3 years	Audit to be recorded within Trust audit department
Follow up outcome	Audit to look at visual outcomes (where possible)	Mr T Islam/Miss N Sarvananthan	Every 3 years	Audit to be recorded within Trust audit department

5. Supporting References

1. *Conjunctivitis - infective; NICE CKS, August 2012 (*UK access only)
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4. The Wills Eye Manual
5. Recommendations for the prevention of neonatal ophthalmia; Canadian Paediatric Society
6. Denniston AKO, Murray PI; Oxford Handbook of Ophthalmology, Oxford University Press, 2009
7. List of Notifiable Diseases; Public Health England under the Health Protection Act Regulations April 2010
8. Chlamydial and Gonococcal Infections in Infants and Children; Clinical Infectious Diseases Vol 53 Issue 3 p S99 - S102
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   Moorfields Manual of Ophthalmology
10. Chlamydial Infections, Sexually Transmitted Disease Treatment Guidelines 2010; CDC Centers for Disease Control and Prevention
11. Isenberg SJ, Apt L, Del Signore M, et al; A double application approach to ophthalmia neonatorum prophylaxis. Br J Ophthalmol. 2003 Dec87(12):1449-52.
12. Darling EK, McDonald H; A meta-analysis of the efficacy of ocular prophylactic agents used for the prevention of gonococcal and chlamydial ophthalmianeonatorum. J Midwifery Womens Health. 2010 Jul55(4):319-27.
13. Keenan JD, Eckert S, Rutar T; Cost analysis of povidone-iodine forophthalmia neonatorum prophylaxis. Arch Ophthalmol. 2010 Jan128(1):136-7.
14. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases,
15. Eighth Edition (2014). Saunders.
16. NHS Fife Area Drugs and Therapeutics Committee guidelines
17. Royal Cornwall Hospitals Neonatal Clinical Guidelines: Eye Infections
18. Birmingham and Midlands Eye Centre Guidelines: Ophthalmia Neonatorum

6. Key Words

Chlamydia trachomatis, Herpes simplex virus, Neisseria gonorrhoeae, Sticky home

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The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

CONTACT AND REVIEW DETAILS	
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Details of Changes made during review: New guideline	