1. Introduction

Periorbital infections are infections involving the soft tissues surrounding the globe of the eye. Chandler’s classification has been used to describe periorbital infections (see appendix Table 3). The term ‘periorbital cellulitis’ encompasses both preseptal and orbital cellulitis.

2. Scope

This guideline is for the use of clinical staff working within the Children’s Hospital and Emergency Department presenting with suspected or confirmed cases of preseptal or orbital cellulitis.

Related documents

UHL Aseptic non-touch technique policy B20/2013
UHL Consent to examination and treatment A16/2002
UHL Infection prevention policy B4/2005
UHL Intravenous Medication & fluids policy B25/2010
UHL Neurological observations following minor head injury C1/2010
UHL Paediatric Sepsis guideline B31/2016
UHL Venous access policy B13/2010
3. Management of Children with Preseptal and Orbital Cellulitis

### Mild preseptal cellulitis (all criteria to be fulfilled):
1. Eyelid swelling and/or erythema only
2. White eye
3. Normal eye movements
4. Systemically well

#### Severe Preseptal cellulitis or Orbital cellulitis:
1. Eyelid oedema/erythema plus one red flag* sign (see box below)
2. Cellulitis failing to respond to or worsening with 48 hours of appropriate PO Antibiotics

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#### No improvement in 24-36hrs

- IV antibiotics / nasal decongestants until fit for home
- PO Co-amoxiclav or as per culture results (10/7 of Antibiotics *)
- Discuss with microbiology for complicated orbital cellulitis (ie. abscess/cavernous sinus thrombosis)
- Open access to CAU for 72 hours post-discharge

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#### Improving

1. IV Ceftriaxone (IV cefotaxime if under 1 month of age)
2. Add IV Metronidazole to IV Ceftriaxone/Cefotaxime and nasal decongestants if sinus involvement suspected in orbital cellulitis
3. Prompt Ophthalmology and ENT review
4. 4 hourly neuro observations
5. Consider need for CT (see indications below)
6. Consider presence of sepsis – if so; manage as per Sepsis guideline available on INsite

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### Safety netting:
1. Advise parent/carer to urgently attend eye casualty or ED if any red flag symptoms* develop (see box below) or if failing to respond to 48 hours of PO Antibiotics.
2. Consider need for referral to ophthalmology/ENT, if any doubt that PO Antibiotics alone is sufficient
3. Admission should be considered for children who are <3 years old even in the absence of red flag signs

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### Red flag signs/symptoms (see Table 2 in appendix for definitions)
1. Proptosis
2. Chemosis
3. Ophthalmoplegia
4. Relative afferent pupillary defect (RAPD)
5. Systemically unwell
6. Painful eye movement
7. Altered visual acuity

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### Indications for contrast enhanced CT orbits/sinuses/brain
1. Proptosis
2. Relative afferent pupillary defect (RAPD)
3. Ophthalmoplegia (restricted eye movements, diplopia)
4. Blurring / Reduced visual acuity
5. Disturbed colour vision (check red colour)
6. Unable to assess globe due to severe swelling
7. Neurological signs/symptoms
8. No clinical improvement and/or swinging pyrexia despite 24-36 hours of IV Antibiotics

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### Checklist
- Ophtalmology assessment
- ENT assessment
- Consider need for imaging
- Liaise with microbiology

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*To discuss with microbiology if patient is penicillin allergic*
3.1 Background

Preseptal cellulitis is defined as infection anterior to the orbital septum. The orbital septum is a layer of fibrous tissue that arises from the periosteum of the skull and continues into the eyelids. This provides an effective barrier against the spread of infection from the preseptal tissues into the orbit. Preseptal cellulitis is much more common in children and is generally associated with more favourable outcomes. Preseptal tissues may be infected as a result from trauma (ie. insect bites, scratches), upper respiratory tract infection, or contiguous spread from adjacent tissues (ie. conjunctivitis, blepharitis, dacryocystitis). The most common causative organisms are *Strep pyogenes* (Group A Streptococci), *Staph aureus*, *Strep pneumoniae*, and *H. influenzae*.

Orbital (postseptal) cellulitis occurs when the infection has breached or located posteriorly to the orbital septum. It usually arises from a secondary spread from adjacent paranasal sinusitis particularly the ethmoid sinus but can rarely follow penetrating trauma, haematogenous spread or eye surgery. Orbital cellulitis may be complicated by the development of subperiosteal abscess, orbital abscess or cavernous sinus thrombosis. Orbital cellulitis is an ocular emergency and occurs more commonly in older children. It can be caused by Streptococcus spp (*Strep milleri*, *Strep pyogenes*, *Strep pneumoniae*), anaerobes and *H. influenzae*. *H. influenzae* type b is now uncommon with the routine childhood Hib immunisation.

Immunocompromised children may be infected with more unusual pathogens such as fungi and other gram negative bacilli such as *Pseudomonas aeruginosa*.

3.2 Table 1

<table>
<thead>
<tr>
<th></th>
<th>Preseptal cellulitis</th>
<th>Orbital (postseptal) cellulitis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pathogenesis</strong></td>
<td>Lid trauma, contiguous spread from adjacent tissues, conjunctivitis, blepharitis, dacryocystitis, bacteraemia</td>
<td>Sinusitis, trauma/ocular surgery, bacteraemia</td>
</tr>
<tr>
<td><strong>Clinical findings</strong></td>
<td>Erythematous/swollen lid and/or surrounding eye tissues</td>
<td>Erythematous and swollen lid and surrounding tissues</td>
</tr>
<tr>
<td></td>
<td>Normal vision, no RAPD, extra-ocular movements full and painless, no proptosis</td>
<td>Eye pain, proptosis, chemosis, ophthalmoplegia, impaired visual acuity, painful eye movements</td>
</tr>
<tr>
<td></td>
<td>Fever may be present but is usually mild and child is systemically well</td>
<td>Most have fever and usually systemically unwell</td>
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</tbody>
</table>
4. Education and Training

This guideline will be available on Insite for access to staff working in paediatric ED and Children’s Hospital.

5. Monitoring and Audit Criteria

<table>
<thead>
<tr>
<th>Key Performance Indicator</th>
<th>Method of Assessment</th>
<th>Frequency</th>
<th>Lead</th>
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<tbody>
<tr>
<td>100% appropriate use of antibiotics according to the guideline</td>
<td>Review of case notes/ICE documentation</td>
<td>Annual</td>
<td>Paediatric or Microbiology team</td>
</tr>
<tr>
<td>100% prompt ENT and ophthalmology review in suspected orbital cellulitis cases</td>
<td>Review of case notes documentation</td>
<td>Annual</td>
<td>Paediatric, ENT or Ophthalmology team</td>
</tr>
</tbody>
</table>

6. Legal Liability Guideline Statement

Guidelines issued and approved by the Trust are considered to represent best practice. Staff may only exceptionally depart from any relevant Trust guidelines providing always that such departure is confined to the specific needs of individual circumstances. In healthcare delivery such departure shall only be undertaken where, in the judgement of the responsible healthcare professional, it is fully appropriate and justifiable - such decision to be fully recorded in the patient’s notes.

7. Equality Statement

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/guideline and its impact on equality have been reviewed and no detriment was identified.

8. Supporting Documents and Key References

7) NICE guideline CG160: Fever in under 5s: assessment and initial management. May 2013

9. Key Words

Preseptal, Orbital, Cellulitis, Paediatrics
Appendix

Table 2: Definition of red flag signs/symptoms

<table>
<thead>
<tr>
<th></th>
<th>Definition</th>
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<tbody>
<tr>
<td>Proptosis</td>
<td>Bulging of the eye anteriorly out of the orbit</td>
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<tr>
<td>Chemosis</td>
<td>Swelling (or oedema) of the conjunctiva</td>
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<tr>
<td>Ophthalmoplegia</td>
<td>Paralysis or weakness of the eye muscle(s)</td>
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<tr>
<td>Relative afferent pupillary reflex (RAPD)</td>
<td>A medical sign observed during the swinging-flashlight test whereupon the patient's pupils constrict less (therefore appearing to dilate) when a bright light is swung from the unaffected eye to the affected eye.</td>
</tr>
<tr>
<td>Systemically unwell</td>
<td>A child with systemic signs of infection (ie. fever &gt;38 C or &lt;36 C and abnormal observations). Under 5 years old: The child is considered to be systemically unwell if they have any red or amber symptoms or signs on the NICE ‘traffic light’ system (refer to NICE guidelines CG160)</td>
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Table 3: Chandler’s classification

<table>
<thead>
<tr>
<th>Chandler et al, Periorbital Classification</th>
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<tbody>
<tr>
<td>1. Pre-septal cellulitis</td>
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<tr>
<td>2. Orbital cellulitis</td>
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<tr>
<td>3. Subperiosteal abscess</td>
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<tr>
<td>4. Orbital abscess</td>
</tr>
<tr>
<td>5. Cavernous sinus thrombosis</td>
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</tbody>
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