
DOI link
https://doi.org/10.1111/coa.13020

ePrints link
http://eprint.ncl.ac.uk/pub_details2.aspx?pub_id=243629

Date deposited
08/12/2017

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A review of periorbital cellulitis guidelines in Fifty-One Acute Admitting Units in the United Kingdom

1 | INTRODUCTION

Periorbital cellulitis is an acute infection of the periorbital soft tissues with potential sight and life-threatening complications that most commonly occurs in children. Post-septal abscess formation can cause loss of sight; furthermore, posterior spread of infection may progress to cavernous sinus thrombosis and intracranial infection. In England April 2014-March 2015, 3687 patients attended hospital with periorbital cellulitis costing the National Health Service over £9.5 million per annum before considering the cost of treating its complications.

Management of periorbital cellulitis is complex, and it is not uncommon for patients to fall between up to three specialties: otolaryngology, ophthalmology and paediatrics (depending on the age of the patient). Otolaryngologists may aid with ascertaining the aetiology of the condition as well as providing surgical intervention.

The objective of this study was to establish the current periorbital cellulitis management strategies in the United Kingdom (UK) through analysis of the prevalence of guidelines and comparison against evidence-based management.

2 | METHODS

Ethical consideration concluded that this study was a service evaluation project.

Fifty-one acute admitting otolaryngology units were selected from each regional Health Education Authority across the UK, with a minimum of 2 per Health Education Authority and contacted via telephone by AO. Units in each HEA were split into tertiary and non-tertiary centres and arranged in alphabetical order. First on-call otolaryngologists were contacted at each unit in alphabetical order, if unreachable the next unit on the list was contacted. A tertiary and non-tertiary care centre were contacted in each HEA.

3 | RESULTS

3.1 | Demographics

First on-call Otolaryngology doctors of various grades (Figure 1) were contacted from 51 acute admitting units in the UK; 27 tertiary referral units and 24 secondary referral units by telephone (Figure 2).

Twenty-three trusts of 51 (45.1%) were confirmed as having 24 guidelines (one unit had separate adult and paediatric guidance) for the treatment of periorbital cellulitis. Eighteen of the 24 (75%) guidelines found were obtained from 17 trusts for analysis. Three additional microbiology guidelines for the treatment of periorbital cellulitis were obtained from three separate healthcare trusts.

3.2 | Laboratory investigations (from 18 guidelines)

Six (33.3%) guidelines did not specify any laboratory investigations. All other 12 (66.7%) guidelines specified a full blood count and C-reactive protein level, 4 (22.2%) asked for urea and electrolytes levels, 1 (5.6%) specified an erythrocyte sedimentation rate and 1 (5.6%) a serum lactate level.

3.3 | Microbiology

Three (16.7%) guidelines did not specify any microbiological investigations. All remaining 15 (83.3%) guidelines specified a blood culture to be taken from patients; however, one of which only if the patient was pyrexial. Seven (38.9%) guidelines required eye swabs (one guideline recommends no eye swab because of the risk of
contamination), 3 (16.7%) nasal swabs, 3 (16.7%) specified considering a lumbar puncture (if central nervous system signs or meningism). One (5.6%) guideline specified streptococcus pneumoniae and haemophilus influenzae PCR (polymerase chain reaction) tests and 1 (5.6%) further guideline required the patient to undergo a throat swab.

The choice of antibiotic (Figure 3) varied across the 18 guidelines obtained and the 3 microbiology guidelines. Eleven (52.4%) units covered anaerobes in their first-line antibiotics with metronidazole (8), clindamycin (2) or topical chloramphenicol (1).

3.4 | Medical adjuncts

Nine (50%) guidelines suggested the use of medical adjuncts. Three (16.7%) of the guidelines specified the use of xylometazoline hydrochloride (Otrivine) nasal spray, 3 (16.7%) also specified topical ephephrine, 1 (5.6%) oral pseudoephedrine (Sudafed), 1 specified phenylephrine nasal drops, 1 (5.6%) beclomethasone nasal spray (Beconase) and 2 (11.1%) guidelines asked for the use of nasal decongestants but did not specify the drug or the route of administration.

3.5 | Imaging

Three (16.7%) of the guidelines examined did not give any criteria for imaging, while a further two (11.1%) recommend imaging all patients with suspected periorbital cellulitis. The remaining 13 (72.2%) guidelines recommend imaging patients if they have any central nervous system signs, eye signs (eg, diplopia, reduced visual
acuity or ophthalmoplegia), inability to assess the patient’s eye or failure to respond to intravenous antibiotics after 24-48 hours. The preferred imaging modality varied between guidelines, Figure 4.

3.6  |  Admission

Five (27.8%) guidelines identified had no criteria for admission, 8 (44.4%) specified all patients to be admitted. Five (27.8%) guidelines required admission if patients are pyrexial, have eye symptoms such as diplopia, reduced visual acuity or ophthalmoplegia or are generally unwell or who have not improved after 24-48 hours of oral antibiotics. The lead specialty for admission varied between guidelines. Six (33.3%) guidelines did not specify the frequency or extent of cross-specialty review. Nine (50%) guidelines studied required Ophthalmology and Otolaryngology review for all patients admitted with suspected periorbital cellulitis. One (5.6%) specified only Otolaryngology review and two (11.1%) specified only ophthalmology review.

3.7  |  Surgery

Ten (55.6%) of the guidelines examined did not specify surgical indications for patients with suspected periorbital cellulitis. One (5.6%) guideline specified rapidly deteriorating vision as an indication for surgery; 4 (22.2%) use radiological evidence of a periorbital abscess; and two (11.1%) clinical suspicion of periorbital abscess as indications for surgery.

4  |  DISCUSSION

4.1  |  Clinical applicability

The most striking observation from this snapshot of orbital cellulitis guidance was that less than half (45.1%) of units contacted had formal guidance readily available for first on-call otolaryngologists for an emergency that has sight and potentially life-threatening complications. 72.5% of on-call doctors contacted were foundation doctors, core trainees or GP trainees, therefore, likely inexperienced at assessment of a relatively infrequent but serious pathology.

The most frequent complications of periorbital cellulitis are visual and therefore specialist review by an Ophthalmologist should always be sought. However, only 61.1% of guidelines specified ophthalmology review for patients admitted with periorbital cellulitis, a sight-threatening infection. Furthermore, frequency of review was often not specified.

Imaging in periorbital cellulitis should occur if there is suspicion of a subperiosteal, orbital or intracranial abscess. Clinical signs that may indicate the above are specified in 72.2% of guidelines and include but are not limited to: no clinical improvement after 24-48 hours of best medical therapy, eye signs, inability to assess the eye, or central nervous system signs. Predictive accuracy of subperiosteal or orbital abscess by clinical judgment alone is 82%, this increases to 91% after contrast CT, with MRI a useful tool in cases of diagnostic uncertainty or a suspicion of intracranial complications. Less than a quarter (22.2%) of guidelines specified contrast CT orbit and paranasal sinuses (half of these also included any indication of when a CT contrast brain scan should be performed), a
further (5.6%) guideline required a CT orbit and paranasal sinuses without specifying contrast status.

Initial treatment of periorbital cellulitis with no suspicion of subperiosteal/orbital abscess, or a small (<10 mm), medial subperiosteal abscess in a young child (<9 years old) may consist of intravenous antibiotics. Although 25% of surgical cultures in periorbital cellulitis contain anaerobes only half (52.4%) of the units that returned guidelines routinely covered anaerobic bacteria in first-line treatment. Radiological evidence of an abscess that differs to what is described above and clinical deterioration are all indications for surgical intervention; less than half (44.4%) of guidelines specified these indications for surgery.4

4.2 | Strengths of the study

This study contacted multiple units throughout all health education authorities in the UK. First on-call doctors were consulted, as they are likely to encounter periorbital cellulitis patients; therefore, guidelines are likely to be representative of patient management.

4.3 | Limitations

The ability to find appropriate protocols is user dependent, therefore protocols might exist in some units that first on-call otolaryngologists were unable to locate. However, if this is the case, it reflects the dilemmas junior clinicians face. Six (25%) protocols were not obtained, the contents of these are unknown and may have contributed to a differing view of our results.

CONFLICT OF INTEREST

None to declare.

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