The Lymphoedema Practitioner must implement appropriate action to ensure the immediate and correct treatment of cellulitis. Where appropriate, they should educate other healthcare professionals, patients and carers in the prevention, recognition and treatment of cellulitis, highlighting the importance of prompt action.

**Procedure**

**Assess the condition of the limb and adjacent truncal area observing for:**

- Any damage to the skin.
- Redness which is general or in the form of a rash.
- Raised skin temperature.
- Degree of tenderness/pain.
- Does the patient complain of “flu like” symptoms including fever, shivers and malaise
- Increased swelling.

**If the patient presents with this problem over the telephone, we advise that they should take the appropriate action:**

- Consult GP or on call doctor within 12 hours for urgent review and antibiotic prescription.
- Remove hosiery – Until treatment with antibiotics is commenced, compression garments should not be worn until the patient feels that the sleeve or stocking is comfortable.
- Discontinue Simple Lymphatic Drainage (SLD) or Medical Lymphatic Drainage (MLD) until infection completely resolved and course of antibiotics completed.
- Antibiotics should be prescribed in relation to the British Lymphology Society (BLS) revised guidelines March 2013 (Appendix 1) unless advised otherwise by a microbiologist. All patients should be given a Lymphoedema Support Network (LSN) leaflet detailing these guidelines at their initial appointment and they should be advised to take this with them when seeing the doctor if cellulitis is suspected.
- Should there be clinical signs of residual cellulitis on completion of antibiotics, further courses may be required as per guidelines.
- Prophylactic antibiotics should be considered if the patient experiences two or more episodes of cellulitis within twelve months. The lymphoedema practitioner should write to the GP to request these if appropriate.

**Patient seen in the clinic with Acute Inflammatory Episodes:**

- The procedure is the same as those telephoning for advice. However, it may be necessary for the practitioner to fax the GP or on call doctor to request antibiotics enclosing a copy of the recommended guidelines with the fax.
Patients who are receiving intensive treatment and who develop cellulitis during treatment:

- Treatment should be reviewed as soon as possible by the Lymphoedema practitioner and may be discontinued and rescheduled after a course of antibiotics.
- For patients who have a cellulitic history, the Lymphoedema practitioner should refer to the BLS revised cellulitis guidelines 2013 for management with oral antibiotics during a course of intensive treatment.
- If patients are receiving long term bandaging it might not be appropriate to discontinue treatment and treatment should continue with caution.

**Documentation**

- Findings must be documented.
- All communications with health care professionals and patients regarding changes in condition, including treatment and response, should be recorded in the patient’s Electronic Healthcare Record.

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**Issuing Authority:** Helen McGee, Consultant
Cellulitis is an acute spreading inflammation of the skin and subcutaneous tissues characterised by pain, warmth, swelling and erythema. In lymphoedema, attacks are variable in presentation and, because of differences from classical cellulitis, are often called acute inflammatory episodes. Cellulitis will be the term used here (related terms: erysipelas, lymphangitis). Most episodes are believed to be caused by Group A Streptococci (Mortimer 2000, Cox 2009). However, microbiologists consider Staph aureus to be the cause in some patients (e.g. Chira and Miller, 2010).

Some episodes are accompanied by severe systemic upset, with high fever and rigors; others are milder, with minimal or no fever. Increased swelling of the affected area may occur. Inflammatory markers (CRP, ESR) may be raised. It is difficult to predict response to treatment.

A recent Cochrane review concluded that it was not possible to define the best treatment for cellulitis in general based upon existing evidence (Kilburn et al 2010). Furthermore, the treatment of cellulitis in lymphoedema may differ from conventional cellulitis.

With this background, this consensus document makes recommendations about the use of antibiotics for cellulitis in patients with lymphoedema, and advises when admission to hospital is indicated. Prompt treatment is essential to avoid further damage to the lymphatics of the affected part which in turn may predispose to repeated attacks.

1. ACUTE ATTACK OF CELLULITIS

1.1. A decision whether hospital admission is indicated should be based on the level of systemic upset i.e. if:
- signs of sepsicaemia (hypotension, tachycardia, severe pyrexia, confusion, tachypnoea or vomiting) are an absolute indication for admission;
- continuing or deteriorating systemic signs, with or without deteriorating local signs, after 48hrs of antibiotic treatment;
- unresolving or deteriorating local signs, with or without systemic signs, despite trials of first and second line antibiotics.

1.2. Management at home

1.2.1. It is essential that the patient is closely monitored, ideally by the GP. To establish a baseline to monitor progress, record:
- extent and severity of rash – if possible, mark and date the edge of the erythema (may be difficult in lymphoedema as the rash is often blotchy);
- level of systemic upset;

CRP/ESR/white cell count may be helpful in diagnosis and monitoring of treatment.

Microbiology of any cuts or breaks in the skin should be considered before antibiotics are started.

1.2.2. Oral amoxicillin 500mg 8-hourly is the treatment of choice. If there is any evidence of Staph aureus infection e.g. folliculitis, pus formation or crusted dermatitis, then flucloxacillin 500mg 6-hourly should be prescribed in addition or as an alternative.

Microbiologists suggest that the use of single agent Flucloxacillin for all cellulitis covers both Strep. and Staph. infections. This is, therefore, an acceptable alternative. (See www.thebls.co.uk or www.lymphoedema.org for more detailed discussion of the relative merits of Amoxicillin and Flucloxacillin).

1.2.3. Patients who are allergic to penicillin should be prescribed erythromycin 500mg 6-hourly or clarithromycin 500mg 12-hourly (see also 3.1-3.3).

1.2.4. If there is no or a poor response (unresolving inflammation or development of systemic symptoms) to oral amoxicillin after 48 hours, then clindamycin 300mg 6-hourly should be substituted as second line oral treatment.

1.2.5. Antibiotics should be continued until all signs of acute inflammation have resolved; this may mean taking antibiotics for 1-2 months and the course of antibiotics should be for no less than 14 days from the time a definite clinical response is observed. Skin changes e.g. discolouration / staining may persist for months or longer following severe cellulitis and do not necessarily require ongoing antibiotics.

1.2.6. Bed rest and elevation of the affected part is essential. Avoid compression garments during the acute attack. However, they should be replaced as soon as the affected area is comfortable enough to tolerate them.

1.2.7. Appropriate analgesia, e.g. paracetamol, as necessary. It is probably advisable to avoid NSAIDS e.g. ibuprofen during the acute attack. On occasions these medications may be associated with rare complications such as necrotizing fasciitis.
1.2.8. When the inflammation is sufficiently reduced, wearing of compression garments and normal levels of exercise may resume. A return to work depends on the patient’s occupation, and there being no deterioration when normal levels of exercise are established.

1.2.9. Unusual circumstances, e.g. animal bite or lick preceding an attack, or a failure of infection to respond to above recommendations, should prompt discussions with a local microbiologist.

1.3. Management in hospital

1.3.1. Choice of antibiotics in hospital is usually made according to local guidelines. Hospital guidelines commonly recommend single agent i.v. Flucloxacillin 2g 6hly, as this is felt to cover both Staph. and Strep. infections (Leman and Mukherjee, 2005)

1.3.2. If there is no or a poor response to this regimen after 48 hours, clindamycin 600mg 6-hourly iv should be substituted.

1.3.3. Penicillin allergic patients should receive clindamycin as in 1.3.2.

1.3.4. For the treatment of ano-genital cellulitis the recommended first line treatment is amoxicillin 2g 8-hourly iv plus gentamicin 5mg/kg iv daily; dose to be adjusted according to renal function and assay. NB: Local hospital guidelines may differ from this.

1.3.5. Monitoring of CRP / ESR / WCC / temperature is recommended and microbiology of any cuts or breaks in the skin before antibiotics started. Blood cultures may be appropriate.

1.3.6. Extent and severity of rash – if possible, mark and date the edge of the erythema (may be difficult in lymphoedema as the rash is often blotchy).

1.3.7. A switch to oral treatment with amoxicillin 500mg 8-hourly, or clindamycin 300mg 6-hourly should not be made before:

- Temperature down for 48 hours;
- Inflammation much resolved;
- CRP falling.

then continue as in 1.2.5 to 1.2.9.

1.4. Antibiotics “in case”

1.4.1. The risk of further attacks of cellulitis in lymphoedema is high. It is recommended that patients who have had an attack of cellulitis should carry a two week supply of antibiotics with them particularly when away from home for any length of time, e.g. on holiday. Amoxicillin 500mg tds is recommended or, for those allergic to penicillin, erythromycin 500mg qds or clarithromycin 500mg bd. Antibiotics should be started immediately familiar symptoms of cellulitis develop but a medical opinion should be sought as soon as possible.

1.4.2. There is evidence that decongestive lymphatic therapy (DLT) reduces the frequency of attacks (Ko et al 1998). Control of the swelling is therefore important. Patients undergoing intensive DLT and known to have suffered cellulitis in the past during DLT may benefit from antibiotic cover in case cellulitis is provoked.

- Patients who have not experienced previous episodes of cellulitis do not require antibiotics during intensive treatments.
- It is recommended that patients with a history of previous episode(s) of cellulitis during DLT are prescribed a prophylactic dose of antibiotic for the duration of the intensive treatment.
- For patients already receiving prophylactic antibiotics it is recommended that a therapeutic course of antibiotics are prescribed for the duration of the intensive treatment.

1.4.3. Patients undergoing surgical procedures on the lymphoedematous region should receive a therapeutic course of antibiotics commenced before surgery (oral or iv as appropriate) as described previously (see points 1.2.2 or 1.2.3) or as indicated by the procedure.

2. RECURRENT CELLULITIS

2.1. Antibiotic prophylaxis should be considered in patients who have two or more attacks of cellulitis per year. Penicillin V 250mg bd (500g bd if BMI ≥ 33, refer to end for guide) should be the first choice. The dose may be reduced to 250mg daily after one year of successful prophylaxis. Prophylaxis may need to be life-long if relapse occurs when antibiotics are discontinued after a two year period of successful prophylaxis. For those allergic to penicillin, erythromycin 250mg bd is recommended; if this is not tolerated then clarithromycin 250mg daily is an alternative (see also 3.1-3.3). It is recommended that patients requiring antibiotic prophylaxis for ano-genital cellulitis should receive trimethoprim 100mg daily taken at night.

2.2. Apart from the swelling, other risk factors for recurrent cellulitis including cracked, macerated, inter-digital skin, dermatitis, open wounds including leg ulcers, and weeping lymphangiectasia (leaking lymph blisters on the skin surface) should be treated. Treatment of inter-digital fungus should be with application of terbinafine cream daily for two weeks. This may be followed by maintenance treatment, providing the skin is unbroken, with alcohol wipes daily.
2.3. It may not be possible to fully prevent further episodes of cellulitis even with prophylactic antibiotics. However, there may be a reduction in the frequency of cellulitis and / or the severity of episodes. If the response to first line prophylactic antibiotics is inadequate then alternative strategies including trials of other prophylactic antibiotics e.g. clindamycin 150mg daily or cefalexin 125mg daily or doxycycline 50mg daily may need to be considered. In these circumstances, review by local specialist lymphoedema services and advice from microbiologists is recommended. There is a need to balance the use of certain antibiotics (eg clindamycin, cefalexin) as prophylaxis against the risk of predisposing to C.difficile infections.

2.4. The Health Protection Agency’s 2008 annual report on antimicrobial resistance and prescribing reported that no resistance to penicillin has been observed in the UK or elsewhere when prescribed for the treatment of group A Streptococci.

3. DRUG INTERACTIONS

3.1. It is recommended that the prescriber checks individual drug interactions particularly when prescribing macrolides e.g. erythromycin, and clarithromycin. The most common interactions are outlined below (3.3-3.4).

3.2. Patients who have experienced an anaphylactic reaction to penicillin should not be given antibiotics from the cephalosporin family e.g. cefuroxime, cefotaxime, cefazadime and cefalexin.

3.3. For patients receiving a statin e.g. simvastatin or atorvastatin who are penicillin allergic (not anaphylaxis) the recommended first line antibiotics are cefalexin 500mg taken 8-hourly or doxycycline 200mg taken for the first day and then 100mg daily. Patients requiring prophylactic antibiotics should be offered cefalexin 125mg taken at night or doxycycline 50mg daily.

3.4. It is known that many of the different groups of antibiotics alter the anti coagulant effect of coumarins e.g. warfarin. It is advised that the interactions are checked before prescribing antibiotics for patients receiving coumarins.

4. RECOMMENDATIONS FOR THE TREATMENT OF CELLULITIS IN CHILDREN WITH LYMPHOEDEMA

4.1. As in adults, cellulitis in children may present with local symptoms of pain, discomfort, redness or swelling with or without general ill health and malaise. It is important to treat early and recognise that those children who present with systemic symptoms of infection or have deteriorating local signs should be seen in hospital and treated aggressively with intravenous antibiotics.

4.2. The management of cellulitis in children with lymphoedema should follow the previous sections (1-3) with reference to appropriate documents (e.g. BNF) to determine the required antibiotic dose(s).

4.3. It has been suggested that children requiring hospital admission should receive amoxicillin plus flucloxacillin. If there is any suspicion of toxic shock syndrome clindamycin should be prescribed in addition to amoxicillin and flucloxacillin.

References:


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2. Member of 2009/10 update consensus panel
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Lisa Lawrence Clinical Librarian, Derby Hospitals NHSF Trust
Katie Riches, Research Nurse, Derby Hospitals NHSF Trust.

BMI approximate calculations (to be used if unable to obtain height and weight)

- At 5 foot 2 inches (1.58m) an individual would have a BMI of >33 if they weighed more than 12 stone 13lbs (82kg).
- At 5 foot 4 inches (1.62m) an individual would have a BMI of >33 if they weighed more than 13 stone 8lbs (86kg).
- At 5 foot 7 inches (1.7m) an individual would have a BMI of >33 if they weighed more than 15 stone (95kg).
- At 5 foot 10 inches (1.78m) an individual would have a BMI of >33 if they weighed more than 16 stone 10lbs (106kg).
- At 6 foot 1 inches (1.86m) an individual would have a BMI of >33 if they weighed more than 17 stone 13lbs (114kg).

Revised & Updated March 2013 the British Lymphology Society and the Lymphoedema Support Network.
The Consensus Panel and the LSN/BLS would welcome any comments from users. All comments should be sent to the LSN office

http://www.thebls.com/consensus.php