Common bacterial skin infections in practice

David Buckley looks at treatment of skin infections caused by two very common bacteria, *staphylococcus aureus* and *streptococcus pyogenes*

The two most common bacteria to cause skin infections are *staphylococcus aureus* (staph aureus) and *streptococcus pyogenes* (strep). The specifications for these bacteria can be found in Table 1 and Table 2.

**Staphylococcus aureus**

This organism is most commonly known for causing the golden crusty lesions seen in impetigo (*aureus* is the Latin for gold). This is most common in children, and can be quite infectious, spreading to siblings and classmates. It most commonly involves the face and exposed sites. The children are usually otherwise healthy.

*Staph aureus* usually starts with some small vesicles that rupture and develop a golden crust. This can spread locally and after a few days satellite lesions occur around the original site and sometimes on distant sites. *Staph aureus* can sometimes be confused with a *herpes simplex* and ringworm, as lesions are sometimes discoid or anular.

**Impetigo**

Impetigo can be caused by either *staphylococcus* or *streptococci* infections. Sometimes a blister develops (bullous impetigo) and when this occurs it is more likely as a result of staphylococcus infection.

Treatment of milder cases may respond to topical fusidic acid (Fucidin cream). However, resistance is becoming increasingly more common. Fortunately, resistance is not stable and will usually fade if the drug is stopped. Therefore, Fucidin cream should be used for short courses of not more than two weeks, and courses should not be repeated for at least six to 12 weeks if possible.

For more severe or widespread infection, oral flucloxacillin for seven days should be added to topical Fucidin cream. For patients who are allergic to penicillin, oral erythromycin should be given in maximum dosage for a similar duration. Patients and carers should be instructed about careful handwashing and should be advised to use their own towels and facecloths to prevent cross-infection.

**Folliculitis**

Folliculitis (hair follicle infection) is usually caused by *staphylococci* when the bacteria penetrate down through the hair shaft to cause a deep-seated infection in the hair follicles (see Figure 1). This obviously occurs only in the hairy parts of the body, such as the beard area, in the scalp or on the trunk in men, or on the legs in women who shave or wax.

Close inspection with good light and a magnifying lens will show multiple small areas of erythema around the hair shafts, which sometimes progress onto small papules and pustules. Like impetigo, minor cases might respond to topical fusidic acid but more deep-seated or widespread infection will require a long course of oral flucloxacillin for two to six weeks.

For resistant cases, nasal swabs should be taken to rule out nasal carriage as a focus for reinfection. This can be treated with topical nasal antibiotics such as Naseptin or Nasal Bactroban.

Folliculitis can sometimes be due to traumas, such as from shaving or waxing. In addition, applications of tar, oils, or greasy ointments can also lead to folliculitis.

When prescribing greasy moisturisers, such as emulsif-
The skin in children with atopic eczema is usually dry and itchy. However, if the eczema becomes weepy and painful it is usually a sign of secondary infection. In this situation, the normal treatment of atopic eczema with emollients and topical steroids or topical immunomodulators, such as tacrolimus (Protopic) will not work.

Topical antibiotics such as fusidic acid may help with minor infected exacerbations of eczema. However, most cases need systemic antibiotics, usually with flucloxacillin (or erythromycin if penicillin-allergic) for at least seven to 14 days in the maximum dose allowed for the particular age group.

Often, I will use both an oral and topical antibiotic, but it is important to stop both after a maximum of two weeks, to reduce the development of resistant organisms. Once the infection has cleared up, the patient can go back on their maintenance treatment of emollients and topical steroids, or topical immunomodulators.

**MRSA (methicillin resistant staphylococcus aureus)**

MRSA was considered a hospital infection up until a few years ago. However, it is now commonly found in the community. Many patients in nursing homes and patients in the community with chronic wounds, such as leg ulcers, can be colonised or infected by MRSA. MRSA is not more virulent than ordinary staph aureus but it is harder to treat because of staph resistance to multiple drugs.

*Staphylococcus aureus* is generally a non-pathogenic organism, found in the nose and on the skin in about one-third of healthy individuals. Up to 90% of patients with atopic eczema are colonised with *staphylococcus aureus*. It is only when *staph aureus* gains access to deeper tissues, via broken skin, that it may result in a variety of skin infections such as impetigo, folliculitis, boils or secondary skin infection. It can also cause cellulitis and bacteremia. This can be a serious and potentially life-threatening problem, particularly if the infection is due to an MRSA strain.

Some patients in nursing homes and those discharged from hospitals may be carriers of the MRSA strain without having any clinical infection. With such patients, simple hygienic precautions may be all that is required. This would involve careful handwashing with soap and water after physical contact with the MRSA-colonised patient, and before leaving the person's room, if they are in a nursing home, or their house, if they are in the community.

Disposable gloves should be worn if any carer or relative is going to be in contact with body fluids or dressings. Hands should be washed after removing the gloves. Clothing, bed linen and the patients' environment should be cleansed routinely and when soiled with body fluids, using standard detergents.

Colonised or infected residents of a nursing home should not be placed in rooms with debilitated, non-ambulatory residents, as these patients are at greater risk of becoming colonised and infected with MRSA. Patients shedding large numbers of bacteria due to large wounds not contained by dressings may need to be isolated in a nursing home.

Patients with chronic leg ulcers should have their wounds swabbed to identify if they are carrying MRSA. In some cases the MRSA may be colonising the wound but may not be responsible for any obvious underlying clinical infection. Therefore, even in the presence of MRSA, good wound care...
with topical antiseptics, elevation and compression when indicated, should help to heal the wound.

If there is obvious clinical infection, such as pain, erythema and swelling, the patient may respond to high dose oral or systemic flucloxicillin even though the wound is colonised with MRSA. However, it is important to identify MRSA in the wound to protect healthcare workers, other residents in a nursing home, and family members from getting contaminated and spreading the MRSA to other people.

**Streptococci infections**

**Erysipelas**

Erysipelas is a deeper infection than impetigo, usually affecting the superficial dermis. It usually develops suddenly with redness, swelling and tenderness in the affected area. It spreads out rapidly from the original site, which is often a small area of broken skin as a result of a small patch of localised eczema (see Figure 3).

The patient often feels feverish and has flu-like symptoms and perhaps a low-grade temperature. The rash usually has a palpable edge, and the face and lower legs are the most common sites infected. It is most commonly caused by beta haemolytic streptococcus and responds to high dose oral or systemic penicillin (benzyl penicillin IM or IV or oral penicillin V in high doses).

Since the infection is deep-seated, topical antibiotics and swabs are usually unhelpful. Rest and elevation are important, particularly if the lower limb is involved. Again, all patients should be checked for diabetes. Erythromycin can be used in high doses for patients who are allergic to penicillin.

**Cellulitis**

Cellulitis causes a similar but deeper and more diffuse infection of the lower dermis than erysipelas. Again, the patient usually presents with a painful, red or swollen rash, which can spread rapidly.

The patient may have a low-grade fever and flu-like symptoms. It often involves the lower leg, and a leg ulcer or a break in the skin from a fungal infection of the feet can be the portal of entry for the streptococcus.

Treatment is the same as erysipelas, with high-dose penicillin V. However, cellulitis can sometimes be caused by staphylococcus aureus and so in severe infections it may be necessary to combine penicillin V and flucloxacillin orally in high doses, or admit the patient for systemic antibiotics. (erythromycin can be used if penicillin-allergic).

**Summary**

Superficial bacterial infections such as impetigo and folliculitis are usually caused by staph aureus and respond to flucloxacillin. Deeper infections such as cellulitis are caused by beta haemolytic streptococci and usually respond to penicillin V.

More severe infections may need a combination of penicillin V and flucloxacillin at high doses orally or systemically. All patients with skin infections should be screened for diabetes and patients with unresponsive or chronic infections should be screened for MRSA.

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