Infections and infestations of the skin

Helen Goodyear

Abstract

Childhood skin infections and infestations are common clinical conditions which present to paediatricians, GPs and specialist nurses. Diagnosis of these conditions is often based on history and clinical findings but can be aided by skin swabs for culture and/or virology, skin scrapings, plucked hair or nail clippings for fungal culture and by skin biopsies. It is important to ensure accurate diagnosis to prevent complications and avoid unnecessary investigations or procedures. If doubt exists then children should be referred to a paediatric dermatologist. Treatment of complex skin infections or immunocompromised children should always be undertaken following the advice of a paediatric infectious disease consultant.

Keywords cellulitis; impetigo; lice infestations; molluscum contagiosum; scabies; simplex virus; staphylococcal skin infections; tinea; warts

Bacterial infections

Impetigo (Figure 1)

Impetigo is the commonest skin infection and is a contagious superficial bacterial infection most prevalent in young children. It spreads rapidly either following direct human contact or following contact with clothing, bedding or towels of an infected person. Factors enhancing transmission include warmth, humidity and poor hygiene.

Minor skin trauma e.g. scratches and insect bites often precede primary infection whilst secondary infection occurs due to an underlying dermatosis such as eczema and scabies. *Staphylococcus aureus* (most commonly) and/or *Streptococcus pyogenes* are the usual causes in immunocompetent children.

Non-bullous impetigo: this accounts for around two thirds of cases. Lesions start as small red macules and evolve to vesicles or pustules followed by superficial erosions. Typically, golden yellowish-brown or honey-coloured crust is on the surface. Individual lesions are 1–2 cm with satellite lesions due to rapid spread to surrounding skin and affect the face, around the nose and mouth, and extremities. Lesions heal without scarring.

Bullous impetigo: characteristically, larger tense bullae or blisters (around 5 cm) affect the face, buttocks, trunk and perineum. These rupture leaving shiny erythematous lesions, typically surrounded by a collarette of scale. Systemic symptoms may be present especially in neonates such as diarrhoea, pyrexia and malaise. Bullous impetigo is due to a toxin producing strain of *Staphylococcus*. Infection is localised and *Staphylococcus* can usually be cultured from blister contents. This contrasts to the typically sterile contents of blisters in Staphylococcal scalded skin syndrome.

Diagnosis and management: diagnosis is essentially a clinical one. However swabs should be taken in extensive, severe or recurrent infection from exudate beneath crusts or intact bulla fluid. The differential diagnosis includes herpes simplex virus infection, herpes zoster, insect bites, burns, tinea corporis and rare blistering disorders e.g. bullous pemphigoid.

Treatment aims to resolve soreness, the unsightly appearance of lesions, stop recurrence and prevent spread to other people. Hygiene measures include washing affected areas, soaking off crusts, handwashing and not sharing towels, flannels, bedding or bath water. There is little evidence for topical disinfectant use e.g. povidone–iodine and chlorhexidine. Antibiotics are usually given for 7 days. Topical antibiotics for localised lesions include neomycin, bacitracin, polymyxin B, gentamycin, fusidic acid, mupirocin and retapamulin. Mupirocin and fusidic acid are considered the most effective. However, bacterial resistance may develop especially with repeated use and sensitisation to one of the constituents can result in an allergic contact dermatitis. Systemic antibiotics include penicillin, flucloxacillin, amoxicillin/clavulanic acid, clarithromycin/erythromycin and cephalexin. Selection of systemic antibiotic is determined by the likely organism, local resistance patterns, patients' allergy or intolerance, and bacterial sensitivity when known. It is important to note that erythromycin resistance is increasing and some infections are due to MRSA.

In recurrent infections, it is helpful to take nasal swabs from the patient and family members looking for *Staphylococcal* colonisation. Positive cases require 5 days of treatment with Mupirocin nasal ointment to eliminate carriage and prevent recurrence.

Children with impetigo should not go to nursery or school until blisters and crusting have resolved. Useful patient information leaflets on impetigo are available from NHS clinical knowledge summaries and the British Association of Dermatologists.

Complications: these are rare but include local and systemic spread of infection resulting in cellulitis, lymphangitis or septicaemia. Non-infectious complications of *Streptococcal* infection include guttate psoriasis and glomerulonephritis appearing 1–3 weeks after an infection. Toxin mediated complications such as toxic shock syndrome, staphylococcal scalded skin syndrome and scarlet fever should be considered but fortunately are very uncommon. In children with underlying immune deficiencies, osteomyelitis, arthritis and pneumonia can occur.

Staphylococcal scalded skin syndrome (SSSS)

This is a disease of early childhood with the vast majority of cases being in those of less than 5 years. There is sudden onset of high fever, skin tenderness and erythema. Flaccid blisters and erosions develop within 24–48 hours. Nikolsky's sign is positive with rubbing causing easy disruption of the skin and denuded areas. Conjunctival inflammation and lip involvement may be present. In some cases, skin erythroderma and final desquamation are present but bullae do not occur. The diagnosis is a

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Figure 1 Impetigo — lesions were bullous but have burst leaving erythematous lesions surrounded by a collarette of scale.

clinical one as this is due to a toxin producing strain of *Staphylococcus* and skin swabs are typically negative. Treatment is with intravenous antibiotics, fluid management and supportive care. As erosions are superficial, SSSS usually heals without scarring.

Cellulitis

This occurs due to skin barrier breakdown e.g. an insect bite and is characterised by spreading erythema, warmth and oedema. It is commonest on the face and extremities. In immunocompetent children, *Staphylococcus* and *Streptococcus* are the usual causative agents. Usual treatment is with systemic antibiotics such as flucloxacillin for 7—10 days. Only a minority will need hospital admission. Erysipelas describes cellulitis due to *Streptococcus* characterised by marked erythema and a firm indurated advancing edge.

Perianal *Streptococcal* dermatitis

The peak incidence of this condition is at 3—4 years of age. Symptoms include pruritus ani, painful defaecation, rectal bleeding and encopresis. Erythema extends away from the anal margin and satellite lesions are often present. A 10 day course of oral penicillin V is the treatment of choice, although longer courses may be needed for recurrences.

Erythrasma

This is mild chronic superficial infection of the skin due to *Corynebacterium minutissimum* which is commoner in warm humid climates. Reddish-brown scaly patches are present in intertriginous areas. Treatment is with topical and systemic antibiotics including erythromycin, clindamycin and tetracyclines. Differential diagnosis includes dermatophyte infections.

Cutaneous mycobacterial infection

Lupus vulgaris is rare in children. Reddish-brown plaques affect the head, face and extremities and are usually due to haematogenous or lymphatic seeding. Early haematogenous spread is associated with small blue/purple papules which come in crops with central nodules of semitranslucent "apple jelly". They can resemble chickenpox in appearance. A skin biopsy will be needed. Lesions respond quickly to TB medication but will heal eventually untreated leaving small pit-like scars. Atypical mycobacterial skin infections present as non healing lesions and relevant history and a high index of suspicion are needed for diagnosis.

Leprosy

This is due to *Mycobacterium leprae*. Tuberculoid leprosy presents as hypopigmented patches in dark skins and coppery coloured ones in light skins with a tendency to central healing. Peripheral nerves can be thickened, painful and loss of sensation may be present. In lepromatous leprosy there may be plaques, nodules and papules some of which ulcerate. Skin biopsy is needed and treatment supervised by a paediatric infectious disease consultant.

Viral infections

Warts

These are due to human papillomavirus. Typically on the hands and feet (plantar warts or verrucas), they can occur at any site. Although warts resolve spontaneously, they can last for many years. They are pink, light brown or yellow slightly elevated, flat-topped papules and vary in size from 0.1 to 0.5 cm and can be few or numerous. A line of flat warts may appear as a result of scratching and showing the Koebner phenomenon.

The mainstay of treatment is salicylic acid-based wart paints. Daily treatment is vital to achieve good outcomes. Warts should be soaked to get the skin soft, the wart rubbed down with a cardboard emery board or pumice stone and then wart paint applied. Up to 3 months treatment may be needed. Freezing with liquid nitrogen is effective but may require multiple treatments and is poorly tolerated in young children.

Perianal warts

In children under the age of 2 years these are usually innocently acquired but all cases should have a review and sexual abuse must be considered. If warts are single and well away from the anus then they are best not treated. If they are multiple, spreading or interfering with defaecation then treatment is needed. Imiquimod 5% cream (unlicensed use) is the easiest treatment and is applied three times weekly at night ensuring normal skin in protected.

Molluscum contagiosum ("water warts") (Figure 2)

This is a benign self-limiting viral infection. It is common, found worldwide and typically affects children aged two to five years. Infection requires close human contact and possibly spreads due to fomites such as towels. Children with molluscum should not be excluded from school or sporting activities. Molluscum found in young children's genital area are usually due to auto-inoculation whilst sexual transmission is commonest in adolescents. Children with atopic eczema and immunocompromised children are prone to molluscum as cell-mediated immunity is important to control and eliminate the virus.

Lesions are characteristically discrete, flesh-coloured, dome-shaped papules with central umbilication. They tend to be 2—5 mm in size but range from 0.1 to >1 cm with giant lesions more commonly seen in the immunocompromised. There can be just