Managing outbreaks of scarlet fever

Keywords: Scarlet fever/Group A Streptococcus/Outbreaks

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In winter 2013-14 England and Wales saw an unprecedented number of cases of scarlet fever in the community. Also referred to as scarletina, the disease is caused by group A streptococcus, bacteria carried on the skin and in the nose and throat. The bacteria is present in 5-30% of the population without causing any symptoms and children have a higher rate of carriage than adults. The bacteria can be transmitted from person to person by direct contact or in respiratory droplets, often with no ill effects. For individuals who are symptomatic, antibiotic treatment limits symptom duration and reduces complications, while spread can be minimised by prompt antibiotic treatment and simple infection control precautions.

Scarlet fever is an acute illness caused by group A streptococcus (also called GAS, and Streptococcus pyogenes). There are over 120 serotypes of GAS – some are thought to be more virulent (able to cause disease) than others. The bacteria are responsible for a wide spectrum of disease including common skin and soft-tissue infections, such as impetigo and cellulitis, pyoderma and impetigo. They can also cause serious and life-threatening disease such as toxic shock syndrome and necrotising fasciitis. GAS is a commensal bacteria found on the skin, and in the nose and throat. Carriage ranges from 5-30%, with levels in adults being significantly lower than in children (Bisno and Stevens, 2010). This higher rate accounts for most of the disease burden being in children aged 6-12 years (Heymann, 2008); infections are usually evenly distributed among females and males.

Transmission of GAS is person to person via:
» Exposure to saliva or nasal mucous droplets from a patient who is infected or carrier who is asymptomatic; or
» Direct contact with skin and soft tissue infections.
Transmission via contamination of objects is uncommon (Wilks et al, 2003). Spread of GAS within families and other close groups has been well described (Health Protection Agency, 2004).

Scarlet fever is a manifestation of GAS infection. It features a throat infection (many patients have a history of a preceding sore throat or pharyngitis) that produces a toxin; this causes a bright red-pink rash. The rash is punctate, sandpapery to touch and blanches when pressed. The face is usually spared but patients may have flushed cheeks (Fig 1) and a red, slightly swollen “strawberry” tongue (Fig 2). In severe cases patients may also experience pyrexia, nausea and vomiting. During the convalescent period, peeling of the skin on fingers and toes may occur and the strawberry tongue turns white.

Epidemiology
Cases of scarlet fever and invasive GAS disease (an infection associated with the isolation of GAS from a normally sterile body site (HPA, 2004)) usually increase from December to April, with a peak in March/April (Public Health England, 2014). A contributory factor to this may be populations

England and Wales are currently experiencing unusually high rates of scarlet fever so it is vital that health professionals know what to do when someone is infected.
crowding indoors, allowing greater exposure to respiratory droplets (Bisno and Stevens, 2010). There is a cyclical pattern of scarlet fever infections, with peaks in numbers of cases/notifications approximately every four years (PHE, 2014b).

In line with The Health Protection (Notification) Regulations 2010, scarlet fever and invasive GAS disease are notifiable diseases and in England and Wales all registered medical practitioners, irrespective of grade or area of work, have the statutory responsibility to notify the Proper Officer of their local authority when they suspect a patient is affected. Nurses with a diagnostic role are included in this. The Proper Officer is usually an individual in the local health protection team.

Notification can be verbal, written or both. It is advisable to identify local health protection teams and establish how they prefer to receive this information. Notification enables focused surveillance to be undertaken, alerting health protection teams to any increase in cases.

Current situation
Surveillance of scarlet fever in England and Wales during winter 2013-14 saw a substantial rise in the usual levels. Notifications reached a peak during the first two weeks of April this year and have subsequently shown a fluctuating decline. Although this trend is suggestive of an end to the outbreak, the burden of disease remains higher than in previous years. Analysis of notification data has shown males and females have been equally affected and 87% of notifications are reported in children aged under 10 years (PHE, 2014c).

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regions of England (PHE, 2014d).

Management
Diagnosis
Scarlet fever is a clinical diagnosis and treatment should begin when the diagnosis is suspected clinically. To confirm diagnosis, a throat swab sent for culture of GAS is recommended. Confirmation of the diagnosis is best practice and particularly important for two reasons:

» To rule out other childhood infections with similar clinical presentation such as measles, parvovirus B19 (slapped cheek) and glandular fever;

» To investigate suspected linked cases, for example, if several suspected cases attend the same school or nursery.

Recent PHE guidance provides some points for consideration by health protection teams when investigating such incidents (PHE, 2014e).

Treatment
The recommended antibiotic treatment for scarlet fever is a penicillin; this is usually penicillin V or another penicillin, given orally. Penicillins are available as suspensions for younger children. For those who are allergic to penicillin, azithromycin is the antibiotic of choice. If untreated, patients can remain infectious for up to three weeks.

Exclusion
Patients with scarlet fever are highly infectious to others and should be advised to stay away from school, work and social activities for 24 hours after starting appropriate antibiotic therapy (PHE, 2014c).

Advice
To minimise the risk of transmission it is good practice to offer patients and families simple infection control advice including:

» Wash hands regularly;

» Do not share eating or drinking utensils with the infected person;

» Use tissues to cover the mouth and nose if coughing and sneezing;

» Place tissues in the bin immediately after use to prevent contamination (PHE, 2014f).

Complications
Since the advent of antibiotic therapy, short-term and chronic complications arising from scarlet fever are less common. However, if the GAS enters the bloodstream during the acute phase of a GAS pharyngitis or scarlet fever there is potential for complications including, meningitis, endocarditis and osteomyelitis.

Acute rheumatic fever (ARF) is a rare complication of pharyngeal GAS infection and occurs approximately 2-4 weeks after infection. It is characterised by the development of inflammation involving the heart, joints, subcutaneous tissue and the central nervous system. The infection is self-limiting in most cases.

A serious potential consequence of ARF is chronic damage of the heart valves, leaving the patient vulnerable to severe cardiac failure, which is referred to as rheumatic heart disease. This can present days to weeks after a GAS infection. Undiagnosed heart damage caused as a result of infection during childhood can also become evident in older age.

Another uncommon delayed consequence of GAS infection is acute glomerulonephritis. This is when an immune response to GAS infection occurs within 10 days (range 1-5 weeks) of the original infection; in severe cases it is characterised by hypertension, oedema, impaired renal function and haematuria.

Conclusion
Scarlet fever is a common, usually mild and self-limiting disease. Continued vigilance from health professionals while incidence is unusually high, coupled with prompt and effective management of suspected cases, should reduce transmission and contribute to a gradual reduction in spread within the wider community.

References


Public Health England (2014f) Scarlet Fever: Symptoms, Diagnosis and Treatment. tinyurl.com/PHEScarletFeverGuidance


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