

Group A *Streptococcus* (GAS) Infection

What is a GAS infection?

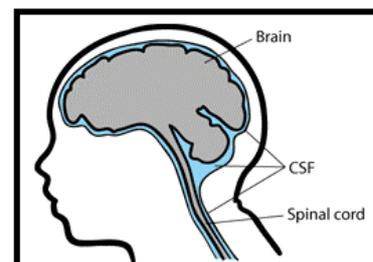
GAS is a bacterium commonly found on the surface of the skin and inside the throat. These bacteria commonly cause mild throat, skin, ear and sinus infections in both adults and children. More rarely these bacteria cause an invasive infection where they penetrate deeper into the tissues and organs of the body causing more serious disease. Examples of invasive disease caused by GAS are septicaemia (infection of the blood), pneumonia (infection of the lungs), puerperal sepsis (infection associated with childbirth), necrotising fasciitis (an infection of the deeper layers of skin more commonly known as flesh eating disease) and osteomyelitis (infection of the bone).

When GAS bacteria invade normally sterile parts of the body they can multiply rapidly and produce poisons. If the bacteria gain access to the deep layers of skin, the poisons produced can lead to destruction of the flesh and gangrene and it may be necessary for an individual to undergo surgery to remove the infection including amputation.

The inflammatory response of the body to poisons produced by GAS can lead to streptococcal toxic shock syndrome (STSS). STSS is a very serious condition with high rates of mortality (varying from 30 to 70%[1]). During the course of STSS a patient develops problems with their circulatory system which in turn leads to organ damage[2]. If left untreated STSS would be fatal.

In rare cases, GAS bacteria can cause meningitis if they gain access to the 'meninges' - the membranes that surround and protect your brain and spinal cord. The meninges are filled with a liquid called cerebrospinal fluid (CSF), which is there to bathe the brain and cushion it against physical damage when you hit your head.

Bacteria can multiply freely in CSF, and there they release poisons, causing inflammation and swelling in the meninges and the brain tissue itself. This increases pressure on the brain, producing symptoms of meningitis such as headache, stiff neck and dislike of bright lights. As the disease



progresses, individuals become drowsy, confused, and delirious. They may have seizures and eventually lose consciousness.

How common is invasive infection by GAS?

Whilst mild illnesses caused by GAS are quite common, invasive infection is much rarer affecting approximately 3 people per in 100,000 in the UK[3].

Incidence of invasive infection due to GAS also fluctuates over time. Severe infections were uncommon in western Europe in the second half of the 20th century but increased during the mid-1980s in Great Britain[4]. It has been speculated that the fluctuation in severity of infections over time may be attributable to natural fluctuation in the types of strains of bacteria in circulation (with some bacterial strains being more invasive than others)[5].

Who gets invasive GAS infection?

Invasive GAS infection is usually isolated in nature (i.e it is very rare to have two cases of invasive disease occur together). However, the bacteria are transmitted from the throat or the skin. School children and those living in close proximity to others, for example in institutions, are more likely to carry and transmit GAS.

Almost one third of those who get invasive disease have no risk factors whatsoever.

However, people with the following problems may be at increased risk of invasive infection by GAS because of breaks in the skin:

- Patients with a recent history of varicella infection (chicken pox)
- Patients who have undergone surgery
- Patients with traumatic injury
- Injecting drug users

Some patients may be at increased risk of infection because of a weakened immune system. For example:

- Patients who used nonsteroidal anti-inflammatory drugs (NSAIDs)
- Patients with HIV, diabetes, cancer, alcohol abuse

What are the after effects?

Severe illness, especially if there has been a long stay in intensive care, can leave the patient feeling weak and tired and much less active and mobile than before. They may also have problems with concentration, memory and attention and find it difficult to do tasks that seemed effortless before they became ill.

The after effects that a patient has will depend on where in the body the GAS infection was. Meningitis can cause neurological damage, ranging from minor problems with coordination and movement or mild learning difficulties, to more disabling problems including deafness and mental impairment. Scarring, amputations and organ damage can result from septicaemia and necrotising fasciitis.

Am I at risk if I have been in contact with someone who has had an invasive GAS infection?

All cases of invasive GAS infection are reported to the Public Health Doctor who will decide what needs to be done to protect the community. In most cases close contacts of the person who had the illness will not need to take preventative antibiotics. However, contacts of cases should be made aware of the signs and symptoms of GAS infection and be vigilant for 30 days after the initial diagnosis was made in the contact case. If in this time period a contact of a case develops any symptoms of GAS infection (i.e. sore throat, fever or skin infection) they should seek medical help immediately[6].

Where can I go for further information and support?

Freephone helpline UK 080 88 00 33 44 Ireland 1800 41 33 444

email helpline@meningitis.org

Visit our website www.meningitis.org

References

1. Stevens, D.L., *Streptococcal toxic-shock syndrome: spectrum of disease, pathogenesis, and new concepts in treatment*. Emerg Infect Dis, 1995. **1**(3): p. 69-78.
2. Schlievert, P.M., A.P. Assimakopoulos, and P.P. Cleary, *Severe invasive group A streptococcal disease: clinical description and mechanisms of pathogenesis*. J Lab Clin Med, 1996. **127**(1): p. 13-22.
3. Lamagni, T.L., et al., *Epidemiology of severe Streptococcus pyogenes disease in Europe*. J Clin Microbiol, 2008. **46**(7): p. 2359-67.

4. *American Academy of Pediatrics. Committee on Infectious Diseases. Severe invasive group A streptococcal infections: a subject review. Pediatrics, 1998. 101(1 Pt 1): p. 136-40.*
5. *Steer, J.A., et al., Guidelines for prevention and control of group A streptococcal infection in acute healthcare and maternity settings in the UK. J Infect, 2012. 64(1): p. 1-18.*
6. *Interim UK guidelines for management of close community contacts of invasive group A streptococcal disease. Commun Dis Public Health, 2004. 7(4): p. 354-61.*