reach

To stop rheumatic heart disease

Can skin sores cause rheumatic fever?

In the 1940s and 1950s researchers noticed that episodes of rheumatic fever (RF) tended to follow outbreaks of sore throat. Many of these observations were made in military barracks or convalescent homes in the United States and the United Kingdom where outbreaks of sore throat were common. Careful study showed that group A streptococcal (GAS) bacterial infections were causing these sore throats and that an abnormal immune response to GAS infection caused RF. This understanding made it possible to describe a 'typical' history of RF symptoms following two - three weeks after a GAS sore throat.

In countries with poor socio-economic conditions, despite a high burden of RF, a classical history of RF following sore throat is less common. This could be because in environments where people are more likely to be affected by other severe illnesses they are less likely, or less able, to seek treatment for a sore throat. It may also be because people who are generally more unwell are less likely to remember having a sore throat when asked. Alternatively, it may be true observation that sore throat does not always precede RF. This could be because historic military studies in developed countries do not represent the reality in developing countries where exposure to GAS is much more common from a very young age.

Some researchers believe that GAS infection of the skin (sometime known as skin sores, pyoderma or impetigo) can also cause the abnormal immune reaction which leads to RF.

There is some evidence for this:

- Some communities, particularly in Aboriginal Australia, have a high burden of skin sores, a low rate of GAS sore throat and high prevalence of RHD.[1]
- This observation supports the idea that streptococcal skin infections, in addition to GAS sore throat infections, may also cause RF - or perhaps make individuals more likely to develop RF following GAS pharyngitis.[2-4]
- GAS skin infections are known to cause other abnormal immune responses including kidney disease (acute post-streptococcal glomerulonephritis)

More research is needed to understand whether skin infections with GAS can cause RF. In the meantime, there are good reasons to include management of skin infections in RF and RHD control programs:

- Skin sores and RF share a number of risk factors, including household overcrowding, poor hygiene and limited access to health services. Interventions to tackle these problems could reasonably be expected to reduce the burden of skin sores, sore throat and RF. Adverse unintended outcomes are unlikely.
- Skin sores, sore throat and RF co-exist in at-risk communities. Providing health services for more than one condition is an example of integrative care which meets the need of people living with multiple conditions and reduces duplication.
- Researchers are working to develop a GAS vaccine. Understanding the burden of all GAS diseases and their consequences (skin sores, sore throat, RF and kidney disease) will be important for countries to decide whether to buy and use a GAS vaccine in the future.

1. McDonald M, Brown A, Edwards T, et al. Apparently contrasting rates of phayrngitis and pyoderma in regions where rheumatic heart disease is highly prevalent. *Heart, Lung and Circulation* 2007; **16**: 254-9.
2. Carapetis J. A review of the technical basis for control of conditions associated with group A streptococcal infection. Geneva, Switzerland WHO, 2005.
3. McDonald M, Towers R, Andrews R, Benger N, Currie B, Carapetis J. Low rates of streptococcal pharyngitis and high rates of pyoderma in Australian Aboriginal communities where acute rheumatic fever is hyperendemic. *Clinical Infections Diseases* 2006; **43**(683-9).
4. Carapetis J, Currie B. Group A streptococcus, pyoderma and rheumatic fever. *The Lancet* 1996; **374**: 1271 - 2.