National Institute for Health and Clinical Excellence: prophylaxis against infective endocarditis

Summary and list of all recommendations on antimicrobial prophylaxis against infective endocarditis in adults and children undergoing interventional procedures – issued March 2008

Adults and children with structural cardiac defects at risk of developing infective endocarditis

Healthcare professionals should regard people with the following cardiac conditions as being at risk of developing infective endocarditis:

• acquired valvular heart disease with stenosis or regurgitation
• valve replacement
• structural congenital heart disease, including surgically corrected or palliated structural conditions, but excluding isolated atrial septal defect, fully repaired ventricular septal defect or fully repaired transposition of the arterial roots, and closure devices that are judged to be endodurable
• previous infective endocarditis
• hypertrophic cardiomyopathy

Patient advice

Healthcare professionals should offer people at risk of infective endocarditis clear and consistent information about prevention, including:

• the need for ongoing antibiotic prophylaxis, and an explanation of why antibiotic prophylaxis is no longer routinely recommended
• the importance of maintaining good oral health
• symptoms that may indicate infective endocarditis and when to seek expert advice
• the risks of undergoing invasive procedures, including non-medical procedures such as body piercing or tattooing

Prophylaxis against infective endocarditis

Antibiotic prophylaxis against infective endocarditis is NOT recommended:

• for people undergoing dental procedures
• for people undergoing non-dental procedures at the following sites:
  – upper and lower gastrointestinal tract
  – genitourinary tract; this includes urological, gynaecological and obstetric procedures, and childbirth
  – upper and lower respiratory tract; this includes ear, nose and throat procedures and bronchoscopy

Chlorhexidine mouthwash should not be offered as prophylaxis against infective endocarditis to people at risk of infective endocarditis undergoing dental procedures.

Infection

Any episodes of infection in people at risk of infective endocarditis should be investigated and treated promptly to reduce the risk of endocarditis developing.

If a person at risk of infective endocarditis is receiving antimicrobial prophylaxis because they are undergoing a gastrointestinal or respiratory procedure, and the surgery is a localized one at a site where there is a suspected infection, the person should receive an antibiotic that causes organisms to that cause infective endocarditis.

Overview

Antimicrobial prophylaxis against infective endocarditis in adults and children undergoing interventional procedures

Interventricular endocarditis (IE) is an inflammation of the endocardium, particularly affecting the heart valves, caused mainly by bacteria, but also by other infectious agents. It is a rare condition, with an annual incidence of fewer than 10 per 100,000 cases in the normal population. Despite advances in diagnos and treatment, IE remains a life-threatening disease with significant mortality (approximately 20%) and morbidity.

The predisposing factors for the development of IE have changed in the past 50 years, mainly with the decreasing incidence of rheumatic heart disease and the increasing impact of prothetic heart valves, nosocomial infection and intraocular drug misuse. However, the potentially serious impact of IE on the individual has not changed (Prendergast 2006).

Published medical literature contains many case reports of IE being provoked by an interventional procedure, most frequently dentistry. IE can be caused by several different organisms, many of which could be transferred into the blood during an interventional procedure. Streptococci, Staphylococcus aureus and enterococci are important causative organisms.

It is accepted that many cases of IE are not caused by interventional procedures (Brunicardi et al. 2006), but with such a serious condition it is reasonable to consider that any cases of IE that can be prevented should be prevented. Consequently, since 1995, antibiotic prophylaxis that aims to prevent endocarditis has been used in at-risk patients. However, the evidence base for the use of antibiotic prophylaxis has relied on extrapolation from animal models of the disease (Pallash 2005) and the applicability of these models to people has been questioned. With a rare but serious condition such as IE, it is difficult to plan and execute research of adequate design and quality to fully explore the question. Consequently, the evidence available in this area is limited, being drawn chiefly from observational (case-control) studies.

Consequently, the evidence available in this area is limited, being drawn chiefly from observational (case-control) studies.

The rationale for prophylaxis against IE in endocarditis usually follows bacteremia, certain interventional procedures cause bacteremia with organisms that can cause endocarditis, these bacteria are usually sensitive to antibiotics; therefore, antibiotics should be given to patients with predisposing heart disease before procedures that may cause bacteremia (Durack 1995).

For prophylaxis to be effective, certain requirements must be fulfilled: identification of patients at risk, identification of the procedures that are liable to provoke bacteremia, and choice of a suitable antibiotic regimen. There should also be a favourable balance between the risks of side-effects from prophylaxis and development of the disease (Moreillon et al. 2004). Underlying these principles is the assumption that antibiotic prophylaxis is effective for the prevention of IE in dental and non-dental procedures. However, many researchers consider this assumption to be not proven (Prendergast 2006), which has led to calls for significantly reducing the use of antibiotic prophylaxis in this setting.

This shift in opinion is reflected in national and international clinical guidelines for prophylaxis against IE. Guidelines used to recommend antibiotic prophylaxis for IE for patients with a wide range of cardiac conditions are set out in the relevant ‘Evidence to recommendations’ sections as transparent as possible, set out in the relevant ‘Evidence to recommendations’ sections.

This clinical guideline aims to provide clear guidance to the NIS in England, Wales and Northern Ireland regarding which dental and non-dental procedures require, or do not require, antimicrobial prophylaxis against IE. In contrast to other recently published national and international guidelines, it explicitly considers the likely cost effectiveness as well as the clinical effectiveness of antibiotic prophylaxis.

In summary, this guideline recommends that antibiotic prophylaxis solely to prevent IE should not be given to people at risk of IE undergoing dental and non-dental procedures. The basis to support this recommendation is:

• there is no consistent association between having an interventional procedure and development of IE
• the clinical effectiveness of antibiotic prophylaxis against IE for dental procedures may lead to a greater number of deaths through fatal anaphylaxis than a strategy of no prophylactic antibiotic, and is not cost effective.

Given the difficulties in relative risk definition, a simple classification of conditions into either groups at risk and not at risk was undertaken.

The full report (CG64 Prophylaxis against infective endocarditis: NICE guidance) and guidance for patients can be seen at: www.nice.org.uk