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 (excluding isolated atrial septal defect) undergoing or necessitating intervention (endocarditis)

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

• acquired valvar heart disease with stenosis or regurgitation
• valvar 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 and functionally, patent arterial septum, and closure devices that are judged to be endofoamatised
• 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 risks of undergoing invasive procedures, including non-medical procedures such as body piercing or tattooing
• the importance of maintaining good oral health
• symptoms that may indicate infective endocarditis and when to seek expert advice
• the tasks 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 urological procedure at a site where there is a suspected infection, the person should receive an antibiotic that covers organisms that cause infective endocarditis.

Overview

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

Infective endocarditis (IE) is an inflammation of the endocardium, particularly affecting the heart valves, caused mainly by bacteria but occasionally 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 diagnosis 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 prosthetic heart valves, nosocomial infection and intra-venous drug misuse. However, the potentially serious impact of IE on the individual who has not changed (Prendergast 2006).

Published medical literature contains many case reports of IE being prevented 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, Staphylococci aureus and enterococci are important causative organisms.

It’s accepted that many cases of IE are not caused by interventions procedures (Briñas et al. 2006), and cannot be prevented by any conventional prophylactic measure. In fact, dental IE is considered to be not proven (Prendergast 2006), which has led to calls to significantly reduce 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 patients with a wide range of cardiac conditions, received for a range of interventional procedures, both dental and non-dental. They now tend to recommend that only those with one of a small number of high-risk cardiac conditions should receive antibiotic prophylaxis when they undergo a limited number of specified dental procedures.

The rationale for prophylaxis against IE is that IE usually follows bacteraemia, certain interventional procedures cause bacteraemia with organisms that can cause endocarditis. These bacteria are usually sensitive to antibiotics, therefore antibiotic prophylaxis should be given to patients with predisposing heart disease before procedures that can cause bacteraemia (Durrack 1995).

For prophylaxis to be effective, certain requirements must be fulfilled: identification of patients at risk, identification of the procedure that is liable to provoke bacteraemia, and choice of a suitable regimen. There should also be a responsible and cost-effective 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 to significantly reduce 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 patients with a wide range of cardiac conditions, received for a range of interventional procedures, both dental and non-dental. They now tend to recommend that only those with one of a small number of high-risk cardiac conditions should receive antibiotic prophylaxis when they undergo a limited number of specified dental procedures.

The recommendations of these four guidelines, and where reported the rationale for their recommendations, have been considered by the GDG in the development of this guideline. However, it should be emphasised that the GDG has based its recommendations on an independent consultation of the available clinical and cost-effectiveness evidence and, where appropriate, expert opinion. The guideline developers have also sought to make the rationale for their recommendations as transparent as possible, set out in the relevant ‘Evidence to recommendations’ sections.

This clinical guideline aims to provide clear guidance to the NICE in England, Wales and Northern Ireland regarding which dental and non-dental interventional procedures require, or do not require, antibiotic 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 (dental or non-dental) and the development of IE

• regular toothbrushing almost certainly presents a greater risk of IE than a single dental procedure because of repetitive exposure to bacteraemia with oral flora

• 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 antibiotic prophylaxis, and is not cost effective.

Given the difficulties in relating risk directly to 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