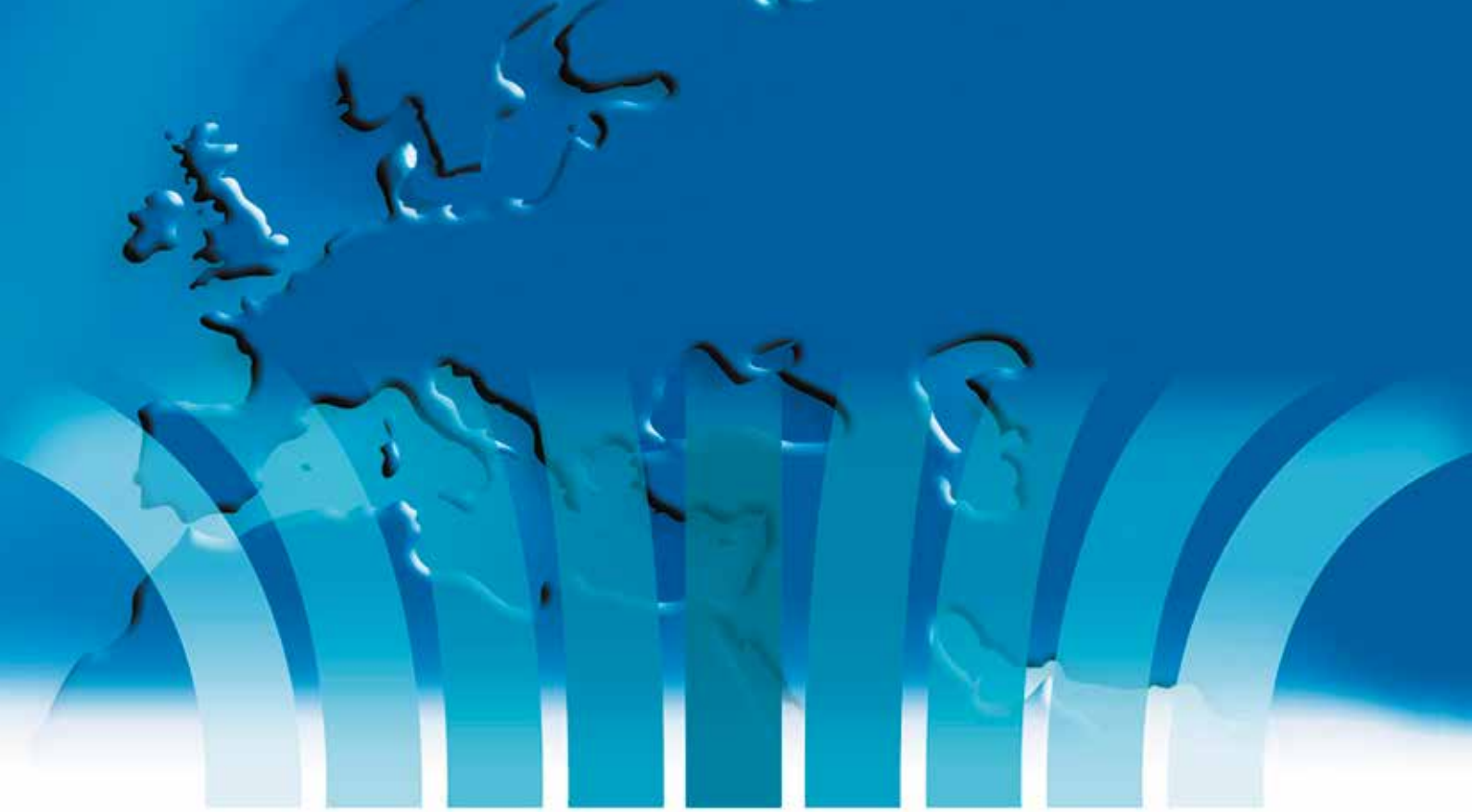

ESSENTIAL MESSAGES FROM ESC GUIDELINES

Committee for Practice Guidelines
To improve the quality of clinical practice and patient care in Europe

INFECTIVE ENDOCARDITIS

2015 ESC GUIDELINES FOR THE MANAGEMENT OF INFECTIVE ENDOCARDITIS

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ESC ESSENTIAL MESSAGES

2015 ESC GUIDELINES FOR THE MANAGEMENT OF INFECTIVE ENDOCARDITIS

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Endorsed by the European Association of Nuclear Medicine (EANM), and the European Association of Cardio-Thoracic Surgery (EACTS)

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European Heart Journal 2015; 36: 3075–3123 - doi/10.1093/eurheartj/ehv319

Take home messages

1. Introduction - Epidemiology

- Infective endocarditis (IE) is a severe form of valve disease still associated with a high mortality (15–30% in-hospital mortality).
- IE is a rare disease, with reported incidences ranging from 3 to 10 cases/100 000 people per year.
- The epidemiological profile of IE has changed over the last few years, with newer predisposing factors – valve prostheses, degenerative valve sclerosis, intravenous drug abuse (IVDA), intracardiac device (CDRIE), associated with the increased use of invasive procedures at risk for bacteremia.
- Health care-associated IE represents up to 30% cases of IE, justifying aseptic measures during venous catheters manipulation and during any invasive procedures.

2. Prevention

- There is a lack of scientific evidence for the efficacy of infective endocarditis prophylaxis. Thus, antibiotic prophylaxis is recommended only for patients with the highest risk of IE undergoing the highest risk dental procedures.
- Good oral hygiene and regular dental review are more important than antibiotic prophylaxis to reduce the risk of IE.
- Aseptic measures are mandatory during venous catheter manipulation and during any invasive procedures in order to reduce the rate of health care-associated IE.
- Although prophylaxis should be restricted to high-risk patients, preventive measures should be maintained or extended to all patients and in particular to those with cardiac disease.

3. The 'Endocarditis Team'

- The presence of an 'Endocarditis Team' is crucial in IE. This multidisciplinary approach has been shown to significantly reduce the 1-year mortality in infective endocarditis.
- A multidisciplinary approach is mandatory, including cardiologists, cardiac surgeons, and specialists of infectious diseases.
- Patients with complicated IE, i.e. endocarditis with HF, abscess, embolic or neurological complication or CHD, should be referred early and managed in a reference centre with immediate surgical facilities.
- Patients with non-complicated IE can be initially managed in a non-reference centre, but with regular communication with the reference centre, consultations with the multidisciplinary 'Endocarditis Team' and, when needed, with external visit to the reference centre.

4. Diagnosis

- Diagnosis of IE is frequently difficult, particularly in some subgroups (prosthetic valve IE [PVE], intracardiac device and blood-culture negative IE [BCNIE]). The Duke criteria are useful for the classification of IE, but they are of limited value in those subgroups.
- Echocardiography and blood cultures are the cornerstone of diagnosis of IE. TTE must be performed first, but both TTE and TEE should ultimately be performed in the majority of cases of suspected or definite IE.
- When the diagnosis remains only possible or even rejected but with a persisting high level of clinical suspicion, echocardiography and blood culture should be repeated, and other imaging techniques should be used, either for diagnosis of cardiac involvement (cardiac CT, ^{18}F-FDG PET/CT or leukocytes-labelled SPECT/CT), or for imaging embolic events (cerebral MRI, whole body CT, and/or PET/CT).

Take home messages

4. Diagnosis (continued)

- These imaging techniques might improve the detection of silent vascular phenomena as well as endocardial lesions and improve the sensitivity of the modified Duke criteria. The ESC 2015 modified diagnostic criteria include these new imaging techniques as new criteria for IE.
- Those new criteria are useful but they do not replace the clinical judgement of the 'Endocarditis Team'.

5. Prognostic assessment at admission

- Prognostic assessment at admission is crucial for the choice of the optimal therapeutic strategy. It can be performed using simple clinical, microbiological, and echocardiographic parameters.
- Once identified, the patients with complicated IE should be referred early and managed in a reference centre with surgical facilities and preferably with an 'Endocarditis Team'.

6. Antimicrobial therapy: principles and methods

- The treatment of IE relies on the combination of prolonged antimicrobial therapy and - in about half patients - surgical eradication of the infected tissues.
- Prolonged therapy with a combination of bactericidal drugs is the basis of IE treatment. Drug treatment of PVE should last longer (at least 6 weeks) than that of native valve endocarditis (NVE) (2–6 weeks).
- The indications and pattern of use of aminoglycosides have changed. They are no longer recommended in staphylococcal NVE because their clinical benefits have not been demonstrated but they can increase renal toxicity; and, when they are indicated in other conditions, aminoglycosides should be given in a single daily dose in order to reduce nephrotoxicity.

7. Main complications of left-sided valve IE and their management

- Early consultation with a cardiac surgeon is recommended in order to determine the best therapeutic approach. Identification of patients requiring early surgery is frequently difficult and is an important scope of the 'Endocarditis Team'.
- Surgical treatment is used in approximately half of patients with IE because of severe complications.
- The three main indications for early surgery in IE are its 3 main complications, i.e. HF, uncontrolled infection, and prevention of embolic events.
- HF is the most frequent and severe complication of IE. Unless severe comorbidity exists, the presence of HF indicates early surgery.
- Uncontrolled infection is most frequently related to perivalvular extension or "difficult-to-treat" organisms. Unless severe comorbidity exists, the presence of locally uncontrolled infection indicates early surgery.
- Embolism is very frequent in IE, complicating 20–50% of cases of IE, falling to 6–21% after initiation of antibiotic therapy.
- The risk of embolism is related to the size and mobility of the vegetation and is the highest during the first two weeks of antibiotic therapy.
- The risk of embolism can be reduced by early initiation of antibiotic therapy and an early surgical strategy, the last only in presence of vegetations with high risk of embolism.

Take home messages

8. Neurological complications

- Symptomatic neurological events develop in 15–30% of all patients with IE and are associated with excess mortality.
- After a first neurological event, if cerebral haemorrhage has been excluded by cranial CT and neurological damage is not severe (i.e. coma), surgery indicated for HF, uncontrolled infection, abscess, or persistent high embolic risk should not be delayed and can be performed with a low neurological risk (3–6%) and good probability of complete neurological recovery.
- Conversely, in cases with intracranial haemorrhage, neurological prognosis is worse and surgery should generally be postponed for at least 1 month.

9. Cardiac devices-related endocarditis

- Cardiac device-related IE (CDRIE) is one of the most difficult forms of IE to diagnose, and must be treated by prolonged antibiotic therapy and device removal.
- Percutaneous extraction is recommended in most patients with CDRIE. Surgical extraction should be considered if percutaneous extraction is incomplete or impossible or when there is associated severe destructive tricuspid IE.
- After device extraction, reassessment of the need for reimplantation is recommended.

Major gaps in evidence

1. The current guidelines are largely based on expert opinion because of the low incidence of the disease, the low number of randomized trials, and the limited number of meta-analyses. Thus, the levels of evidence of current recommendations are low.

2. The microbiological profile in IE is changing and may vary from a country to another. These variations must be taken into account when applying guidelines in a given country.

3. The concept of antibiotic prophylaxis during procedures at-risk is not evidence-based. A randomised controlled trial should be necessary to prove the effectiveness of prophylaxis.

4. The proposed reduction of antibiotic prophylaxis is not evidence-based, but reflects an expert consensus opinion. Additional epidemiological surveys must be done to monitor the potential consequences of guideline modifications on IE epidemiology.

5. The exact role of molecular biology techniques in the diagnosis and management of IE is still to be defined.

6. The place of new imaging techniques (PET-CT) needs further investigations.

7. The optimal duration of antibiotic therapy after surgery for active IE is unclear.

8. Due to the lack of large series, optimal duration of antibiotic therapy in IE due to rare pathogens causing BCNIE is unknown.

9. The effect of early surgery on prognosis is still debated.

10. The indications of surgery after a cerebral event are still debated. Evidence regarding the optimal time interval between stroke and cardiac surgery is conflicting because of lack of controlled studies.

11. The recommendations for the management of the anticoagulant therapy are based on low level of evidence.

12. Data concerning IE in congenital heart disease are scarce and frequently associated with a selection bias.

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