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CLINICAL RESEARCH

Comparison of prognoses of *Staphylococcus aureus* left-sided prosthetic endocarditis and prosthetic endocarditis caused by other pathogens

Comparaison du pronostic des l'endocardites sur prothèse valvulaire à staphylocoque doré et à un autre germe

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KEYWORDS

Infective endocarditis;
Staphylococcus aureus;
Left-sided prosthetic valve;
Prognosis;
Sepsis

Summary

Background. – *Staphylococcus aureus* prosthetic valve endocarditis (SAPIE) is a serious disease. **Aims.** – Our objective was to study the clinical, echocardiographic and prognostic characteristics of left-sided SAPIE, and to compare these characteristics with those of left-sided non-*S. aureus* prosthetic infective endocarditis (NSAPIE) (i.e. left-sided prosthetic infective endocarditis caused by another germ).

Methods. – This was a retrospective analysis of 35 cases of SAPIE among 247 cases of left-sided prosthetic valve endocarditis hospitalized at two university hospitals (Amiens and Marseille, France).

Results. – SAPIE accounted for 14.1% of the cases of left-sided prosthetic valve endocarditis. SAPIE complications included heart failure (in 42.8% of cases), acute renal failure (in 51.4%),

Abbreviations: CI, confidence interval; IE, infective endocarditis; MRSA, methicillin-resistant *Staphylococcus aureus*; NSAPIE, non-*Staphylococcus aureus* prosthetic infective endocarditis (prosthetic infective endocarditis caused by another germ); OR, odds ratio; SAPIE, *Staphylococcus aureus* prosthetic infective endocarditis; TOE, transoesophageal echocardiography; TTE, transthoracic echocardiography.

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sepsis (in 51.4%), neurological events (in 31.4%), systemic embolic event (in 34.2%) and abscess (in 60.0%). In-hospital mortality occurred in 48.5% of SAPIE cases compared with 16% of NSAPIE cases. A comparison of the SAPIE and NSAPIE groups showed a significant difference in terms of 4-year survival ($31.8 \pm 7.3\%$ vs $60.1 \pm 4.1\%$; $P=0.001$). Severe sepsis was the only prognostic factor associated with in-hospital mortality (odds ratio 5.7; $P=0.03$) and long-term mortality (odds ratio 3.7; $P=0.01$) in cases of SAPIE. Sepsis-induced multiple organ dysfunction syndrome was the main cause of in-hospital mortality (70.5%).

Conclusions. — SAPIE is a very serious disease, with elevated in-hospital mortality resulting from sepsis-induced multiple organ dysfunction syndrome. Emergency surgery is recommended in these cases, when possible, before the occurrence of complications, especially severe sepsis.

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MOTS CLÉS

Endocardite infectieuse ;
Staphylococcus aureus ;
Prothèse du cœur gauche ;
Pronostic ;
Sepsis

Résumé

Introduction. — L'endocardite infectieuse sur prothèse à *Staphylococcus aureus* (EIPSA) reste une maladie grave.

Objectifs. — L'objectif est d'étudier les caractéristiques cliniques, échographiques et pronostiques des EIPSA du cœur gauche et de comparer ces caractéristiques aux autres endocardites sur prothèse.

Méthodes. — Il s'agit d'une étude rétrospective analysant les données de 35 EIPSA hospitalisées aux CHU d'Amiens et de Marseille.

Résultats. — EIPSA représente 14,1 % des endocardites sur prothèse. EIPSA se complique dans 42,8 % des cas d'insuffisance cardiaque, 51,4 % d'insuffisance rénale aiguë, 51,4 % de sepsis, 31,4 % d'évènement neurologique, 34,2 % d'embolie systémique et 60,0 % d'abcès périannulaires. La mortalité hospitalière est de 48,5 %, plus élevée que celle des EI sur prothèse non liées au *S. aureus*. La comparaison de survie globale actuarielle à 4 ans montre une différence significative entre le groupe de SAPIE et le groupe des autres endocardites sur prothèse ($31,8 \pm 7,3\%$ vs $60,1 \pm 4,1\%$; $p=0,001$). Le sepsis sévère est le seul facteur pronostique associé à la mortalité hospitalière (OR à 5,7 ; $p=0,03$) et à la mortalité à long cours (OR 3,7 ; $p=0,01$). La défaillance multiviscérale induite par le sepsis est la principale cause de mortalité hospitalière (70,5 %).

Conclusions. — EIPSA est une maladie grave avec une mortalité hospitalière très élevée due dans la majorité des cas à une défaillance multiviscérale induite par le sepsis. Les recommandations européennes conseillent pour ce type d'EI, la réalisation d'une chirurgie urgente sans attendre, si possible, l'apparition des complications.

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Background

Infective endocarditis (IE) is a severe disease, with diagnostic difficulties, changing epidemiology in recent decades and high mortality rates. The incidence of IE ranges from 3 to 10 episodes per 100,000 people per year [1]. The epidemiology of IE has changed significantly in recent years, with the advent of new predisposing factors [2], such as the presence of prosthetic valves or intracardiac materials, haemodialysis, nosocomial infections, immunodeficiency, increased use of injectable treatment and, especially, the aging population with increasing degenerative diseases. These changes have been associated with an increase in infection rates by *Staphylococcus aureus* [1]. In the past, *S. aureus* infective endocarditis was infrequent, accounting for 6.9% of IE in 1931 [3]; these rates have increased steadily from 16% in 1941–1961 [3] to 19–38% currently [2–4]. Despite the progress in antimicrobial therapy, mortality remains high, especially in cases of prosthetic infection [2].

The management of prosthetic IE is complicated, especially in cases of left-sided *S. aureus* prosthetic infective endocarditis (SAPIE). Current guidelines [1,5] on SAPIE are based on only a few studies [6–8], and the indication for surgical treatment is level of proof C. New guidelines from the USA [5] recommend surgery during initial hospitalization for left-sided SAPIE (class IB).

The aims of our work were to determine the clinical and echocardiographic characteristics and prognostic factors of left-sided SAPIE, and to compare these characteristics with those of left-sided non-*S. aureus* prosthetic infective endocarditis (NSAPIE) (i.e. left-sided prosthetic infective endocarditis caused by another germ).

Methods

Between January 1990 and December 2010, 1254 consecutive patients from two French centres (Amiens and Marseille)

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