

# Impact of an Endocarditis Team in the management of 357 Infective Endocarditis

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## Introduction

Despite recent advances in diagnosis and treatment, infective endocarditis (IE) remains associated with a high rate of mortality and morbidity. Since 2015, *European Society of Cardiology* and *American Heart Association* recommend that a multidisciplinary team including cardiologists, surgeons, microbiologists, infectious disease specialists and frequently other specialists should manage complicated IE cases. The diagnostic approach, surgery, antibiotic therapy and type of follow-up should be decided by the team. In our center, since 2011, all IE cases are weekly discussed by an Endocarditis Team during a video conferencing meeting. We present the results of our study.

## Methods

All records for patients admitted to our tertiary care referral center between January 2013 and March 2016 (27 months) with IE (cardiovascular implantable electronic device infections excluded) were prospectively studied by the Endocarditis Team of the three teaching hospitals. We extracted detailed demographic, diagnostic, treatment, and follow-up (in-hospital mortality) data from patients' charts and medical records. We compared characteristics and prognosis between native valve and prosthetic valve IE. Categorical variables are presented as percentages and were compared using the chi-squared test or Fisher's exact test, as appropriate.

## Results

During the study, the Endocarditis Team identified 194 patients with native valve IE (NVE) and 163 patients with prosthetic valve IE (PVE) (Table 1). All patients had transthoracic echocardiograph and 87% of them had transoesophageal echocardiography : vegetation and abscess were present in 67% and 25% respectively. Aortic and mitral valves were infected in 58.3% and 21.8% respectively. Both valves were infected in 9.2% of patients. Computed tomography was performed for 92% of patients. A vascular embolus was found in 60% of patients (cerebral in 49% of cases). A micro-organism was identified in 93% of patients (Figure 1). The most common pathogens were Gram positive cocci. *S. aureus* and coagulase negative staphylococci (CNS) were found to be meticillin resistant respectively in 14% and 61%. All therapeutic strategies (medical and/or surgical treatment) were decided by the Endocarditis Team and a surgical treatment was performed for 47.8% of patients. In-hospital mortality rate was not different between NVE and PVE patients: 14.9% and 14.7% respectively. Exclusive medical treatment (no surgery) and heart failure were associated with higher hospital mortality rates: 23.7% and 30.2% respectively. In-hospital mortality was significantly higher in cases of staphylococci IE (23.8% for all and 29.1% for *S. aureus*) compared to enterococci IE (16.7%) and streptococci IE (9.6%).

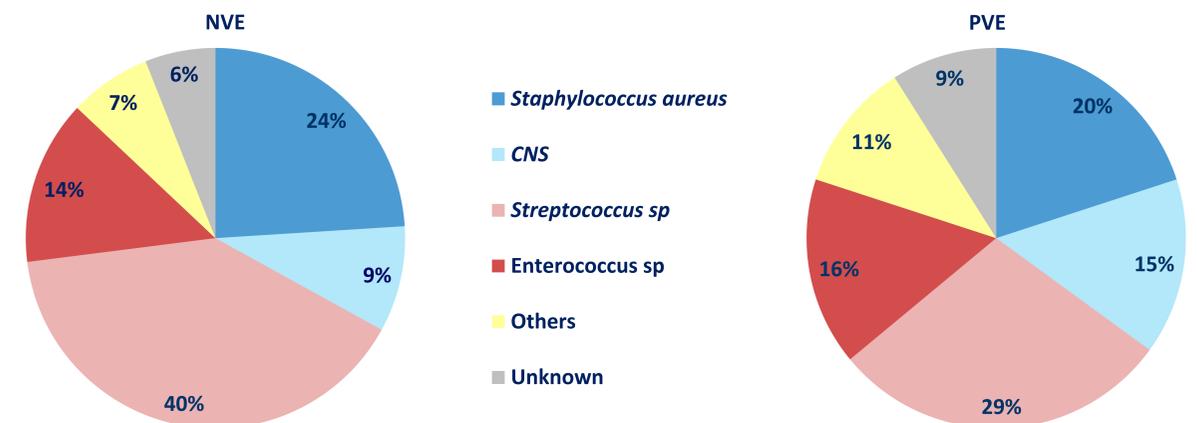
## Conclusion

This study illustrates the change in IE epidemiology with an increase in the trends towards older patients, patients with PVE, and an increasing prevalence of staphylococci. This is likely due in part to an increase in HAIE. Nevertheless, in this study, the IE mortality rate (quite similar between NVE and PVE) is lower than in other studies. We suggest that this difference could be a result of the Endocarditis Team approach since 2011 and is in line with the present guidelines of European and American societies.

Table 1. Epidemiology

		All n=357	NVE n=194	PVE n=163	P
<b>Demographic characteristics</b>	Male, n (%)	261 (73.1)	137 (70.6)	124 (76.1)	NS
	Mean age (years, SD)	64.9 (15.7)	64.0 (14.8)	65.9 (16.6)	0.04
	Electronic device, n (%)	40 (11.2)	20 (10.3)	20 (12.3)	NS
<b>Echocardiographic findings, n (%)</b>	Vegetation	240 (67.2)	147 (75.8)	93 (57.1)	< 0.001
	Abscess	91 (25.5)	32 (16.5)	59 (36.2)	< 0.001
	Aortic valve	208 (58.3)	95 (49.0)	113 (69.3)	< 0.001
	Mitral valve	78 (21.8)	64 (33.0)	14 (8.6)	< 0.001
<b>Microbiology, n (%)</b>	Staphylococci	122 (34.2)	65 (33.5)	57 (35.0)	NS
	Streptococci	125 (35.0)	78 (40.2)	47 (28.8)	0.02
	Enterococci	54 (15.1)	28 (14.4)	26 (15.9)	NS
<b>Outcome, n (%)</b>	Cerebral emboli	102 (28.6)	60 (30.9)	42 (25.8)	NS
	Acute left heart failure	53 (14.8)	38 (19.6)	15 (9.2)	0.006
	Surgical treatment	170 (47.8)	106 (54.6)	62 (38.0)	0.002
	In-hospital mortality	53 (14.8)	29 (14.9)	24 (14.7)	NS

Figure 1. Microbiology



### Abstract (revised)

#### Background:

Infective endocarditis (IE) is a rare disease associated with high mortality despite advances in medical and surgical treatments. Data are limited on changes in the epidemiology of IE in industrialized countries over the past decades. In this study, we report a patient population diagnosed and treated by an Endocarditis Team at Bordeaux University Hospital.

#### Methods:

Between January 2013 and March 2016, we conducted a prospective observational study in the three teaching hospitals of our center (including the cardiac surgery referral unit). Since 2010, members of the multidisciplinary endocarditis team have discussed the weekly management of all IE patients admitted to the center and have extracted detailed demographic, diagnostic, treatment, and follow-up (in-hospital mortality) data from patients' charts and medical records.

#### Results:

Three hundred and fifty-seven patients were included in this study (mean age : 65 years). One hundred and ninety-four patients (54.3%) had native-valve endocarditis (NVE), and 163 (45.7%) had prosthetic-valve endocarditis (PVE). The prevalence of healthcare-associated IE was 45.7%. Forty patients (11.2%) had implantable heart devices. The aortic (58.3%) and mitral (21.8%) valves were most commonly infected; in 9.2% of patients, both valves were infected. The most common pathogens were *Streptococcus* (35.0%), *Staphylococcus aureus* (22.1%), coagulase-negative staphylococci (12.1%), and *Enterococcus* (15.1%). In 7% of IE patients, the pathogens were not documented. More than half of the patients (52.4%) underwent surgical treatment. The in-hospital mortality rate was 14.8% (NVE = 14.9%; PVE = 14.7%, NS) and increased in the absence of surgical treatment (23.7%,  $p < 0.001$ ) or in the presence of heart failure (30.2%,  $p < 0.001$ ) or *Staphylococcus aureus* (29.1%,  $p < 0.001$ ).

#### Conclusion:

The epidemiology of IE has changed considerably as illustrated by our study: older patients, more prosthetic valves and increased prevalence of staphylococcal pathogens. Nevertheless, the mortality rate was lower than in other studies. We suggest that the management of IE by a multidisciplinary endocarditis team as advocated in the latest recommendations could improve the prognosis of this disease.