



Microbiological, Epidemiological and Clinical Characteristics of 60 Cases of Infective Endocarditis in the Last 6 Years in a Teaching Hospital, Rio de Janeiro, Brazil

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BACKGROUND

Infective endocarditis (IE) is relatively uncommon, however, it has received considerable attention by international scientist community. Despite the improvements in medical and surgical therapies, the mortality rate of IE has remained unacceptably high. The aim of this observational, prospective cohort study was to report the microbiological, epidemiological and clinical characteristics of 60 patients diagnosed at a University Hospital located in Rio de Janeiro, Brazil, during the period from June, 2009 to November, 2015

MATERIAL/METHODS

The diagnosis of IE was based on the modified Duke criteria, which was incorporated with medical history, physical examination and echocardiographic data. Patients were classified into two groups: community-associated infective endocarditis (CAIE) and healthcare-associated infective endocarditis (HAIE). All statistical analysis were performed by using Stata® program (version 9.2 StataCorp®). Written informed consent was obtained from all patients, as required by the institutional committee.

RESULTS

The mean age was 47.4 years and 38 (63.3%) patients were male. Of the 60 cases, 26.7% and 73.3% were classified as CAIE and HAIE, respectively. The mean time between the onset of symptoms and the diagnosis of IE was 22.4 days. The most frequent microorganisms were *Staphylococcus aureus* (35.8%), *Enterococcus* spp. (30.2%),

Coagulase-Negative staphylococci (13.2%) and Gram-negative bacilli (13.2%). Seven methicillin-resistant *Staphylococcus aureus* (mecA gene) identified six different sequence type (ST1, ST5, ST25, ST105, ST188 and ST398). Two isolated belonged to known epidemic lineages (USA400 and USA800). *Streptococcus* spp. (37.5%) was the most predominant microorganism in CAIE, whereas in the HAIE group, *Staphylococcus aureus* (39.5%) was the most prevalent. The majority of IE occurred in native valves (83%) and the most involved was the mitral valve (58.6%). Mean vegetation size was 13.8 mm, 14.1 mm in the CAIE group and 13.7 mm in the HAIE group. The overall mortality was 50.8%, being more frequent in patients with HAIE than CAIE (60.5% vs 25% respectively). In the multivariate analysis, we found *Enterococcus* spp. (OR= 12.4; 95% CI= 2.5 – 61.9, $p= 0.002$) and sepsis (OR=18.7; 95% CI=3.1 – 112.4; $p=0.001$) independently associated with mortality.

CONCLUSIONS

We observed a change in IE etiology in Rio de Janeiro, Brazil. Now, HAIE is a new emerging infectious disease and *Enterococcus* spp. is the principal agent of mortality in our cohort of IE patients.

Table 1 - Multivariate Analysis of IE in Mortality

CHARACTERISTIC	OR (95% CI) ¹	<i>p</i> VALUE
<i>Enterococcus</i> spp.	12.4 (2.5 – 61.9)	0.002
Sepsis	18.7 (3.1 – 112.4)	0.001

¹ OR odds ratio; 95% CI Confidence interval

Table 2– Epidemiologic and Clinical Aspects of IE

CHARACTERISTICS	CAIE ¹ N=16 (26.7%)	HAIE ² N=44 (73.3%)	<i>p</i> VALUE
AGE (YEARS, MEAN ± SD)	43.59 ± 22.2	47.86 ± 22.6	0.507
MALE GENDER	11 (68.75 %)	27 (61.4 %)	0.559
LENGTH OF IN-HOSPITAL STAY (DAYS, MEAN ± SD)	30.3 ± 5.5	57.2 ± 6.4	0.032
MICROORGANISM			
<i>Enterococcus</i> spp.	2 (12.5 %)	14 (32.5 %)	0.181
VRE ³	0 (0 %)	5 (11.6 %)	0.180
MRSA ⁴	0 (0 %)	6 (13.9 %)	0.138
MSSA ⁵	1 (6.2 %)	12 (27.3 %)	0.138
Streptococci	6 (37.5 %)	0 (0 %)	0.000
CoNS ⁶	3 (18.7 %)	4 (9.3 %)	0.226
GNB ⁷	1 (6.2 %)	6 (13.9 %)	0.499
Unknown etiology	4 (25 %)	3 (6.9 %)	0.057
VEGETATION SIZE (CM, MEAN ± SD)	1.41 ± 1.9	1.37 ± 1.6	0.899
HEART VALVE COMPROMISED			
Mitral	10 (62.5 %)	24 (57.1 %)	0.711
Aortic	9 (56.2 %)	15 (35.7 %)	0.156
Tricuspid	2 (12.5 %)	6 (14.3%)	0.860
Multiple valve	6 (37.5 %)	5 (11.9 %)	0.408
TYPE OF VALVE			
Native	15 (93.7 %)	34 (79.1 %)	0.182
Mechanic	1 (6.2 %)	6 (13.9 %)	0.416
Biologic	1 (6.2 %)	2 (4.6 %)	0.804
RISK FACTORS			
Rheumatic fever	1 (6.2 %)	4 (9.3 %)	0.708
Congenital cardiopathy	4 (25 %)	4 (9.3 %)	0.117
Mitral valve prolapse	5 (31.2 %)	5 (11.6 %)	0.074
Previous infective endocarditis	2 (12.5 %)	8 (18.6 %)	0.578
Renal failure	1 (6.2 %)	26 (60.5 %)	0.000
Indwelling vascular catheter	0 (0 %)	29 (67.4 %)	0.000
Hemodialysis	0 (0 %)	20 (46.5 %)	0.001
HIV +	1 (6.2 %)	4 (9.3 %)	0.708
Corticotherapy	0 (0 %)	12 (27.9 %)	0.018
Dental procedure	4 (25 %)	2 (4.6 %)	0.022
Manipulation of urinary system	0 (0 %)	3 (6.9 %)	0.278
Heart device	0 (0 %)	2 (4.6 %)	0.380
Previous valve surgery	3 (18.7 %)	5 (11.6 %)	0.499
VALVE REPLACEMENT FOR IE TREATMENT	6 (37.5 %)	43 (72.8 %)	0.274
PREVIOUS ANTIBIOTIC THERAPY	5 (16.7 %)	25 (83.3 %)	0.105
COMPLICATIONS			
Valve abscess	1 (6.2 %)	4 (9.5 %)	0.691
Prosthetic dehiscence	0 (0 %)	1 (2.4 %)	0.374
Splenic infarction	3 (18.7 %)	1 (2.3 %)	0.026
Splenic abscess	1 (6.2 %)	1 (2.3 %)	0.459
Mycotic aneurysm	1 (6.2 %)	3 (6.9 %)	0.804
Septic embolization in central nervous system	2 (12.5 %)	2 (4.8 %)	0.299
Acute renal failure	6 (37.5 %)	9 (20.9 %)	0.212
Chronic renal failure	2 (12.5 %)	1 (2.3 %)	0.120
Sepsis	3 (18.7 %)	13 (30.2 %)	0.378
Septic shock	1 (6.2 %)	10 (23.2 %)	0.136
Heart failure	2 (12.5 %)	1 (2.3 %)	0.114
Cardiogenic shock	1 (6.2 %)	2 (4.6 %)	0.804
IN-HOSPITAL MORTALITY	4 (25 %)	26 (60.5 %)	0.083

¹ CAIE Community-associated Infective Endocarditis; ² HAIE Healthcare-associated Infective Endocarditis; ³ VRE Vancomycin-Resistant *Enterococcus*; ⁴ MRSA Methicillin-Resistant *Staphylococcus aureus*; ⁵ MSSA Methicillin-Sensible *Staphylococcus aureus*; ⁶ CoNS Coagulase-negative *Staphylococci*; ⁷ GNB Gram-negative bacilli.