Abstract: 472

Epidemiology and temporal trends of cardiac device related infective endocarditis

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Background: Infective endocarditis (IE) is a rare, but life-threatening complication of cardiac device implantation. Despite recent preventive strategies, and advances in antimicrobial and surgical treatment, morbidity and mortality rates are still high.

Aims: The objective of our study was to assess the epidemiological characteristics, temporal trends and mortality rate of cardiac device related IE (CDRIE) in our high-volume, tertiary referral center.

Methods: retrospective data collection was performed from January 1, 2006 to December 31, 2016. Thirty-day, 6-month and 1-year mortality was estimated, which were compared to left-sided native valve endocarditis (LSNIE). Patients administered between 2006 and 2010 and between 2011 and 2016 were compared to assess temporal trends.

Results: 465 cases of IE were administered, out of whom 54 patients had CDRIE (39 males [72%], mean age: 55.8 ±19 yrs; 4 VVI, 7 VDD, 7 VVI-ICD, 20 DDD, 5 DDD-ICD and 11 CRT devices; median time since first implantation: 1558 days [IQR: 470 days – 8.6 yrs]). The infection was caused by streptococci in 3 cases (5.5%), Staphylococci were the most prevalent infective agents (70%), S. aureus (SA) in 28 cases (52%, out of whom 10 were MRSA), coagulase negative Staphylococcus in 10 cases (18.5%), blood culture negative cases in 8 patients (15%), and in 5 cases other pathogens were responsible. 266 patients had LSNIE (201 males [75%], mean age: 54.4 ± 15.6 yrs). There was no difference between the two groups in age or in portion of males. Mortality rates were the same in CDRIE group compared to LSNIE group (30-day: 13% vs 13%, 6-month: 20% vs 25%, 1-year: 26% vs 29% and long-term: 44% vs 44%, ns resp.) Patients who died in the CDRIE group (n=25) were older (64 yrs [IQR:59-71 yrs] vs 52 yrs [IQR: 27-69 yrs], p=0.02), male sex was less common (52% vs 79%, p=0.03), had lower ejection fraction (39.6 ±16.6% vs 54.6 ±14.5%, p<0.001), had worse renal function (GFR: 46.3 ± 15.3 vs 60.2 ± 23.5 ml/min/1.73m2, p=0.04), shorter time since first device implantation (2.1 yrs [IQR: 1.1-4.8 yrs] vs 6.7 yrs [4.1-12.9 yrs], p=0.006), and CRT device implantation were more prevalent (32% vs 10%, p<0.05). Patients admitted before 2011 (n=22) did not differ from patients admitted after 2011 (n=32) in terms of age, male gender, concomitant valve infection, pocket infection, or embolic event. The 30-day (0% vs 6%) and the 1-year mortality (18% vs 31%) were the same before and after 2011, but the 6-month mortality was better before 2011 (4.5% vs 31%, p=0.01). CRT device implantation was more prevalent over time (5% vs 31%, p=0.01), and SA infection became more frequent (36% vs 63%, p=0.05)

Conclusions: During the last decade patients with CDRIE had a same survival as patients with LSNIE, every fourth patient died one year after the diagnosis. Almost three-quarter of the infections were caused by Staphylococci, and the portion of S. aureus infection increased over time.