eP102: Characteristics and prognosis of patients with staphylococcal prosthetic vascular graft infection (PVGI): a prospective cohort of 92 patients

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Introduction

Prosthetic vascular graft infection is a rare but devastating complication associated with a high mortality rate (6-50%) and a high rate of amputation (10_30%) [1- 2]. *Staphylococcus aureus* is predominant according to well-documented series, but *S.epidermidis* is an emerging pathogen in this setting [3]. **The aim of this study is to describe the characteristics and prognosis of patient admitted for a staphylococcal PVGI and to assess the existence of any relation between failure (relapse, recurrence or death) and patients' characteristics.**

Materials and Methods

All consecutive patients admitted in our department between January 1, 2000 and August 1, 2013 for a staphylococcal PVGI (n=92) were enrolled in the present prospective cohort study.

PVGIs were divided into extracavitary (femoro-femoral, femoro-popliteal and axillo-femoral) and **cavitary** (aorto-iliac, aorto-femoral, ilio-femoral, aortic) and classified **in early post-operative PVGI** (ie. within 4 months following the intervention) and **late** post-operative PVGI (ie.>4 months).

In the absence of uniform criteria, we used those proposed by Antonios et al. [4]: a patient had definite PVGI if at least two of the following criteria were present:

(a) positive bacterial culture (more than two intra-operative samples for the same bacteria according to the antibiotic susceptibility profile if it came from skin flora like coagulase-negative staphylococci, *Dermabacter* spp., *Corynebacterium* spp. or *Propionibacterium acnes*) of intra-operative or blood sample
(b) Clinical signs of infection [general or, in the area of the prosthesis]
(c) Biological signs of infection or other radiological signs of infection.

PVGI was suspected when bacteraemia occurred in the early postoperative period (within 4 weeks of graft). Non-parametric Wilcoxon rank-sum test and Fisher exact test were used to compare the patients' baseline characteristics.

Table 1: baseline characteristics (n ; %)

			p
	Death		
COP	No	Yes	
No	59 (88)	8 (12)	**0.03**
Yes	17 (68)	8 (32)	
Artérial aneurysm			
No	54 (92)	5 (8)	**0.01**
Yes	22 (67)	11 (33)	
Extrarenal epuration in ICU			
No	80(91)	8 (9)	**0.03**
Yes	2(50)	2 (50)	
Cavitary PVGI			
No	38 (95)	2 (5)	**<0.01**
Yes	38 (73)	14 (27)	
Fever			
No	29 (100)	0	**0.06**
Yes	46 (74)	16 (26)	
Rifampicin Use			
No	28 (70)	12 (30)	**0.01**
Yes	48 (92)	4 (8)	
Age (median ; IQR)	56 [62-73]	63 [55-74]	**0.01**
	Recurrence		
Artérial aneurysm	No	Yes	
No	50 (25)	9 (15)	**0.03**
Yes	32 (97)	3 (1)	
Cavitary PVGI			
No	31 (78)	9 (22)	**0.01**
Yes	51 (98)	1 (2)	
Fever			
No	23 (79)	6 (21)	**0.06**
Yes	58 (94)	4 (7)	
CNS			
No	63 (93)	5 (7)	**0.07**
Yes	19 (79)	5 (21)	

Results

92 patients (79 males; 86%) of mean age 64.5 years [IQR: 58-76] admitted for staphylococci PVGI were included. 52 patients had a cavitary PVGI (57%), 44 cases had early post-operative infection (48 %) and nine patient had suspected PVGI (10%). The most frequent co-morbidities were hypertension (n=72), coronary arterial disease (n=51), diabetes mellitus (n=27), chronic obstructive pulmonary (COP) (n=22) and 18% of them were obese. Bacterial cultures were obtained from intra-operative samples in 53 patients, from blood samples in 15 patients (18%) and from both in 21 patients (25 %) . Methicillin-susceptible *S. aureus* (MSSA) was the predominant pathogen (n=53), followed by coagulase negative staphylococci (CNS) (n=24), methicillin-resistant *S. aureus* (MRSA) (n=20), *Streptococcus* spp. (n=6), enterobacteriaceae (n=15) and strict anaerobes (n=3); PVGI was polymicrobial in 23 patients (25%). Surgery was performed in 78 patients (85%), with replacement of the infected implants in 48 (52.2%) of them by autologous vein (n = 13), new prosthesis (n = 8) or allograft/homo- graft (n = 27), and débridement of infected tissue in 30 (32.6%) other patients. Fourteen patients (15.2%) could not be operated due to their conditions and were treated with a medical approach. During a median follow-up of 14.7 months [IQR: 6-25], 26 patients (28%) relapsed and 30 patients (32.6%) died in relation with PGVI for 16 of them . Patients with cavitary PGVIs had a higher mortality rate (p<0.01) but less recurrence of PGVIs (p=0.01). In univariate analysis, mortality was associated with age (p=0.01), fever at admission (p=0.06), , extrarenal epuration (p=0.03) and COP (p =0.03). Rifampicin use was associated with a higher clinical success rate (p=0.01). Patients with MRSA-related PGVI had a similar clinical outcome than those with MSSA-related PGVI (p=0.4). A trend towards a higher risk of relapsing PGVI was observed in patients with CNS related PGVI (p=0.07). Of note, retention of the infected implants was associated with a clinical success rate similar to that observed in case of replacement of the infected implants (p=0.5).

Characteristics associated with failure are summarized in table 1.

Conclusions

Our results suggest that treatment failure of staphylococcal PVGI depends on the site of infection and on clinical presentation at admission with a better prognosis recorded in patients with extra-cavitary PVGI or without sepsis. MRSA-related PVGI and retention of the infected implants did not seem to impact the outcome of our patients. The use of Rifampicin combinations in the majority of our patients and the apparent benefit of rifampicine use in this setting may explain these results as it has previously been shown for staphylococcal prosthetic joint infections [5-6]

References

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