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BACKGROUND

- It is expected that parallel to the rise in the number of primary arthroplasties an increase occurs in the number of revision prosthesis implants, and therefore in the number of infections (1).
- On the other hand, a higher incidence of infection is reported in revision prosthesis (RP) than in primary prosthesis (PP) (2).
- The incidence of postsurgical primary prosthesis joint infection (PPJI) was 1.1% and for revision prosthesis (RPJI) 10.8% (range 0-33%) in Andalucía (Spain) over the last year.

OBJECTIVES

- We aim to identify the features of patients with RPJI, the etiology and resistance profiles, and the risk factors in order to develop preventive strategies and evaluate if management needs to be changed.

METHODS

- For the study of risk factors for RPJI, we used a prospective cohort of all patients operated on for revision knee and hip arthroplasty in 8 Andalusian hospitals between March 2013-October 2014, for whom active surveillance of infections was conducted. Epidemiological features, peri-operative variables and surgical wound status during admission and at discharge were recorded.
- For the clinical and microbiological characterization of patients with RPJI, the SAEI/GIOSTAR cohort of patients with PJI (2006-2011) were also used; patients with PPJI and those with RPJI were compared.
- PJI was defined by standard criteria.
- Early postsurgical PJI was defined as that occurring within the first 30 days of prosthesis implantation.
- Chi-square test was used to compare features of primary and revision PJI. Logistic regression was used to estimate risk factors associated with RPJI.

RESULTS

- Between March 2013-October 2014, 3663 arthroplasties were reviewed; 3357 were primaries [36 (1.1%) infected], and 306 (8.4%) were revisions [33 (10.8%) infected] (122 total hips, 14 partial hips, 169 knees).

Risk factors associated to revision prosthesis joint infection			
Univariate analysis			
Variable		N (%)	p
Sex	Male	18 (18.9)	0.002
	Woman	15 (7.2)	
Prosthesis location	Total hip	22 (18)	0.004
	Partial hip	1 (7)	
	Total knee	10 (6.9)	
Chronic bronchopathy	Yes	6 (28.6)	0.04
	No	24 (11.9)	
Immunosuppression	Yes	3 (43)	0.06
	No	27 (13)	
ASA score	1-2	8 (12)	0.004
	3-4	24 (64.4)	
Antibiotic prophylaxis*	Cefazoline	3 (43)	0.2
	Cefazoline + AG or glycopeptid	27 (13)	
Heavy wound bleeding	Yes	12 (35.3)	0.001
	No	18 (10.3)	
Wound drainage at discharge	Yes	8 (32%)	<0.001
	No	22 (8)	
Wound dehiscence at discharge	Yes	2 (100)	<0.001
	No	28 (9.3)	

*Only 110 patients were included. AG: aminoglycosides

Multivariate analysis		
Variable	OR (CI 95%)	p
Total hip prosthesis	4,5 (1,8-11,2)	0,001
Heavy wound bleeding	4,9 (1,9-12,4)	0,001
ASA score ≥4	16,8 (1,2-230,8)	0,03

Area under the ROC curve: 0.75 (CI 95% 0.66-0.85)

349 PJI were compared; 264 PPJI and 85 RPJI from:

- a. SAEI/GIOSTAR cohort (2006-2011): 228 PPJI + 52 (18.6%) RPJI
- b. Prospective cohort (2013-2014): 36 PPJI + 33 (47.8%) RPJI

Differential characteristics of patients with primary and revision prosthesis joint infection

	Primary prosthesis n=264 (%)	Revision prosthesis n=85 (%)	p
Sex: male	101 (38.3)	50 (58.8)	<0.001
Obesity	42 (15.9)	26 (30.6)	0.003
Total hip prosthesis	74 (28)	40 (47.1)	0.001
Wound bleeding	34 (12.9)	24 (28.2)	<0.001
Early infection (<30 days)	96 (36.4)	13 (15.3)	<0.001
Etiology			
-S. aureus	66 (25)	18 (21.1)	0.4
-CNS	61 (23.1)	25 (29.4)	0.2
Multidrug-resistant	7 (11.3)	8 (32)	0.02
-Gram-negative bacilli	21 (8)	16 (18.8)	0.004
-Estreptococcus	19 (7.2)	4 (4.7)	0.4
-Polymicrobial	28 (10.6)	8 (9.4)	0.7
-Negative culture	28 (10.6)	4 (4.7)	0.1
Surgical management			
-Debridement	127 (50.8)	39 (52.7)	0.7
-Exchange	99 (39.6)	24 (32.4)	0.3
-Resection	22 (8.8)	14 (18.9)	0.01

CNS: coagulase-negative staphylococci

CONCLUSIONS

- In this case series, RPJI were 10 times more frequent than PPJI, and increasing in the last year.
- Since gram-negative bacilli and multidrug-resistant CNS infections were more frequent, we should consider changing surgical prophylaxis for revision procedures.
- These patients must be considered high risk, and would require close monitoring, mainly those with THP, with SWB and high ASA score.

1. Kurtz et al. J Bone Joint Surg Am 2007;89:780-5.
 2. Barbari EF et al, Clin Infect Dis 2010;50:8-16.