Streptococcal Periprosthetic Joint Infections: Prognosis and Outcomes

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INTRODUCTION:

Streptococcus species is a common pathogen family in periprosthetic joint infection (PJI); however, few studies have focused on the microbe-specific outcome of these infections. This study aims to analyze the clinical presentations and outcomes compared to other common causes of PJI.

METHODS:

Retrospective review of a single institution's PJI database identified 54 cases (21 hips, 33 knees) of streptococcal PJI. Infection clearance was defined as no surgical treatment for reinfection or suppressive antibiotic therapy (SAT). Patient demographics, treatment regimen, and outcomes were collected for a minimum of 1 year from index PJI surgery. Statistical analysis was performed with RStudio version 1.1.463 (R Foundation, Vienna, Austria).

RESULTS:

The cohort was 68.5% male with mean age of 68.0 years (SD: 8.9) with a mean Elixhauser Comorbidity score of 7.4 (SD: 4.4). 38.9% of patients had diabetes mellitus type II. The most common species isolated was Group B Streptococcus (GBS) (n=23, 42.6%). Surgical treatment for PJI included DAIR (n=30), 1-stage exchange (n=3), 2-stage exchange (n=18), and resection arthroplasty/amputation (n=3) without any significant differences for infection clearance between groups. Overall, 51.9% of patients were cleared of their infection at 1 year. At the time of final follow-up treatment failures included 12/54 (22.2%) patients who required surgery for reinfection, 9/56 (23.3%) patients on SAT, and 2/56 (3.6%) patients who died before their 1-year postoperative follow-up. Overall, the estimated 5-year survival rate for streptococcal PJI was 0.66 [95% CI: 0.49-0.89].

DISCUSSION AND CONCLUSION:

Treatment success in streptococcal PJI infections was suboptimal with only slightly more than 50% of patients clearing their infection at 1-year. The lower rate of treatment success in this cohort may suggest that *Streptococcus* may be more difficult to eradicate than previously thought.

Table 1. Clinical and Laboratory Characteristics

	Total	Failed Infection Clearance at One-Year	Infection Clearance at One-Year	p-value
	n=54	n=26	n=28	
Affected joint, n (%)				1.000
Hip	21 (38.9)	10 (38.5)	11 (39.3)	
Knee	33 (61.1)	16 (61.5)	17 (60.7)	
Presenting symptoms, n (%)				
Pain	43 (79.6)	21 (80.8)	22 (78.6)	1.000
Drainage	11 (20.4)	7 (26.9)	4 (14.3)	0.416
Fevers, chills, night sweats	25 (46.4)	13 (50.0)	12 (42.9)	0.785
Swelling, effusion	21 (38.9)	7 (26.9)	14 (50.0)	0.101
Fatigue, malaise	3 (5.6)	2 (7.7)	1 (3.6)	0.604
PJI Classification, n (%)				0.330
Acute	29 (53.7)	17 (65.4)	12 (42.9)	
Acute hematogenous	19 (35.2)	7 (26.9)	12 (42.9)	
Chronic	6 (11.1)	2 (7.7)	4 (14.3)	
# of Prior Surgeries, median [IQR]				
Aseptic	1 [1-2]	2 [1.3-2]	1 [1-1]	0.029**
Septic	2 [1-3]	2 [1-3]	2 [1-3]	0.750
Time between most recent surgery and streptococcal PJI (days), median [IQR]	707.5 [118-2,919.3]	379.0 [90.3-1,057.3]	1,662.0[181.5-3,430.3]	0.093
Prior PJI, n (%)	17 (31.5)	9 (34.6)	8 (28.6)	0.771
Prior Streptococcal PJI, n (%)	4 (7.4)	2 (7.7)	2 (7.1)	1.000
Surgical Treatment				0.145
DAIR	30 (55.6)	16 (61.5)	14 (50.0)	
1-stage revision	3 (5.6)	3 (11.5)	0 (0.0)	
2-stage revision	18 (33.3)	6 (23.1)	12 (42.9)	
Resection arthroplasty/amputation	3 (5.6)	1 (3.8)	2 (7.1)	
Antibiotic Treatment				
# requiring SAT	13 (24.1)	13 (50.0)	0 (0.0)	<0.001**
Laboratory Findings, median [IQR]				
Serum ESR	49.0 [30.5-85]	52 [38-91]	46 [30-69.5]	0.448
Serum CRP	20.4 [10-26.3]	20.0 [10.9-26.3]	21.0 [9.4-25.7]	0.938