Sex-Specific Analysis of Clinical Features and Outcomes in Staphylococcal Periprosthetic Joint Infections Managed with Two-Stage Exchange Arthroplasty

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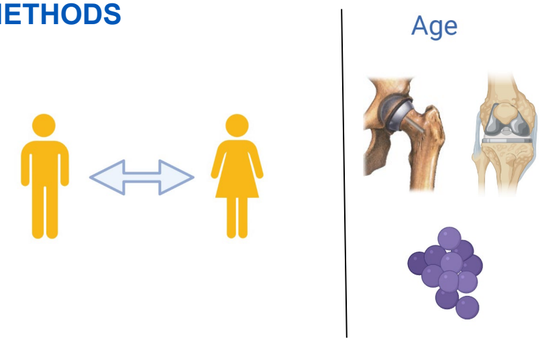
BACKGROUND

- There are inherent differences between susceptibility and response to infection between males and females [1]. Despite this, sex specific analyses are under-reported in medical literature and there is a paucity of literature looking at differences between males and females in terms of prosthetic joint infection.
- Females have a higher prevalence of osteoarthritis, may present at a later stage of disease[2] and are less likely to be referred to specialist care [3]. Higher rates of prosthetic joint infection have been reported in men [4].
- There are anatomical, pharmacokinetic, and joint biomechanical differences between males and females. Whether these differences result in differing presentation, treatment tolerability and outcomes in prosthetic joint infection has not been widely evaluated.

RESEARCH QUESTION

Are there differences in presentation, treatment and outcome of PJI between males and females

METHODS



Males and females treated with two stage exchange for staphylococcal PJI were retrospectively matched for age, joint involved and causative organism

RESULTS

Table 1. Baseline Characteristics

	N	Male (N=78)	Female (N=78)	P value
Age at presentation (years)	156	68.4 (60.1-74.3)	67.8 (60.9-74.1)	0.967[1]
Joint Affected Hip Knee	156	 38 (48.7%) 40 (51.3%)	 38 (48.7%) 40 (51.3)	1.000[2]
Causative Organism *Staphylococcus aureus* Coagulase Negative Staphylococcus	156	 24 (30.8%) 54 (69.2%)	 24 (30.8%) 54 (69.2%)	1.000[2]
BMI	151	31.7 (28.9-36.8)	33.0 (27.2-39.0)	0.938[1]
Charlson Comorbidity Index	154	3 (2-4)	3 (2-4)	0.845[1]
Penicillin Allergy	156	6 (7.7%)	10 (12.8%)	0.291[2]
Chronic Immunosuppressive therapy (>30 days)	148	3 (4.0%)	12 (16.4%)	0.012[2]
White blood cell count ($x10^9$/L) at presentation	120	8.2 (6.4-9.5)	7.5 (5.6-9.5)	0.338[1]
ESR (mm/h) at presentation	141	41.0 (22.0-55.0)	42.0 (24.0-65.2)	0.352[1]
CRP (mg/L) at presentation	146	33 (16.5-56.0)	23.7 (14.9-46.6)	0.129[1]
Nucleated cell count on preoperative aspirate	93	33228 (13134-74540)	28174 (10758-51040)	0.282[1]
Duration of Symptoms at Presentation (days)	129	105.0 (21.0-232.5)	150.0 (24.5-300.0)	0.317[1]
Time from implant to presentation (years)	155	2.2 (1.0-5.2)	3.6 (0.9-7.4)	0.221[1]

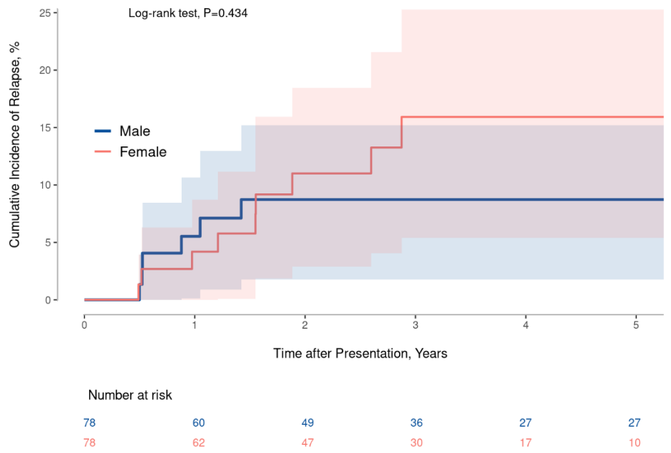
Values for Tables 1 & 2 represent median (quartile 1 to quartile 3) for continuous variables and frequency (percentage) for discrete variables. N is the number of non-missing values. P values are by [1] Wilcoxon rank sum, [2] Pearson χ^2, [3] Fisher exact or [4] log-rank tests .

Table 2. Outcomes by sex

Outcomes by Sex	N	Male (N=78)	Female (N=78)	P value
Stage 1 Hospital LOS (days)	156	4.0 (3.0-5.0)	4.0 (4.0-5.0)	0.070[1]
Stage 2 Hospital LOS (days)	156	3.0 (2.0-3.0)	3.0 (3.0-4.0)	0.087[1]
Adverse Drug Reaction	154	8 (10.4%)	15 (19.5%)	0.114[2]
Thromboembolic Complication	154	0 (0.0%)	1 (1.3%)	1.000[3]
C.diff infection during antimicrobial treatment	154	1 (1.3%)	4 (5.3%)	0.163[2]
Post Operative Wound Infection	152	4 (5.2%)	6 (8.0%)	0.486[2]

Relapse, % (cumulative # events)
Years = 1
Years = 2
Years = 3
Total Number
	156	
		4 (5.6%)
		6 (8.8%)
		6 (8.8%)
		7
			
			3 (4.2%)
			7 (11.1%)
			9 (16.1%)
			9
				0.434[4]

Figure 1. Cumulative Incidence of Relapse Plot



CONCLUSIONS

- This retrospective case-matched study did not detect any significant differences in outcomes between males and females with staphylococcal PJI who underwent two stage exchange arthroplasty.
- Although not statistically significant, women had slightly longer hospitalization and high numbers with adverse drug reaction and *Clostridium difficile* infection compared with men.
- There were no significant differences in baseline characteristics apart from underlying immunosuppression (4% in males vs 16.4% in females). Two of the 9 relapses which occurred in females were immunosuppressed.
- This study included only staphylococcal PJI; therefore was not able to evaluate the differences in microbiology of PJI between males and females, which could also impact outcome.
- Success rates for PJI treated with two-stage exchange arthroplasty are high in this cohort consistent with previously reported literature. Given the relative infrequency of treatment failure, larger studies are need to evaluate if differences in outcome exist

REFERENCES

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ACKNOWLEDGEMENT

Image created using Biorender software