

Bone and Joint Infections among Hematopoietic Stem Cell Transplant (HSCT) Recipients

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ABSTRACT

BACKGROUND

Bone and joint infections (BJI) among HSCT recipients are not well described.

METHODS

- We retrospectively reviewed 5,861 patients who underwent HSCT at Mayo Clinic, Rochester from 1/1/2005 through 1/1/2015.
- All adults who developed BJI after HSCT were included in the analysis (Fig 1). Kaplan Meier estimate was used to evaluate time to event.

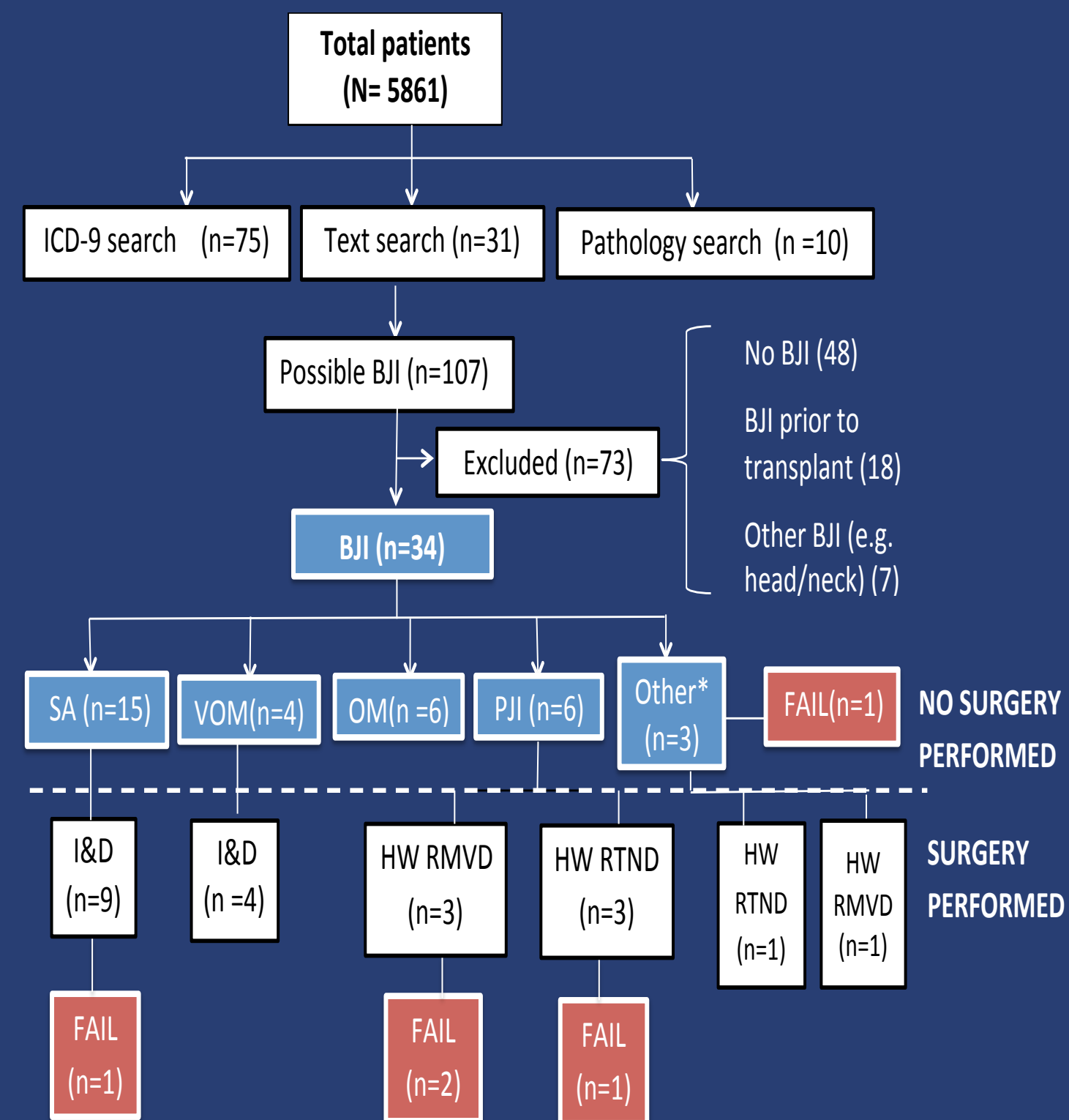
RESULTS

- Only 34 (0.6%) developed BJI. Native joint septic arthritis was the most common BJI (Figure 1).
- BJI was diagnosed a median of 41 (range 1-129) months after allogeneic (14/34, 41%) or autologous (20/34, 59%) HSCT.
- Gram positive pathogens were the most frequently isolated (25/31, 81%). All patients were given induction antimicrobial therapy; most underwent concomitant surgical debridement (23/34, 68%).
- Therapy was unsuccessful in 5/34 (14.7%), with the cause of death related to the underlying BJI in two (40%). Median overall survival was 12.9 months (3.7-26).

CONCLUSION

- In our cohort, BJI among HSCT recipients was infrequent.

FIGURE 1 :FLOW CHART OF STUDY PATIENTS



LEGEND FOR FIGURE 1: BJI – Bone and Joint Infection; SA – Septic Arthritis; VOM- Vertebral osteomyelitis; OM – Osteomyelitis; PJI – Prosthetic joint infection; I&D- Incision and debridement; HW – Hardware; RMVD – removed; RTND – retained; BJI = Bone and Joint Infection
 *Other – Necrotizing fasciitis, Hardware infection

STUDY RESULTS

BASELINE CHARACTERISTIC	n (%)
	median (range)
DEMOGRAPHICS	
Sex, Female	9 (26.5)
Age (yr)	58 (20-72)
PRIMARY HEMATOLOGIC MALIGNANCY	
Myeloid (AML/MDS/CML)	9 (26.5)
Lymphoid (ALL, CLL, HD, MM, NHL and other lymphomas)	25 (73.5)
TYPE OF TRANSPLANT	
Allogeneic	14 (41.1)
HEMATOLOGIC TESTS AT TIME OF INFECTION	
Neutropenia (n)	8 (23.5)
Duration of Neutropenia (days)	8 (8-227)
ANC (mm ³)	4125 (50-27300)
CHARACTERISTICS OF INFECTION	
Organism Isolated, n (%)	31 (91)
<i>Gram positive</i>	
<i>Staphylococcus aureus</i>	6
Coagulase negative Staph	7
<i>Streptococcus pneumoniae</i>	5
Enterococcus sp.	2
Other gram positive species	5
<i>Gram negative</i>	
Enterobacteriaceae	3
Pseudomonas sp.	1
Polymicrobial	1
Other (NTM)	1
Inflammatory markers	
ESR (mm/h)	50 (1-138)
CRP (mg/dL)	38.1 (4.8-346.4)
Synovial Fluid analysis, n (%)	
Cell count (µL)	19,481 (52-350,658)

DESCRIPTION OF TREATMENT	
Choice of Induction Antimicrobial Therapy	
IV Antibiotics alone	23
IV plus oral	9
Oral alone	2
Duration Induction Antimicrobials (days)	33 (2-108)
Patients on Maintenance Antimicrobials	6 (17.6)
Duration Maintenance Antimicrobials (days)	29.5(6-287)
Patients on lifelong suppressive therapy	8 (23.5)
OUTCOME	
Treatment Failure	5/34(14.7)
Reason for Treatment Failure	
Early progression	3
Relapse*	2
Reinfection*	1
Duration from Infection Diagnosis to Treatment Failure (mos)	0.37(0.1-48)
Overall Mortality, n (%)	27 (80.4)
Time to death from infection diagnosis (mos)	13 (0.03-76)
Time to death, successfully treated	13 (0.7-76)
Time to death, treatment failure	31.87 (0.03-70.57)
Cause of Death	
Relapse of underlying malignancy	10
BJI	2
Other infection	9
Other, non-infectious	1
Unknown	5

LEGEND: AML – acute myelogenous leukemia; MDS- myelodysplastic syndrome; CML –chronic myelogenous leukemia; ANC – absolute neutrophil count; ESR- erythrocyte sedimentation rate; CRP – c-reactive protein;
 * One patient had both relapse and re-infection

DISCUSSION & SUMMARY

- Our cohort is the first, largest single center study describing BJI among HSCT recipients
- BJI appears to be an infrequent complication among HSCT recipients.
- When BJI occurs, native joint septic arthritis seems to be more common than either osteomyelitis or PJI.
- Pathogens appear similar among those patients without HSCT, with CoNS and *S. aureus* being the most common.
- Treatment involving combination surgical-medical modalities is successful for the majority, with most patients surviving >1 year after BJI.
- The mortality among HSCT patients is high but unrelated to the BJI and is likely a consequence of the underlying malignancy.
- More studies that describe BJI as an outcome among HSCT is needed.

REFERENCES

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