



## The 65th ASH Annual Meeting Abstracts

## POSTER ABSTRACTS

## 721.ALLOGENEIC TRANSPLANTATION: CONDITIONING REGIMENS, ENGRAFTMENT AND ACUTE TOXICITIES

**Routine Computed Tomography before Pediatric Hematopoietic Stem Cell Transplantation and Association with Length of Stay and Early Non-Relapse Mortality**

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**Introduction:** Computerized tomography (CT) scans of the sinus, chest, abdomen, and pelvis are often performed in children prior to hematopoietic stem cell transplantation (HSCT) to evaluate for occult infections. Identification of infectious abnormalities could allow for pre- or post-HSCT infection prophylaxis to reduce morbidity or mortality. However, the association of abnormal pre-HSCT and adverse outcomes post-HSCT has not been previously examined. Additionally, routine imaging may identify incidental non-infectious findings, potentially necessitating additional diagnostic workup and unnecessary radiation exposure. In this study, we sought to investigate the prevalence of abnormal findings on CT scans in children undergoing HSCT and their association with post-HSCT length of stay (LOS) and early non-relapse mortality (NRM).

**Methods:** We constructed a retrospective cohort of children, adolescents, and young adults (0-26y) who received a HSCT at Children's of Alabama between 2003 and 2019. Institutional Review Board approval was obtained prior to data collection. Eligibility included availability of pre-HSCT CT reports which were abstracted by the study team from medical records and were coded as either normal, infectious, or non-infectious abnormalities. Demographic (age at HSCT, sex, race/ethnicity) and HSCT characteristics (indication [primary diagnosis], type of HSCT [allogeneic, autologous], cell source, donor type) were abstracted from medical records. Vital status at day +100 was ascertained and causes of death were classified as relapse-related mortality and NRM. Post-HSCT outcomes of interest included length of stay (using day of HSCT as day 0) and day +100 NRM. Association between abnormal pre-HSCT CT and LOS was modelled using linear regression after adjusting for age at HSCT, sex, race/ethnicity, primary diagnosis, type of HSCT, cell source and donor type. Stratified analyses for patients with infectious abnormalities and those who received allogeneic HSCT were performed. Association between pre-HSCT abnormal CT and early (day +100) NRM was examined using logistic regression after adjusting for above covariates.

**Results:** Overall, 236 patients met eligibility for inclusion. Cohort characteristics are included in *Table*. Median age at HSCT was 5.8y (range, 0.1-26), 54.7% were male and 57.6% were non-Hispanic white. Most patients received an allogeneic HSCT (66.1%); most common source of stem cells was bone marrow (60.3%), and most common donor was matched unrelated (40.7%). The most common anatomic location imaged using CT scan was chest (91%) followed by abdomen (89%), pelvis (87%), sinus (57%), head (46%) and neck (8.5%). An abnormal pre-HSCT CT scan was identified in 99 patients (41.9%). Infectious abnormalities were identified in 73 (31%) and a non-infectious abnormality was identified in 26 (11%). Sinus CT was most likely to demonstrate any abnormality. Compared to no abnormality, infectious abnormality was more commonly noted in patients with acute lymphoblastic leukemia (20.4% vs 27.4%,  $P=0.01$ ) and acute myeloid leukemia (8.0% vs 23.3%,  $P=0.01$ ). Abnormalities noted on CT scans are shown in *Figure*. The most commonly identified infectious abnormalities were sinusitis (58.9%), lung densities (20.5%), and enteritis (8.2%). The most common non-infectious abnormality noted was active primary disease (15.4%). No association between an abnormal pre-HSCT CT scan and LOS was noted after adjusting for covariates ( $b=1.0$ , 95% confidence interval [CI]= -6.2-8.3,  $P=0.8$ ). Similarly, there was no association between infectious abnormalities noted on pre-HSCT CT and LOS ( $b= -0.4$ , 95% CI=-5.8-5.1,  $P=0.9$ ) or among patients undergoing an allogeneic HSCT ( $b=1.0$ ; 95% CI=-6.2-7.4,  $P=0.8$ ). Five patients died by day +100 due to NRM (respiratory failure=2, graft-vs-host disease=1, intracranial bleed=1, multi-organ failure=1). However, this was not significantly associated with abnormal pre-HSCT CT scan (odds ratio=1.9, 95%CI=0.1-87.8,  $P=0.7$ )

Discussion: We show that routine pre-HSCT CT scans identify abnormalities in over 40% of children, adolescent and young adults undergoing HSCT, however, these are not associated with greater length of stay post-HSCT or early mortality. Future research is needed to understand the utility of pre-HSCT CT scans in identifying patients at risk of post-HSCT adverse events.

**Disclosures Goldman:** *Karius*: Consultancy.

Table. Demographic and HSCT characteristics of patients, overall and by type of CT abnormality

Characteristic	Entire cohort	No Abnormality	Infectious Abnormality	Non-infectious Abnormality	P
Median age at HSCT in y (range)	5.8 (0.1-26.0)	5.2 (0.1-26.0)	7.2 (0.3-10.2)	6.0 (0.4-20.4)	0.6
Male sex, n (%)	129 (54.7)	76 (55.5)	41 (56.2)	12 (46.2)	0.7
Race/Ethnicity, n (%)					
Non-Hispanic White	136 (57.6)	81 (59.1)	39 (53.4)	16 (61.5)	0.2
Hispanic	26 (11.0)	15 (11.0)	7 (9.6)	4 (15.4)	
Black or African-American	71 (30.1)	41 (29.9)	24 (32.9)	6 (23.1)	
Other	3 (1.3)	0 (0.0)	3 (4.1)	0 (0.0)	
Diagnosis, n (%)					
Acute lymphoblastic leukemia	54 (22.9)	28 (20.4)	20 (27.4)	6 (23.1)	0.01
Acute myeloid leukemia	32 (13.6)	11 (8.0)	17 (23.3)	4 (15.4)	
Other malignant disorders	90 (38.1)	66 (48.2)	16 (21.9)	5 (19.2)	
Other non-malignant Disorders	45 (19.1)	24 (17.5)	16 (21.9)	5 (19.2)	
Severe aplastic anemia	15 (6.4)	8 (5.8)	4 (5.5)	3 (11.5)	
HSCT Type, n (%)					
Allogeneic	156 (66.1)	74 (54.0)	62 (84.9)	20 (76.9)	<0.001
Autologous	80 (33.9)	63 (46.0)	11 (15.1)	6 (23.1)	
Donor, n (%)					
Matched Related	48 (20.3)	24 (17.5)	13 (17.8)	11 (42.3)	<0.001
Matched Unrelated	96 (40.7)	47 (34.3)	41 (56.2)	8 (30.8)	
Haploidentical	11 (4.7)	3 (2.2)	7 (9.6)	1 (3.9)	
Cell Source, n (%)					
Bone Marrow	94 (60.3)	46 (62.2)	34 (54.8)	14 (70.0)	0.8
Peripheral Blood	20 (12.8)	9 (12.2)	9 (14.5)	2 (10.0)	
Cord blood	42 (26.9)	19 (25.7)	19 (30.6)	4 (20.0)	

HSCT denotes hematopoietic stem cell transplantation; P-value compares characteristics between patients with no abnormality, patients with infectious abnormalities, and patients with non-infectious abnormalities.

Figure. Abnormalities noted on pre-HSCT CT scans

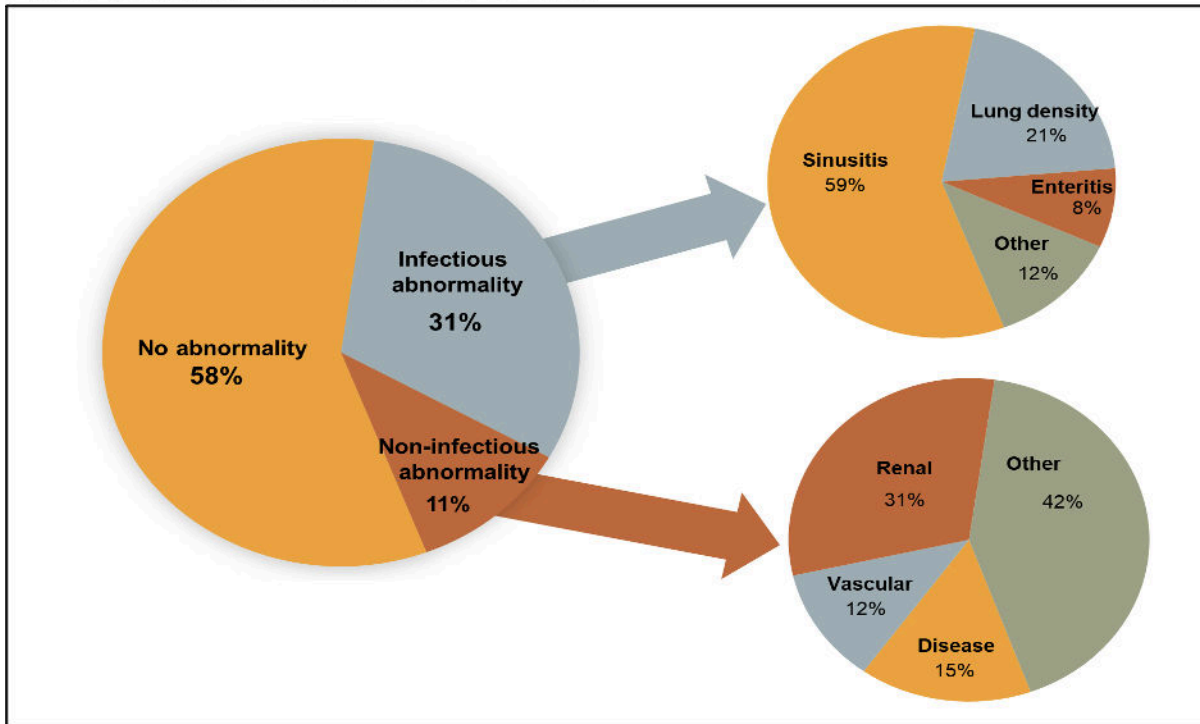


Figure 1

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