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POSTER ABSTRACTS

612.ACUTE LYMPHOBLASTIC LEUKEMIAS: CLINICAL AND EPIDEMIOLOGICAL

Socioeconomic Determinants and the Biology and Outcomes of Acute Lymphoblastic Leukemia in Adults

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Introduction

Implementation of pediatric-inspired chemotherapy regimens improved survival outcomes in adolescents and young adults (AYA) with acute lymphoblastic leukemia (ALL). Prior studies demonstrated that Non-Hispanic White (NHW) patients had better survival outcomes in the real-world AYA setting, but this effect was not observed in the pivotal CALGB 10403 clinical trial. To better characterize the socioeconomic versus biologic determinants of ALL outcomes, we conducted a single-institution, retrospective analysis of adult patients with ALL at the University of Chicago. We sought to investigate the impact of socioeconomic factors on ALL outcomes when patients are treated at a multidisciplinary, tertiary-care ALL center.

Methods

Adult patients with ALL treated at the University of Chicago between 2010 and 2022 were studied. Subtype classification was based on the 2022 WHO criteria. ALL patients were treated according to age-appropriate regimens (AYA with CALGB 10403-based regimens, older adults (>40) with lower intensity approaches). Because of treatment differences, outcomes of AYA and older patients were analyzed separately. Self-reported race was reported with guidelines from the National Cancer Institute (https://www.nih.gov/nih-style-guide/race-national-origin). Body mass index (BMI) was recorded at diagnosis. Annual median income was estimated based on the zip code of residence and categorized as high (>$50,000), middle ($35,000-50,000), and low (<$35,000). Additionally, we extracted data from the public use US population-based cancer registries of the Surveillance, Epidemiology, and End Results (SEER, http://seer.cancer.gov) program to estimate overall survival (OS) of ALL patients diagnosed between 2005 and 2020.

Results

Demographic and disease characteristics of 221 adult ALL patients treated at the University of Chicago are summarized in **Table 1**. *BCR::ABL1* was more prevalent in Black ALL patients compared to NHW and Hispanic White (HW) patients (59% vs 24% and 20%, respectively, p=0.001). This phenotypic subtype was also associated with higher BMI (OR 7.64; 95% CI=1.17-49.9, p=0.03). Compared to NHW patients, low annual household income was more frequent in HW and Black patients (2% vs 13% and 24%, respectively, p<0.001). Similar OS was seen among NHW, HW, and Black patients when stratified by age (AYA vs older adult), B vs T-lineage phenotype, or median household income. Obesity at B-ALL diagnosis was associated with adverse OS, and median OS for patients with BMI <30, 30-40, and >40 were 113 months, 34 months (HR 2.04; 95% CI=1.27-3.28, p=0.003), and 23 months (HR 2.70; 95% CI=1.34-5.42, p=0.005), respectively. In our multivariable analysis, factors that were independently associated with adverse OS were age and BMI at diagnosis (HR 6.93; 95% CI 2.27-21.1, p=0.0007; HR

10.3; 95% CI 2.56-41.5, p=0.001, respectively), while *BCR::ABL1* positivity predicted favorable OS (HR 0.41; 95% CI 0.2-0.87, p=0.02, see **Figure 1**). Compared to the SEER cohort, OS in older University of Chicago patients was better than the national average (53 months vs 23 months, HR 0.70; 95% CI=0.56-0.88, p=0.003). Among SEER AYA patients from 2015-2020, HW (HR 1.54; 95% CI=1.26-1.91, p=<0.001) and Black (HR 1.64; 95% CI=1.14-2.36, p=0.006) patients had significantly worse OS compared to NHW patients. Finally, SEER data showed that patients with higher median household incomes had better OS than patients with lower incomes. Specifically, older adult patients who reported higher median household income had better OS at 24 months compared to older adults with medium or low income at 15 months (respectively, HR 1.25; 95% CI=1.10-1.47, p=<0.001; HR 1.52; 95% CI=1.07-2.17, p=0.01).

Conclusion

While SEER data demonstrated significant OS differences based on race and median household income nation-wide, these variables did not predict adverse OS at our institution. The University of Chicago has an ALL center with a dedicated AYA clinic offering resources to support patients throughout their long pediatric-inspired therapies, as well as clinical trial options for both young and older adults. Located in a historically Black and low-income neighborhood, the University of Chicago plays a critical role in addressing socioeconomic disparities in ALL care for our community. Further interventional studies are needed to modify the poor prognostic impact of obesity in patients with ALL.

Disclosures Patel: *AbbVie:* Honoraria; *BMS:* Honoraria; *Kronos Bio:* Research Funding; *Pfizer:* Research Funding. **Gurbuxani:** *AbbVie:* Consultancy; *Jazz Pharmaceuticals:* Consultancy; *UpToDate:* Patents & Royalties: Royalties for contributions to various topics. **Thirman:** *AbbVie:* Research Funding; *Nurix:* Research Funding; *Syndax:* Research Funding; *Merck:* Research Funding; *AbbVie:* Honoraria. **Liu:** *Nkarta:* Consultancy; *Astellas:* Research Funding; *Pfizer:* Consultancy; *Miltenyi Biotec:* Research Funding; *Rigel:* Consultancy; *Servier:* Consultancy; *Nkarta:* Research Funding; *CTI Biopharm:* Consultancy; *Agios:* Consultancy; *Alexion:* Research Funding. **Odenike:** *BMS/Celgene, Novartis, Rigel, Servier, Taiho ; DSMB-Kymera therapeutics:* Membership on an entity's Board of Directors or advisory committees; *ABBVIE, Astrazeneca, Agios, Aprea, Astex, BMS/Celgene, CTI, Daiichi, Incyte, Janssen, Kartos, Novartis, NS-Pharma and Oncotherapy Sciences:* Research Funding. **Larson:** *Immunogen:* Consultancy; *Servier:* Consultancy; *Novartis:* Consultancy, Research Funding; *MedPace:* Consultancy; *Kling Biotherapeutics:* Consultancy; *Jazz Pharmaceuticals:* Consultancy; *Cellectis:* Research Funding; *Epizyme:* Consultancy; *Daiichi Sankyo:* Research Funding; *Forty Seven/Gilead:* Research Funding; *Rafael Pharmaceuticals:* Research Funding; *CVS/Caremark:* Consultancy; *Astellas:* Consultancy, Research Funding; *Ariad/Takeda:* Consultancy; *AbbVie:* Consultancy.

Table 1. Demographic characteristics of University of Chicago ALL cohort (n=221)

	All patients (n= 221)
Age, median, years (range)	43 (18 – 88)
Female gender, n (%)	105 (48)
Body mass index, n (%)	
<30	150 (68)
30-40	54 (24)
>40	17 (8)
Race/ethnicity, n (%)	
White	131 (59)
Hispanic	48 (22)
Black	33 (15)
Asian	7 (3)
More than one race	2 (1)
Median income, n (%)	
High	129 (59)
Middle	73 (33)
Low	17 (8)
Immunophenotype	
B-ALL	185 (84)
Pre-T-ALL	25 (11)
ETP-ALL	11 (5)
ALL subtype, n (%)	
B-ALL	
BCR::ABL1	50 (23)
BCR::ABL1-like	26 (12)
Low hypodiploid	17 (8)
KMT2A-rearranged	13 (6)
High hyperdiploid	8 (4)
T-ALL	
HOXA-dysregulated	10 (5)
TAL1-rearranged	5 (3)
Allogeneic HCT, n (%)	49 (22)

ETP, early T-precursor; HCT, hematopoietic cell transplant

Figure 1. Multivariable Analysis of University of Chicago ALL Cohort

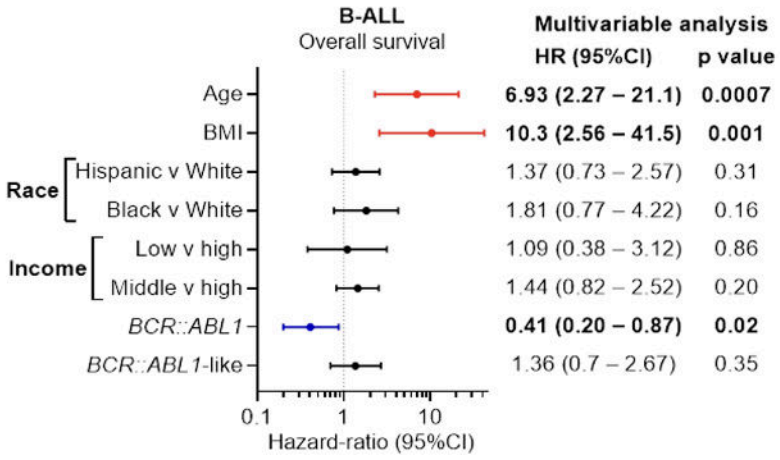

Figure 1

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