IMPACT OF DELAYED CHEMOTHERAPY INITIATION IN ADULT ACUTE LYMPHOBLASTIC LEUKEMIA: A REAL-WORLD MULTI-CENTER COHORT STUDY ACROSS THE UNITED STATES

Yu-Han Chen, MD[1], Andrea Yun-En Sun, BS[2], Ting-Hsuan Chiang, MD[3], Natasha Rastogi, MD[1], Cho-Hao Lee, MD[4]

1 Department of Internal Medicine, Englewood Hospital and Medical Center, NJ, USA
2 College of Medicine, National Yang Ming Chiao Tung University, Taipei, Taiwan
3 Department of Anesthesiology and Perioperative Care, University of California Irvine, CA, USA
4 Division of Hematology and Oncology, Department of Internal Medicine, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan

ENGLEWOOD HEALTH

Hackensack Meridian School of Medicine

Introduction

While over half of acute lymphoblastic leukemia (ALL) cases occur in children, with cure rates up to 85%, outcomes **decline significantly with age**.

Adults over 40 have cure rates of **30–40%.**

Delaying therapy may be necessary to address comorbidities or risk factors in adults.

Although immediate treatment is the standard of care, the impact of treatment delays on survival is **unclear**, particularly in adults.

Existing studies largely focus on pediatric populations, with mixed results.

Aim

To evaluate the effect of delayed chemotherapy on overall survival and adverse events in adults with ALL.

Methods

This retrospective database study utilized electronic health records from over **50 U.S. healthcare organizations** within the **TriNetX Network**.

Method

The baseline cohort included adults **aged ≥ 18 years diagnosed with ALL since January 1, 2015.**

The study population consisted of two groups:

- **Delayed treatment group**: Patients who initiated chemotherapy more than 10 days after diagnosis
- **Control group**: Patients who started chemotherapy within 10 days of diagnosis

The primary outcome was **mortality**. Secondary outcomes included complications from bone marrow transplantation, severe infection, hospital admissions, emergency department (ED) visits, and critical care use.

1:1 propensity score matching was performed, adjusting for demographics, staging, and laboratory results. Risk analysis models were employed to calculate risk ratios (RR) with 95% confidence intervals (CI) for the outcomes of interest across the comparison groups.

Result

A total of 7,108 patients were in the delayed treatment group, and 5,119 were in the control group.

Time Outcomes	1 Year	3 Year	5 Year	All Time Period
Mortality	1.00 (0.88, 1.13)	1.10 (1.00, 1.21)	1.11 (1.02, 1.21)	1.11 (1.02, 1.20)
Complications of transplant	1.53 (1.35, 1.73)	1.44 (1.30, 1.61)	1.39 (1.26, 1.54)	1.45 (1.31, 1.61)
Severe Infection	0.90 (0.85, 0.95)	0.93 (0.89, 0.98)	0.94 (0.89, 0.98)	0.94 (0.90, 0.98)
Inpatient Admission	0.79 (0.76, 0.81)	0.83 (0.81, 0.85)	0.83 (0.81, 0.85)	0.84 (0.82, 0.87)
ED visit	0.90 (0.86, 0.95)	0.91(0.87, 0.95)	0.91 (0.87, 0.95)	0.94 (0.90, 0.98)
Critical care use	0.72 (0.67, 0.78)	0.80 (0.75, 0.86)	0.83 (0.77, 0.88)	0.82 (0.76, 0.87)

Summary

Delayed chemotherapy initiation was associated with **increased** long-term mortality but correlated with a **lower risk of certain adverse events**.

Delayed treatment also **reduced** healthcare utilization, which may reflect the impact of increased mortality in this population.

Discussion

ICD-10 billing codes for event identification may have introduced classification bias, as healthcare organizations across different regions may employ varying coding practices.

Clinicians should aim for prompt initiation of therapy while balancing medical optimization needs. Further prospective studies are needed to validate these findings.

Yu-Han Chen, MD
Yu-Han.Chen@EHMChealth.org
X: @YuHanChen0213

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