Renal Risk Differences Between Diffuse Large B-Cell Lymphoma and Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma: A Real-World Matched Cohort Study

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Introduction

- Renal complications are common in hematologic malignancies but differ by subtype.
- **DLBCL** → aggressive, associated with acute kidney injury (AKI) from tumor lysis, infiltration, and intensive chemotherapy.
- **CLL/SLL** → indolent, associated with chronic kidney disease (CKD) due to immune-mediated nephropathies and long disease course.
- **Issue**: Direct comparisons of renal risk between these lymphomas are limited.
- **Why it matters**: Understanding whether AKI or CKD predominates by subtype can inform tailored monitoring.
- **Objective**: Compare risk of AKI and CKD in DLBCL versus CLL/SLL patients using a large real-world cohort.

Methods

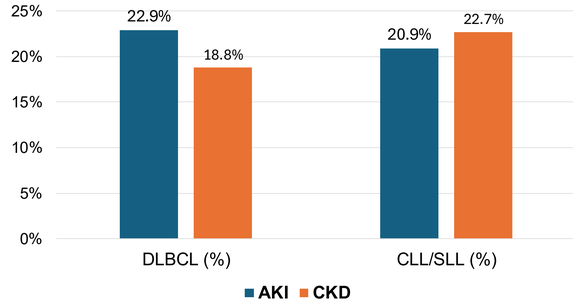
- **Data**: TriNetX Research Network (2015–2024).
- **Cohorts**:
  - DLBCL: ≥18 years, ICD-10 C83.3.
  - CLL/SLL: ≥18 years, ICD-10 C91.1.
- **Exclusions**: Prior hematologic malignancy other than index, prior renal transplant.
- **Outcomes**:
  - AKI (ICD-10 N17.x).
  - CKD (ICD-10 N18.x).
- **Analysis**: 1:1 propensity score matching for age, sex, race, diabetes, hypertension, cardiovascular disease, and baseline kidney function.
- **Statistics**: Odds ratios (ORs) with 95% confidence intervals (CIs), absolute risk differences, p-values.
- **Ethics**: De-identified, federated EHR data; IRB review not required.
- **Limitations**: Reliance on ICD coding, lack of granular treatment details, residual confounding.

Results

- Cohort size after matching: 9,719 DLBCL vs 9,719 CLL/SLL.
- **Acute Kidney Injury (AKI):**
  - DLBCL: 22.9% (2,224/9,719)
  - CLL/SLL: 20.9% (2,033/9,719)
  - ARD: +2.0% (95% CI 0.8–3.1, p=0.001)
  - OR: 1.12 (95% CI 1.05–1.20)
- **Chronic Kidney Disease (CKD):**
  - DLBCL: 18.8% (1,824/9,719)
  - CLL/SLL: 22.7% (2,210/9,719)
  - ARD: –3.9% (95% CI –5.1 to –2.8, p<0.001)
  - OR: 0.79 (95% CI 0.73–0.84)

Results Cont'd

Figure 1: Incidence of AKI and CKD in DLBCL vs CLL/SLL



Discussion

- **DLBCL**: AKI occurred in 22.9% vs 20.9%, a modest but statistically significant difference, consistent with tumor lysis, renal infiltration, and nephrotoxic chemotherapy.
- **CLL/SLL**: CKD was more prevalent (22.7% vs 18.8%), reflecting chronic disease burden, immune-mediated renal injury, and long treatment exposure.
- Clinical interpretation:
  - DLBCL → emphasize early AKI prevention and monitoring during induction therapy.
  - CLL/SLL → emphasize long-term CKD surveillance and management.
- **Strengths**: Large matched cohorts, clear differentiation of renal outcomes.
- **Limitations**: Coding bias, lack of regimen-level treatment data, potential unmeasured confounding.

Conclusion

- Renal outcomes differ significantly by lymphoma subtype:
  - DLBCL → higher AKI (22.9% vs 20.9%, OR 1.12).
  - CLL/SLL → higher CKD (22.7% vs 18.8%, OR 0.79).
- **Why it matters**: These data support subtype-specific renal surveillance strategies to reduce complications.
- **Next steps**: Prospective validation and exploration of treatment regimen contributions to renal risk.

References

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