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Impact of Atrial Fibrillation on Cardiovascular and Economic Outcomes in Patients with Chronic Lymphocytic Leukemia

Anjana Mohan¹, Keri Yang², Sizhu Liu², Randall Dick³, Boxiong Tang², Asher Chanan-Khan⁴

¹University of Houston, Houston, TX; ²BeiGene USA, San Mateo, CA;

³IBM Watson Health, Cambridge, MA; ⁴Mayo Clinic, Jacksonville, FL

Disclosures

- Anjana Mohan : Summer internship at BeiGene



Introduction

- Chronic lymphocytic leukemia (CLL) is the most frequently diagnosed hematologic cancer
- Patients are typically 60-80 years old and have co-morbidities that often complicate effective management of CLL including atrial fibrillation (AF)
- AF is the most common type of arrhythmia in the US, and is associated with high hospitalization and mortality rates
- AF increases the risk of cardiovascular complications, including stroke, bleeding events, heart failure, and further escalate the burden upon healthcare resource utilization (HRU) and economic cost



Objectives

To examine the impact of AF on:

- cardiovascular outcomes: stroke, bleeding events, heart failure
 - economic outcomes: costs, healthcare resource utilization (HRU)
- in patients with CLL



Methods

- **Study design:** Observational retrospective data analysis
- **Data source:** IBM MarketScan Treatment Pathway
- **Patient population:** CLL patients
- **Study period:** 01/01/2009-07/31/2020
- **Inclusion criteria:**
 - ≥ 1 claim for CLL during the study period
 - Index date: first date of CLL diagnosis
 - ≥ 18 years at the index date
 - ≥ 1 AF claim one year after the first observed CLL diagnosis
 - 1 claim for stroke/bleeding events/heart failure within 1 year of AF diagnosis
 - Continuous enrollment from 01/01/2009-07/31/2020



Methods

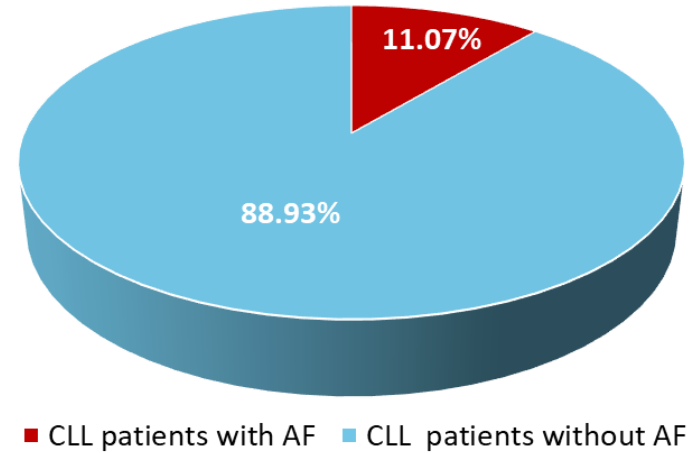
- **Outcomes:**
 - Cardiovascular outcomes:
 - Stroke
 - Bleeding events
 - Heart failure
 - Economic outcomes: HRU and costs
 - HRU: outpatient visits, emergency room visits, inpatient admissions, pharmacy visits, and length of stay (LOS)
 - Costs: overall, and by HRU type
- **Analyses:**
 - Chi-square tests: to compare the clinical outcomes
 - Mann Whitney Wilcoxon test: to compare the medians for HRU and costs
 - Logistic regression model: to evaluate the associations between AF and hospitalizations
 - Generalized linear model: to assess the association between AF and total costs



Results: Patient Characteristics

- Of the 23,756 newly diagnosed CLL patients, 11.07% had AF within 1 year of CLL diagnosis
- CLL patients with AF were older (median age: 67 vs 82 years) and were predominantly males (56.9% vs 65.1%) than CLL patients without AF

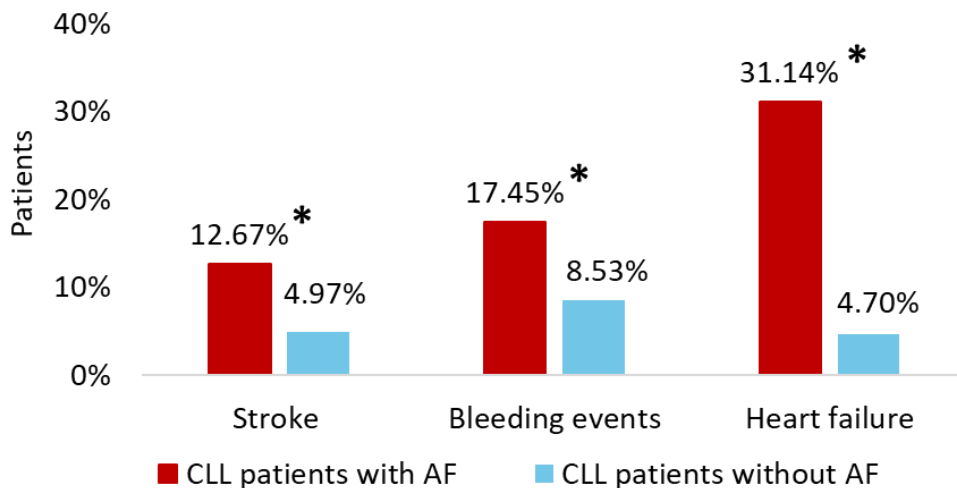
Figure 1. CLL patients with and without AF



Results: Cardiovascular Outcomes

- The prevalence of stroke, bleeding events, and heart failure were significantly higher among CLL patients with AF than CLL patients without AF

Figure 2. Cardiovascular outcomes among CLL patients with & without AF



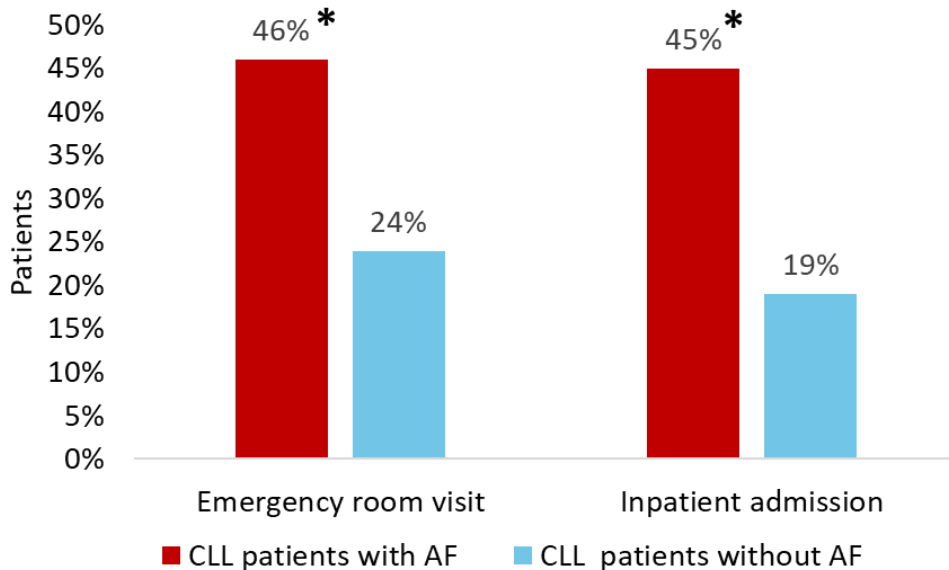
* P < 0.0001



Results: Economic Outcomes

- Median emergency room visits and median inpatient admissions were significantly higher among CLL patients with AF than CLL patients without AF

Figure 3. HRU among CLL patients with and without AF



* P < 0.0001



Results: Impact of AF on Hospitalization

- CLL patients with AF were twice more likely to be hospitalized than CLL patients without AF

Outcome: Inpatient Admission (Yes/No)	OR (95% CI)
Atrial Fibrillation (Reference = No)	
Yes vs No	2.03 (1.84-2.24)
Age	1.003 (1.001-1.006)
Gender (Reference = Females)	
Males vs Females	1.01 (0.95-1.09)
Stroke (Reference = No)	
Yes vs No	2.59 (2.29-2.93)
Bleeding events (Reference = No)	
Yes vs No	3.27 (2.97-3.60)
Heart failure (Reference = No)	
Yes vs No	5.47 (4.89-6.12)



Results: Association Between AF and Total Costs

- CLL patients with AF incurred significantly higher total cost than CLL patients without AF

Outcome: Costs (USD)	Cost Ratio	95% CI for CR
Atrial Fibrillation (Reference = No)		
Yes vs No	1.44*	1.36-1.53
Age		
	0.979*	0.978-0.98
Gender (Reference = Females)		
Males vs Females	1.11*	1.08-1.16
Stroke (Reference = No)		
Yes vs No	1.36*	1.25-1.46
Bleeding events (Reference = No)		
Yes vs No	2.03*	1.91-2.15
Heart failure (Reference = No)		
Yes vs No	2.07*	1.93-2.22



Conclusions

- Significantly higher hospitalizations, cardiovascular events and economic burden were incurred by CLL patients who had AF than those without AF
- The presence of stroke, bleeding events, heart failure increased HRU and costs among CLL patients with AF
- This study highlighted the importance of better disease management and improved CLL therapeutics with a lower risk of AF to prevent or minimize the incidence of AF in CLL patients

