

# IMPACT OF ATRIAL FIBRILLATION ON CARDIOVASCULAR AND ECONOMIC OUTCOMES IN PATIENTS WITH CHRONIC LYMPHOBLASTIC LEUKEMIA

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## BACKGROUND

- 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 other cardiovascular complications, including stroke, bleeding events, heart failure, and is associated with increased healthcare resource utilization (HRU) and economic costs
- There is limited real-world evidence on the clinical and economic impact of AF in CLL patients

## OBJECTIVE

- To examine the impact of AF on cardiovascular outcomes (stroke, bleeding events, heart failure) and economic outcomes (costs, healthcare resource utilization) in patients with CLL

## METHODS

- Data source and cohort creation**
  - Newly diagnosed CLL patients were identified in the IBM MarketScan Treatment Pathway from January 1, 2009 - July 31, 2020
  - Eligibility criteria:
    - ≥1 claim for CLL during the study period
    - Index date: first date of CLL diagnosis
    - Aged ≥18 years at index date
    - ≥1 AF claim 1 year after first observed CLL diagnosis during study period
    - 1 claim for stroke/bleeding events/heart failure within 1 year of AF diagnosis
    - Continuous enrolment January 1, 2009-July 31, 2020
  - Patients were categorized into CLL patients with and without AF based on the occurrence of AF within 1 year of CLL diagnosis
  - Economic outcomes were assessed for 1 year after date of first recorded AF, stroke, bleeding events, and/or heart failure event

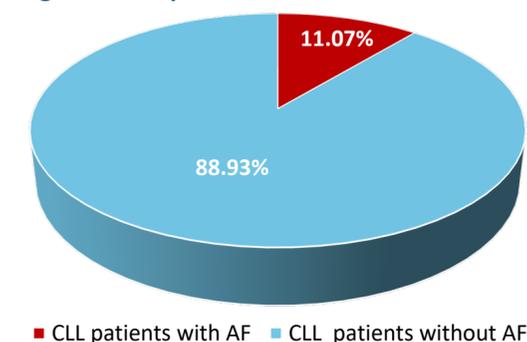
## METHODS

- Outcomes**
  - Cardiovascular outcomes:
    - Stroke: ischemic stroke, hemorrhagic stroke, and transient ischemic attack
    - Bleeding events: major and minor 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
- Statistical Analysis**
  - Clinical outcomes between CLL patients with and without AF were compared using chi-square tests
  - Medians for HRU and cost outcomes were compared using Mann Whitney Wilcoxon test
  - The associations between AF and hospitalizations were evaluated by multivariate logistic regression model controlling for age, gender, stroke, bleeding events and heart failure
  - Association between AF and total costs was assessed using a generalized linear model

## RESULTS

- Patient Characteristics**
  - Of the 23,756 newly diagnosed CLL patients, 11.07% had AF within 1 year of CLL diagnosis (**Figure 1**)

Figure 1. CLL patients with and without AF

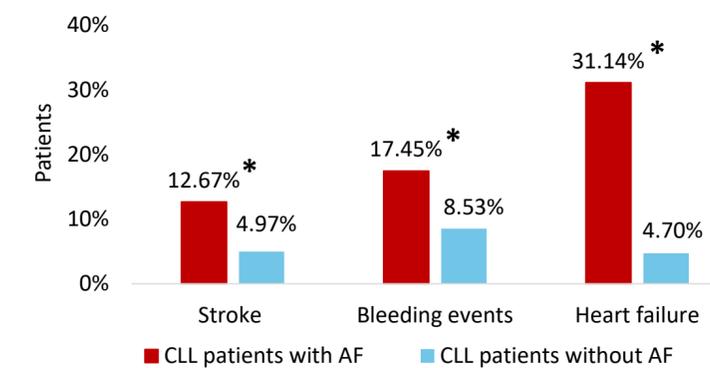


- More CLL patients with AF were older (median age: 67 vs 82 years) and male (56.9% vs 65.1%) than CLL patients without AF

## 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**)

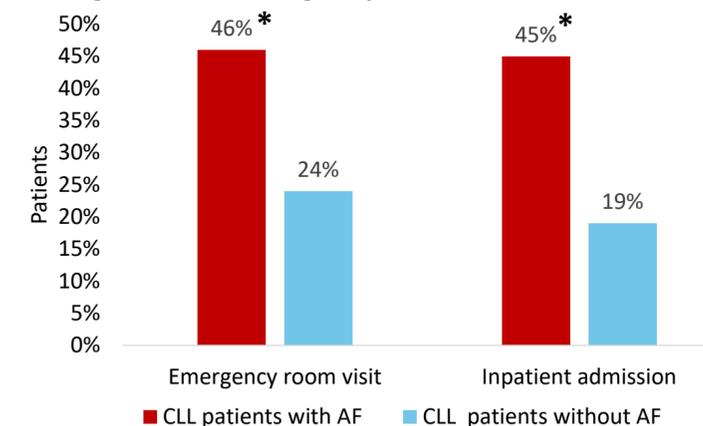
Figure 2. Cardiovascular outcomes among CLL patients with & without AF



\* P < 0.0001

- Economic outcomes**
  - Median emergency room visits, and inpatient admissions were significantly higher among CLL patients with AF than those without AF (**Figure 3**)
  - Median outpatient, pharmacy, and total costs were significantly higher among CLL patients with AF than those without AF

Figure 3. HRU among CLL patients with and without AF



\* P < 0.0001

## RESULTS

- Impact of AF and hospitalization**
  - CLL patients with AF were twice as likely to be hospitalized (**Table 1**)

Table 1. Impact of AF on hospitalization

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

- Total healthcare costs**
  - CLL patients with AF incurred significantly higher total costs (**Table 2**)

Table 2. Association between AF and total costs

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

\* P < 0.0001

## CONCLUSIONS

- Significantly higher rates of hospitalizations, cardiovascular events, and economic burden were incurred by CLL patients with AF than those without AF
- Stroke, bleeding events, and heart failure increased HRU and costs among CLL patients with AF
- Better disease management, monitoring for AF, and improved CLL therapeutics with a lower risk of AF or cardiovascular toxicity are needed to minimize the incidence of AF in CLL patients