Real World Evidence of Impact of Atrial Fibrillation on Clinical and Economic Outcomes in Patients with Chronic Lymphocytic Leukemia

P685

Keri Yang[1], Tom Liu[1], Boxiong Tang[1], Asher Chanan-Khan[2]
[1]BeiGene USA, Inc. San Mateo, CA; [2]Mayo Clinic, Jacksonville, FL

Correspondence
Keri.yang@beigene.com

BACKGROUND

- Chronic lymphocytic leukemia (CLL) is the most prevalent hematologic cancer in adults with around 3.6-6.9 new cases per 100,000 per year in Europe[1]
- CLL patients are often diagnosed at an older age and at risk of cardiovascular disease, including atrial fibrillation (AF), which often complicate effective management of CLL[2-3]
- Atrial fibrillation is the most common arrhythmia and is associated with high rates of hospitalization and mortality
- While the incidence of AF in CLL has been increasingly reported, the implications of AF in real-world CLL patients remain understudied

OBJECTIVE

- This study aimed to assess the impact of AF on clinical and economic outcomes in CLL patients

METHODS

- **Study Design:** Retrospective, observational study
- **Study Period:** 2017-2020
- **Data Source:**
  - De-identified U.S. claims data from the IBM MarketScan® Commercial and Medicare supplemental claims dataset, containing inpatient, outpatient, and prescription drug files
- **Study Population:**
  - Newly diagnosed adult CLL patients
  - ≥1 claim for CLL during the study period
  - Index date: the first date of CLL diagnosis
  - Aged ≥18 years at index date
  - Patients were followed for ≥3-months pre-index, and from index to last follow-up or death
- **Cohorts:** Patients were categorized into CLL patients with and without AF based on the occurrence of AF within 1 year of CLL diagnosis
  - CLL with AF: ≥1 AF claim after first observed CLL diagnosis
  - CLL without AF*:* No AF claim after first observed CLL diagnosis
- **Outcomes:**
  - Clinical outcomes: Incidences of heart failure, bleeding, and stroke
  - Healthcare resource utilization (HRU) and costs
    - HRU: outpatient visits, emergency room visits, inpatient admissions, pharmacy visits, and length of stay (LOS)
    - Costs: overall, and by HRU type

METHODS

- **Statistical Analysis:**
  - Mean and standard deviation (SD) were calculated for all continuous variables
  - Frequency and percentage were calculated for all categorical variables
  - Multivariable regression analyses were conducted to examine the association between AF and outcomes

RESULTS

- **Patient Characteristics (Table 1)**
  - Among a total of 16,801 newly diagnosed patients with CLL included in the study, 20% developed AF (**Figure 1**)
  - CLL patients with AF were significantly older than those without AF (median: 77 versus 62 years; *P*<.001)
  - Compared with CLL patients without AF, patients with AF had significantly more AF history (8.4% vs 0.3%; *P*<.001) and comorbidities at baseline, as shown by higher Charlson comorbidity index (CCI; median: 3.0 vs 1.0; *P*<.001)

Table 1. Demographic and Clinical Characteristics of CLL Patient Population

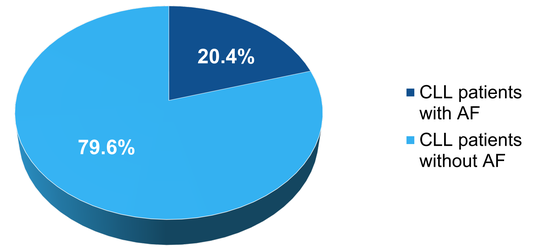
	CLL with AF (N=3420)	CLL without AF (N=13381)
Age, years, Median; Mean (SD)	77.0; 75.3 (11.7)	62.0; 62.3 (13.4)
Age, ≥65 years, n (%)	2617 (76.5)	4812 (36.0)
Male, n (%)	2203 (64.4)	7565 (56.5)
Geographic Region, n (%)		
Northeast	943 (27.6)	3078 (23.0)
North Central	1048 (30.6)	3463 (25.9)
South	1048 (30.6)	4838 (36.2)
West and Unknown	381 (11.1)	2002 (15.0)
CCI score, Mean (SD)	3.1 (2.3)	1.3 (1.9)
Baseline Comorbidities, n (%)		
AF	288 (8.4%)	41 (0.3%)
Diabetes	788 (23.0%)	1988 (14.9%)
COPD	623 (18.2%)	1104 (8.3%)
Renal Disease	460 (13.5%)	587 (4.4%)

Abbreviations: CCI, Charlson comorbidity index; COPD, chronic obstructive pulmonary disease; SD, standard deviation.

  - Compared with CLL patients without AF, the most common comorbidities among patients with AF were diabetes without complications (23.0% versus 14.9%), followed by chronic obstructive pulmonary disease (COPD) (18.2% vs. 8.3%), and renal disease (13.5% versus 4.4%)

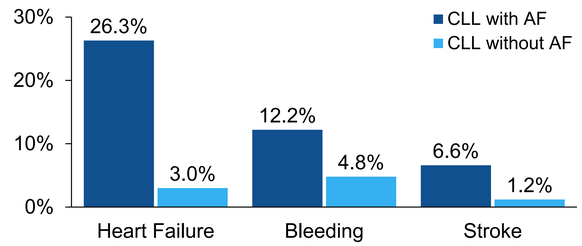
RESULTS

Figure 1. CLL Patients With and Without AF



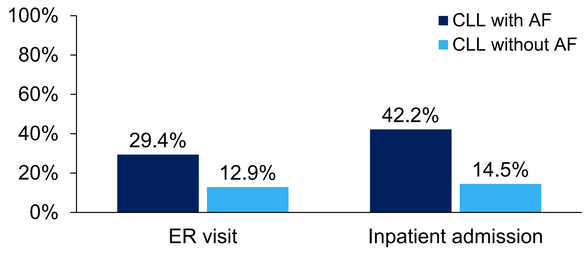
- **Clinical outcomes: Heart Failure, Bleeding, Stroke**
  - Significantly higher incidence of heart failure (26.3% vs 3.0%; *P*<.001), bleeding (12.2% vs 4.8%; *P*<.001) and stroke (6.6% vs 1.2%; *P*<.001) were observed in CLL patients with AF compared to CLL patients without AF (**Figure 2**)

Figure 2. Clinical Outcomes Among CLL Patients With and Without AF



- **Economic outcomes: Healthcare resource utilization**
  - CLL patients with AF were reported to have significantly higher rates of ER visits (29.4% vs 12.9%; *P*<.001) and hospitalizations (42.2% vs 14.5%; *P*<.001) than CLL patients without AF (**Figure 3**)

Figure 3. Healthcare Resource Utilization in CLL Patients With and Without AF



RESULTS

- **Economic outcomes: Costs**
  - In CLL patients with AF, the average total AF-related costs were $13,520.21 within 30 days after AF diagnosis, and $22,304.82 within 60 days after AF diagnosis
- **Multivariable regressions**
  - Controlling for demographics and comorbidities, multivariable regressions reported statistically significant associations between AF and heart failure, as well as AF and stroke (**Table 2**)

Table 2. Association Between AF and Clinical Outcomes

	Heart Failure	Bleeding	Stroke
	Odds Ratio (95% Confidence Interval)		
AF during the follow-up period			
Yes vs No	3.53 (3.04, 4.09)	1.15 (0.94, 1.40)	2.02 (1.57, 2.59)
Age (Ref = <65 years)			
≥65 vs <65	3.61 (3.10, 4.19)	1.55 (1.35, 1.77)	2.46 (1.94, 3.13)
Gender (Ref = female)			
Male vs Female	0.99 (0.87, 1.13)	0.94 (0.83, 1.07)	0.86 (0.70, 1.07)
Baseline CCI	1.63 (1.57, 1.68)	1.28 (1.23, 1.33)	1.42 (1.36, 1.49)

Abbreviations: CCI, Charlson comorbidity index; Ref, reference.

DISCUSSIONS

- Study limitations were inherent to the use of administrative claims databases in an observational study design

CONCLUSIONS

- This real-world study reported significantly higher incidence of heart failure, bleeding, and stroke incurred by CLL patients who developed AF compared with those who did not
- The presence of heart failure, bleeding, and stroke further increased HRU and costs
- These findings highlight the importance of better disease management and treatment selection to prevent AF in patients with CLL

REFERENCES

1. Jeyakumaran D et al. *Value in Health.* 2016;19(7):574-575
2. Milne K et al. *Curr Oncol Rep.* 2020;22(4):36.
3. Archibald WJ et al. *Ann Hematol.* 2021;100(1):143-55.

Presented at the Congress of the European Hematology Association, June 9-12, 2022; Vienna, Austria