# Factors Associated with Treatment Among Older Adults Diagnosed with Chronic Lymphocytic Leukemia: An Analysis Using Medicare Claims Data

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## Background and Objective

- Chronic lymphocytic leukemia (CLL) is the most common type of leukemia among adults in the US.
- New agents and treatment combinations have been approved for CLL.
- Limited information exists on current prescribing patterns or the characteristics of individuals receiving CLL treatment.
- Our objectives were to: 1) characterize CLL treatment patterns and timing of treatment; 2) identify factors associated with the receipt of CLL treatment.

## Methods

- Sample population and data source: Medicare beneficiaries diagnosed with CLL and identified using the 2017-2019 Chronic Conditions Data Warehouse.
- Selection criteria:
  - No treatment for CLL in the 6-month baseline period
  - Continuous enrollment in FFS Parts A, B, and D
  - Age 65 or older
- Follow up: from index date (date of first CLL claim) until loss of eligibility, death, or end of the study period.
- The CLL treatments, among others, include:
  - rituximab monotherapy
  - ibrutinib monotherapy
  - bendamustine/rituximab (BR)
  - obinutuzumab
- Visualization of treatment patterns: EventFlow visual analytics software (see *Notes*).
- Statistical analysis: descriptive statistics and logistic regression model of CLL treatment receipt with covariate-adjusted odds ratios (AOR).

## Results

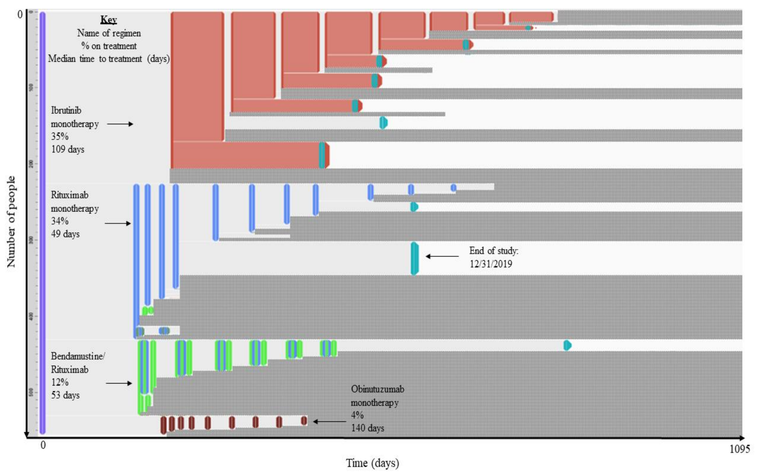
- Final sample: 3,440 individuals, of whom 16% (n=556) received CLL treatment. Median follow up: 540 days.
- Table 1 illustrates the demographic and clinical characteristics of the sample.
- The median (interquartile range, mean) time to receipt of CLL treatment was 61 (224, 166) days.
- Figure 1 illustrates treatments received and was developed using EventFlow.
  - EventFlow orders event sequences over individual observations on the y-axis beginning with the most prevalent event (at the top of the y-axis) and orders event sequences over time on the x-axis beginning with Day 0 (on the far left of the x-axis).
  - Less than half of the patients in the BR group completed six doses of BR.
- Age and gender (Table 2) were statistically significantly associated with treatment receipt.

**Table 1.** Demographic and clinical characteristics of Medicare beneficiaries diagnosed with CLL from 2017 – 2019 (N = 3,440)

| | All | | Receive any treatment during follow-up | | | |
|---|---|---|---|---|---|---|
| | | | No | | Yes | |
| | N | Col % | N | Col % | N | Col % |
| Sample size, row % | 3,440 | 100 | 2,884 | 84 | 556 | 16 |
| Age[a] | | | | | | |
| 65-74 | 1,399 | 41 | 1,160 | 40 | 239 | 43 |
| 75-84 | 1,341 | 39 | 1,110 | 38 | 231 | 42 |
| 85+ | 700 | 20 | 614 | 21 | 86 | 15 |
| Sex[a] | | | | | | |
| Female | 1,745 | 51 | 1,496 | 52 | 249 | 45 |
| Male | 1,695 | 49 | 1,388 | 48 | 307 | 55 |
| Race | | | | | | |
| White | 3,225 | 94 | 2,710 | 94 | 515 | 93 |
| Black | 124 | 4 | 100 | 3 | 24 | 4 |
| Other | 91 | 3 | 74 | 3 | 17 | 3 |
| Census region[a] | | | | | | |
| Northeast | 815 | 24 | 706 | 24 | 109 | 20 |
| Midwest | 873 | 25 | 740 | 26 | 133 | 24 |
| West | 589 | 17 | 481 | 17 | 108 | 19 |
| South and other | 1,163 | 34 | 957 | 33 | 206 | 37 |
| Urban/rural residence | | | | | | |
| Metro | 2,721 | 79 | 2,286 | 79 | 435 | 78 |
| Suburban | 642 | 19 | 538 | 19 | 104 | 19 |
| Rural | 77 | 2 | 60 | 2 | 17 | 3 |
| Part-D low-income subsidy status ever | | | | | | |
| No | 2,948 | 86 | 2,480 | 86 | 468 | 84 |
| Yes | 492 | 14 | 404 | 14 | 88 | 16 |
| Charlson Comorbidity Index at baseline | | | | | | |
| CCI 0 | 1,258 | 37 | 1,077 | 37 | 181 | 33 |
| CCI 1-2 | 1,190 | 35 | 990 | 34 | 200 | 36 |
| CCI 3+ | 992 | 29 | 817 | 28 | 175 | 31 |
| Use of preventive services at baseline | | | | | | |
| No | 207 | 6 | 179 | 6 | 28 | 5 |
| Yes | 3,233 | 94 | 2,705 | 94 | 528 | 95 |

[a] Indicates statistically significant difference between groups (P < .05).

**Figure 1.** EventFlow characterization of CLL treatment patterns in the US Medicare population




## Notes

Access the QR code for more information: "EventFlow: Visual Analysis of Temporal Event Sequences and Advanced Strategies for Healthcare Discovery".

## Results (cont.)

**Table 2.** The association between baseline measures and receipt of treatment among Medicare beneficiaries diagnosed with CLL

| Factors | AOR (95% CI) | P-value |
|---|---|---|
| Age category | | |
| 65-74 | Reference | |
| 75-84 | 1.00 (0.82, 1.23) | 0.07 |
| 85+ | 0.69 (0.53, 0.91) | <0.01 |
| Sex | | |
| Female | Reference | |
| Male | 1.28 (1.06, 1.54) | <0.01 |
| Race | | |
| White | Reference | |
| Black | 1.17 (0.73, 1.88) | 0.74 |
| Other | 1.13 (0.65, 1.98) | 0.87 |
| Region | | |
| South and other | Reference | |
| Midwest | 0.88 (0.69, 1.13) | 0.32 |
| Northeast | 0.83 (0.63, 1.10) | 0.13 |
| West | 1.16 (0.88, 1.53) | 0.05 |
| Urban residence | | |
| Metro | Reference | |
| Suburban | 0.81 (0.61, 1.08) | 0.15 |
| Rural | 1.12 (0.63, 2.00) | 0.45 |
| Low-income subsidy status | | |
| No | Reference | |
| Yes | 1.15 (0.87, 1.50) | 0.33 |
| CCI score | | |
| 0 | Reference | |
| 1-2 | 1.20 (0.96, 1.50) | 0.42 |
| 3+ | 1.23 (0.97, 1.57) | 0.27 |
| Use of preventive services | | |
| No | Reference | |
| Yes | 1.10 (0.72, 1.67) | 0.67 |

## Conclusions

- Among Medicare beneficiaries diagnosed with CLL, the most common treatments administered were ibrutinib and rituximab.
- Younger age and male gender were associated with higher odds of receiving CLL treatment.

## Contact Information

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