Population-Wide Patterns of Care in CLL in Australia: an Analysis of the Pharmaceutical Benefits Scheme Data Set

Constantine S. Tam[1,2], Fei-Li Zhao[3], Raj Gauba[3], Keri Yang[4], Shu Chuen Li[5], Boxiong Tang[4]

[1]The Alfred Hospital, Melbourne, VIC, Australia; [2]Monash University, Clayton, VIC, Australia; [3]BeiGene AUS PTY Ltd., NSW, Australia; [4]BeiGene USA, Inc., San Mateo, CA, USA; [5]University of Newcastle, NSW, Australia

INTRODUCTION

- The treatment landscape for Australian patients with chronic lymphocytic leukemia (CLL) is changing due to approvals of novel targeted therapies
- One such novel therapy for CLL is ibrutinib, a Bruton tyrosine kinase inhibitor (BTKi)
  - In 2016, ibrutinib was approved for relapsed/refractory (R/R) CLL in Australia[1]
  - In December 2017, ibrutinib treatment for R/R CLL was listed with the Pharmaceutical Benefits Scheme (PBS), a program run by the Australian government that subsidizes selected prescription drugs[2]
- Data pertaining to all publicly funded medications dispensed by the PBS is collected by the Australian Department of Health for monitoring, evaluation, and health services planning purposes; deidentified data are available to the public, with more detailed data sets available to researchers upon request
  - The PBS 10% sample is one such set of research data that contains a standardized, longitudinal extract of PBS dispensing records from a random 10% sample of Australians[3]
- To understand the impact of the introduction of novel, publicly funded drugs as treatment for CLL in Australia, this study aimed to describe evolving CLL treatment patterns over the last 10 years using population-wide prescription records

METHODS

- This is a retrospective, observational study using the PBS 10% sample data set; data was extracted on patients who initiated treatment for CLL between January 1, 2011, and July 31, 2021
  - The index date for each patient was defined as the first date that the index treatment (ie, the first qualifying prescription for CLL during the identification period) was dispensed
  - First-line (1L) therapy was defined as the first treatment prescribed for CLL
  - Subsequently, a patient was considered to have R/R disease if they started treatment with a drug in a different therapeutic category or if they restarted the same drug after a gap of >180 days
- Descriptive analyses were conducted to examine the use of treatment drugs over 10 years in the overall population by line of therapy

RESULTS

- From January 1, 2011, through July 31, 2021, 803 patients in the PBS 10% data set initiated treatment for CLL and met all other study criteria
- The majority of patients were men (65%), and most were ≥60 years of age (77%), with the largest group being 70 to 79 years of age (33% of total; **Table 1**)
  - Many patients were receiving comedications at baseline, including antihypertensives (47%), antipsychotics or antidepressants (17%), and/or anticoagulants (13%)

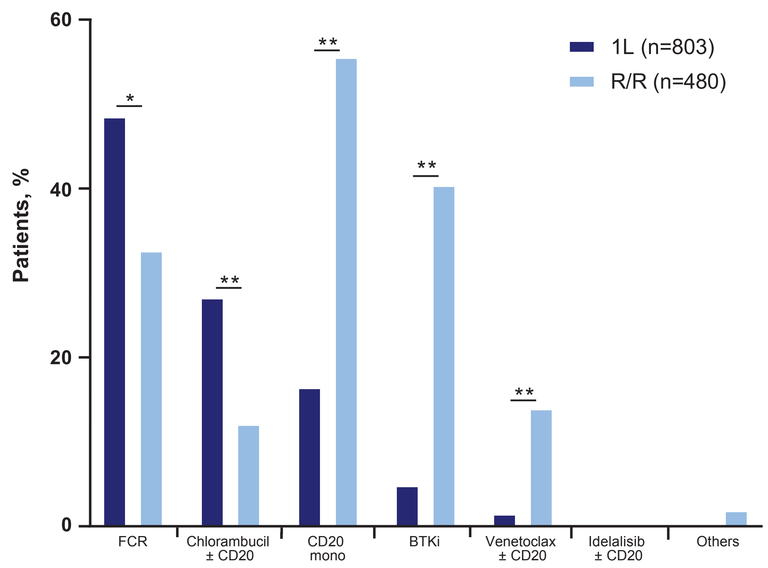
Table 1. Characteristics of Australian Patients With CLL From the PBS 10% Data Set (January 2011 - July 2021)

	All patients (N=803)
Age at index date[a]	
Mean (SD), y	68.3 (12.5)
Median (range), y	70 (6-94)
Age ranges, n (%)	
0-59 y	182 (22.7)
60-69 y	209 (26.0)
70-79 y	263 (32.8)
80+ y	149 (18.6)
Sex, n (%)	
Women	284 (35.4)
Men	519 (64.6)
Comedications at baseline, n (%)	
Antihypertensives	374 (46.6)
Anticoagulants	107 (13.3)
Antiplatelets	46 (5.7)
Antiarrhythmics	20 (2.5)
Antidiabetics	87 (10.8)
Antipsychotics/antidepressants	134 (16.7)

[a]Defined as the start date of any CLL treatment.
CLL, chronic lymphocytic leukemia; PBS, Pharmaceutical Benefits Scheme.

- For all patients over the 10-year period, treatment patterns for 1L and R/R disease were as follows (**Figure 1**):
  - Fludarabine-cyclophosphamide-rituximab (FCR) was used in 49% of patients with 1L disease and 33% of those with R/R disease
  - Chlorambucil with or without CD20 was used in 27% of patients with 1L disease and 12% of those with R/R disease
  - CD20 monotherapy was used in 17% of patients with 1L disease and 56% of those with R/R disease
  - BTKis were used in 5% of patients with 1L disease and 41% of those with R/R disease
  - Venetoclax with or without CD20 was used in 2% of patients with 1L disease and 14% of those with R/R disease

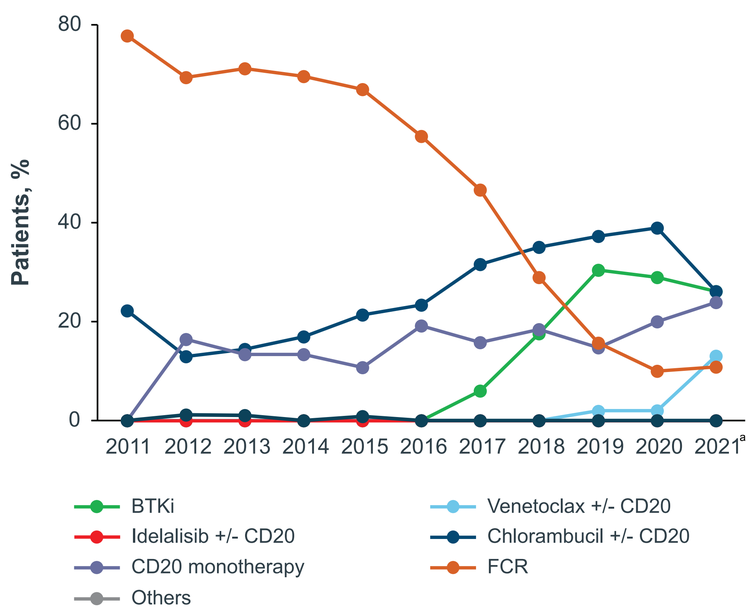
Figure 1. CLL Treatment Patterns in the PBS 10% Data Set (January 2011 - July 2021)



1L, first line; BTKi, Bruton tyrosine kinase inhibitor; CLL, chronic lymphocytic leukemia; FCR, fludarabine-cyclophosphamide-rituximab; mono, monotherapy; PBS, Pharmaceutical Benefits Scheme; R/R, relapsed/refractory.
*$P<.0001$; **$P<.00001$.

- From 2011 to 2021, a trend in adoption of novel agents for 1L therapy to treat CLL was observed following their PBS listing (**Figure 2**)
  - BTKi use increased from 0% to 26%
  - Use of venetoclax with or without CD20 increased from 0% to 13%
- Within the same period, use of FCR as 1L therapy for CLL decreased from 78% to 11%
- Ibrutinib is PBS listed for treatment of R/R CLL only, but 41 patients with no history of CLL treatment had prescriptions for ibrutinib and were thus considered 1L users; two potential circumstances might explain these observations of BTKi use:
  - (1) These patients could have received previous treatment with ibrutinib from clinical trials or for compassionate use and continued the prescription within the PBS system, thus it was considered 1L based on the availability of data from the PBS for this analysis
  - (2) These patients received 1L treatment for CLL prior to 2006, when PBS 10% data collection began

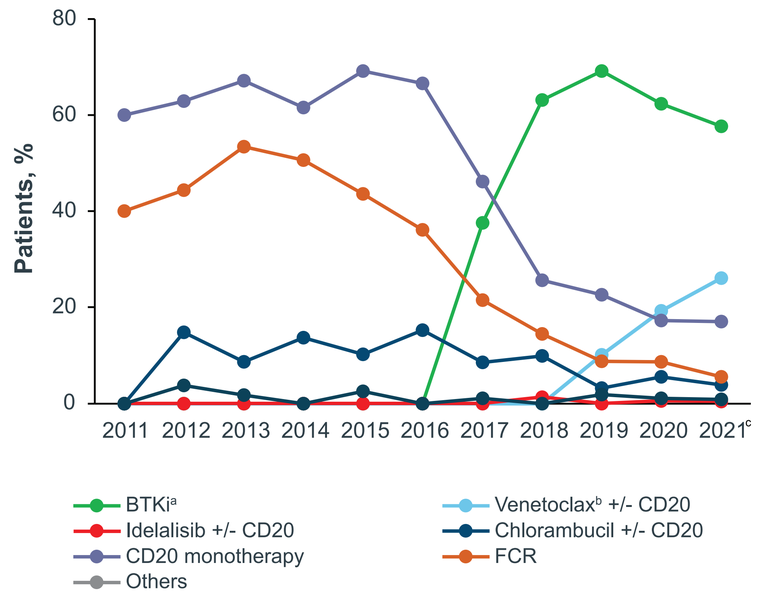
Figure 2. 1L CLL Treatment Patterns From the PBS 10% Data Set (January 2011 - July 2021)



1L, first line; BTKi, Bruton tyrosine kinase inhibitor; CLL, chronic lymphocytic leukemia; FCR, fludarabine-cyclophosphamide-rituximab; PBS, Pharmaceutical Benefits Scheme.
[a]Data for 2021 ended in July.

- From 2011 to 2021, use of novel drugs to treat patients with R/R CLL also increased after their PBS listing (**Figure 3**)
  - BTKi use increased from 0% to 58%
  - Use of venetoclax with or without CD20 increased from 0% to 26%
- Over the same period, use of CD20 monotherapy for R/R disease decreased from 60% to 17%

Figure 3. R/R CLL Treatment Patterns From the PBS 10% Data Set (January 2011 - July 2021)



BTKi, Bruton tyrosine kinase inhibitor; CLL, chronic lymphocytic leukemia; FCR, fludarabine-cyclophosphamide-rituximab; PBS, Pharmaceutical Benefits Scheme; R/R, relapsed/refractory.
[a]Ibrutinib was listed on the PBS in December 2017; [b]Venetoclax was listed on the PBS in March 2019; [c]Data for 2021 ended in July.

CONCLUSIONS

- CLL treatment patterns have changed substantially in Australia since the introduction of novel therapies, including BTKis
- Use of FCR as a 1L treatment for CLL has decreased, while use of novel therapies such as BTKis for R/R CLL has increased
- Limitations of this analysis included the likelihood of missing data since the PBS 10% data set tracked data back to only 2006; also, potential errors in data entry (eg, wrong authority code for a given drug since International Classification of Disease numbers were not provided) may have affected the selection of eligible patients

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CORRESPONDENCE

fei-li.zhao@beigene.com

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DISCLOSURES

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F-LZ, RG, KY, and BT: employees of BeiGene, Inc. and may own company stock or stock options.

SCL: no competing interests.

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