

## **Evaluation of treatment and safety patterns in patients with chronic lymphocytic leukemia (CLL) using natural language processing (NLP): Perspective of a multicenter observational study in Spain**

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**Introduction:** Targeted treatment has improved outcomes for patients with CLL. In Spain, there is a lack of studies to evaluate treatment and safety patterns in real life. The NLP applied to the electronic medical records (EMR) can contribute to improve the understanding of the treatment of CLL in Spain.

**Aim:** To understand treatment patterns and safety in patients diagnosed with CLL in Spain through NLP applied to EMRs.

**Materials and Methods:** A retrospective, multicenter, observational study of all adult patients diagnosed with CLL between January 1, 2016 and December 31, 2021 in three Spanish hospitals was carried out using secondary analysis of free text and structured clinical information from EMRs. Patients diagnosed with Richter syndrome or prolymphocytic leukemia were excluded. EMRs were assessed using NLP based on clinical terminology (SNOMED-CT) and machine learning. Unstructured clinical information related to clinical characteristics and treatment was evaluated. A total of 205 clinical variables of interest were obtained and summarized using descriptive statistical methodology.

**Results:** 697 pts were selected that met the inclusion criteria of 2,069,361 reviewed pts in a total of 88,872,628 EMR. Of these, 406 (58.2%) patients underwent a watch-and-wait approach and 291 (41.8%) received treatment: all had received first-line treatment (1L), 98 (33.7%) received second-line treatment (2L) and 28 (9.6%) received at least one third-line treatment (3L). The most prescribed treatments for 1L and 2L were BTK inhibitors (iBTK) (30.6% and 40.8%; ibrutinib was used in 96% and 98%) and chemoimmunotherapy (QI) (39.2% and 20.4%), respectively. In 3L, inhibitors of BCL2 (iBCL2) (35.7%), iBTK (28.6%) and QI (14.3%) were used. Treatment discontinuation occurred in 67 patients (23%) in 1L, 37 (37.8%) in 2L, and 13 (46.4%) in 3L. In 1L, the most common reason for discontinuation was toxicity. Significant side effects such as atrial fibrillation, high blood pressure, and pneumonia were observed. Progression was the most frequent reason for treatment discontinuation in 2L (iBCL2, 75%; iBTK, 50%).

**Conclusion:** The NLP applied to EMRs complements the literature on prospective clinical trials of patients with CLL. Nearly 50% of patients receive 1L treatment and up to 10% receive at least 3L. Relevant treatment discontinuation rates occur in all groups, and toxicity is a significant cause of treatment discontinuation. This highlights the need for new, less toxic alternatives.