Number-needed-to-treat analyses of zanubrutinib in relapsed/refractory chronic lymphocytic leukemia

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Background: Chronic lymphocytic leukemia (CLL) is the most common leukemia type, with an annual incidence of 4.9 per 100,000 in the US. In 2020, an estimated 207,463 people were living with CLL. Zanubrutinib is a Bruton tyrosine kinase inhibitor that is FDA approved for CLL. In the phase 3 ALPINE trial (NCT03734016), zanubrutinib elicited a significantly higher overall response rate and significantly longer progression-free survival (PFS) than ibrutinib.

ABSTRACT

Objectives: This study aimed to compare zanubrutinib vs ibrutinib in relapsed/refractory (R/R) CLL by calculating the number needed to treat (NNT) to avoid 1 event of disease progression or death and associated incremental costs.

Methods: A health-economic model was developed to evaluate the number of patients with R/R CLL who needed treatment to avoid progression or death from the US payer perspective. Payer blend was assumed to be 40% commercial and 60% Medicare. Clinical efficacy data were extracted from the ALPINE trial. The 24-month PFS from the final study analysis (zanubrutinib, 79.5%; ibrutinib, 67.3%) was used for the model base-case analysis. The model considered costs of treatment, adverse event management, medical resource utilization, and subsequent treatment. The model captured the NNT, incremental cost per treated patient, and incremental cost per additional patient who experienced progression or died. Deterministic sensitivity analyses were conducted to assess parameter uncertainties and key model drivers. The impact of different PFS estimates was tested in scenario analyses.

Results: The base-case results from the NNT model showed that for every 8 patients treated, 1 event of progression or death would be avoided with zanubrutinib compared with ibrutinib. The total costs per patient treated with zanubrutinib and ibrutinib were $370,558 and $430,150, respectively, with a cost savings of $59,593 per zanubrutinib-treated patient in a 24-month time frame. Drug costs and PFS had major impacts on the incremental cost per patient. Varying the PFS scenarios (including adjustment for drug interruption, COVID-19–related death, or treatment discontinuation) changed the NNT from 8 to 12 patients and was associated with a cost savings of $58,179 to $67,153 per patient treated with zanubrutinib. Applying the model results to a hypothetical clinical practice of 100 patients treated with zanubrutinib vs ibrutinib suggested that approximately 13 patients would avoid events of disease progression or death.

Conclusions: This NNT model suggests that treating patients with R/R CLL with zanubrutinib, vs ibrutinib, results in more favorable clinical and economic outcomes in the US.