Efficacy and Safety of Asciminib Compared With Other TKIs in CML: Meta-Analysis of Controlled Studies and Descriptive Review of Single-Arm Cohorts

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Introduction

Asciminib is a novel, first-in-class STAMP (Specifically Targeting the ABL Myristoyl Pocket) inhibitor of BCR::ABL1 that has shown efficacy in both heavily pretreated and treatment-naïve patients with chronic myeloid leukemia (CML).

Objectives

To assess the efficacy and safety of asciminib compared with other tyrosine kinase inhibitors (TKIs) through a meta-analysis of controlled studies and a systematic review of single-arm studies.

Methods

PRISMA guidelines were followed, and a comprehensive literature search was performed on PubMed, Cochrane, and Embase databases up to March 2025.

From 611 articles, meta-analysis of three controlled studies and a systematic descriptive review of nine single-arm studies were conducted. International clinical trials and real-world observational cohorts were included in this review.

Risk of bias was assessed using the Cochrane Risk of Bias assessment tool.

Inclusion criteria were patients with chronic-phase CML, predominantly pretreated, including subsets with the *T315I* mutation. In studies included in meta-analysis, patients received asciminib monotherapy or comparator TKIs (eg, imatinib, bosutinib, ponatinib, or investigator's choice). Studies with combination therapies were excluded. Outcomes were assessed across randomized, matched, and observational designs. R software was used for statistical analysis.

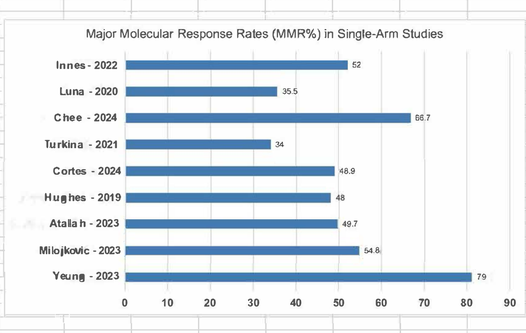


Figure 3 – MMR Rates in Single-Arm Studies

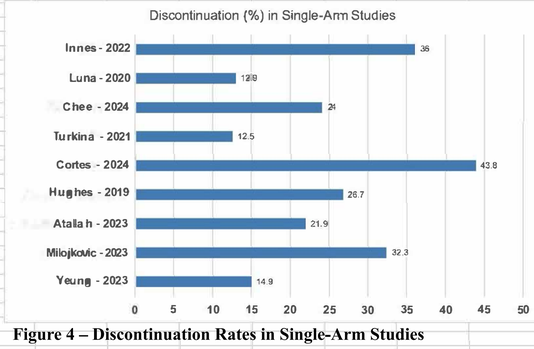


Figure 4 – Discontinuation Rates in Single-Arm Studies

Results

Three studies (ASCEMBL, ASC4FIRST, and a propensity score–matched cohort; n≈796) with follow-up durations of 24 to 52 weeks were analyzed using random effects model.

Meta-analysis showed that asciminib improved major molecular response (MMR) rates compared with control TKIs (risk ratio, 1.37; 95% CI, 1.19–1.58; I^2=0.0%). Grade ≥3 adverse events were lower with asciminib (odds ratio, 0.66; 95% CI, 0.47–0.91; I^2=0.0%).

Nine single-arm studies (n=568) reported MMR rates ranging from 34% to 79%, assessed at 24 to 96 weeks, with lower MMR seen in *T315I*-mutated cohorts. Discontinuation rates ranged from 12% to 43%, predominantly due to intolerance or disease progression. Overall, asciminib displayed a favorable safety profile across populations.

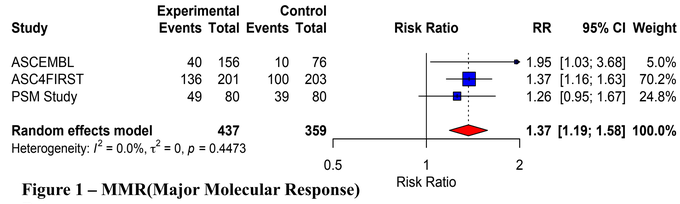


Figure 1 – MMR(Major Molecular Response) Rates

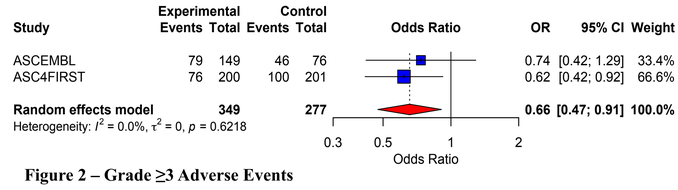


Figure 2 – Grade ≥3 Adverse Events

Conclusion

Asciminib offers superior efficacy and lower adverse events compared with other TKIs in controlled studies, while also showing consistent performance across real-world cohorts. These results support the growing role of asciminib in CML management, including in *T315I*-mutated disease. However, further prospective studies are needed to establish its use as a frontline therapy.

References

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