An Evaluation Of Adverse Effects In Patients Receiving Tyrosine Kinase Inhibitor Therapy During The Chronic Phase Of Chronic Myeloid Leukemia: A Single-center Experience

A. TURUNÇ [1], Y.B. ÇUBUKÇU [1], E. GÜRKAN[1]
1. Çukurova University, Adana, Turkey

Introduction

Chronic myeloid leukemia (CML) is a hematopoietic stem cell disorder characterized by abnormal clonal proliferation of myeloid progenitor cells. International guidelines recommend that the choice of first-line therapy should be guided by various factors, including disease risk, adverse effect profile, cost, and comorbidities

Aim

In this analysis, we report our center's experience with tyrosine kinase inhibitor (TKI)-related adverse effects in patients diagnosed with CML and actively followed in our hematology clinic.

Objectives

To evaluate the frequency and characteristics of severe (Grade 3–4) adverse effects associated with tyrosine kinase inhibitor (TKI) therapy in patients with chronic-phase chronic myeloid leukemia followed at a single tertiary center.

Methods

Patients diagnosed with chronic-phase CML and under active follow-up at the Department of Hematology, Çukurova University, between 2020 and 2025 were retrospectively reviewed. In total, 127 patients who received TKI therapy were identified. Only adverse effects classified as Grade 3–4 according to the World Health Organization toxicity grading criteria were included.

Table 1. Methodological Framework

Parameter	Description
Study design	Retrospective, single-center analysis
Study period	2020 – 2025
Setting	Department of Hematology, Çukurova University
Patient population	127 patients diagnosed with chronic-phase CML
Intervention	Tyrosine kinase inhibitor (TKI) therapy (Imatinib, Dasatinib, Nilotinib, Bosutinib, Ponatinib)
Outcome measures	Grade 3–4 adverse effects (WHO toxicity grading criteria)

Results

Of the 127 patients included in the study, 49% (n=62) received imatinib, 25% received dasatinib (n=32), 16% received nilotinib (n=20), 7.5% received bosutinib (n=10), and 2.5% received ponatinib (n=3). Adverse effects were observed in 27% of the patients (n=34). Pericardial effusion occurred in 8 patients, of whom 7 were on dasatinib and 1 was on imatinib. Pleural effusion was identified in another 8 patients, 6 receiving dasatinib and 2 receiving imatinib. Severe cutaneous eruptions were noted in 3 patients: 2 on imatinib and 1 on nilotinib. Toxic hepatitis developed in 3 patients: 2 on imatinib and 1 on dasatinib. Peripheral edema was observed in three patients, all of whom were receiving imatinib. Acute coronary syndrome was reported in two patients, both of whom were treated with nilotinib. Severe nausea and vomiting occurred in two patients, both of whom were on imatinib. Cardiac arrhythmias were identified in 2 patients: 1 on bosutinib and 1 on nilotinib. Additional serious events included ischemic stroke (n=1, nilotinib), pulmonary hypertension (n=1, dasatinib), and severe diarrhea (n=1, bosutinib).

Summary

The primary goal of tyrosine kinase inhibitor (TKI) therapy in chronic myeloid leukemia (CML) is to achieve optimal antitumor efficacy while minimizing treatment-related toxicities. Awareness of potential adverse effects is an essential aspect of safe and effective TKI use.

Discussion

Regular monitoring, early recognition, and timely management of adverse events, especially those frequently encountered, may improve treatment continuity and facilitate long-term therapeutic success, ultimately leading to better patient outcomes.

References

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