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632.CHRONIC MYELOID LEUKEMIA: CLINICAL AND EPIDEMIOLOGICAL

Sars-Cov-2 and Chronic Myeloid Leukemia: A Systematic Review

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Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the virus causing the coronavirus disease of 2019. Numerous mutations had developed in SARS-CoV-2 virus that resulted in strains (Alfa Beta Delta Omicron) with varying degrees of virulence disease severity. In coronavirus disease of 2019 (COVID-19) patients with chronic myeloid leukemia (CML), there is a controversy regarding the effect of tyrosine kinase inhibitors (TKI) on SARS-CoV-2 infection and patients' outcomes. Some studies showed that CML patients with COVID-19 had better outcomes; other reports showed no significant difference.

Method

Following the PRISMA (preferred reporting items for systematic reviews and meta-analyses) guidelines, PubMed, Scopus, and Google Scholar databases were searched for published articles through 20 April 2023 for qualified studies. The search included retrospective, prospective studies, reviews, case series, and case reports. The inclusion criteria were English literature with CML patients above 18 years who had SARS-CoV-2 infection. Articles in languages other than English and articles with non-sufficient information were excluded, and patients with bone marrow transplants were excluded. Search terms were (chronic myeloid leukemia) OR (chronic myelogenous leukemia) AND (SARS-CoV-2) OR (COVID-19). Two eligibility checks were done on the included studies. Title and abstract screening was completed first, and the full text of articles that met the requirements for inclusion was subsequently obtained. The search included all articles published up to 20 April 2023. The review is registered in PROSPERO (registration number is: CRD42022326674).

Results

We reviewed 36 articles of published literature up to April 2023 and collected data for a total of 686 CML patients with COVID-19. The vast majority of patients were in the chronic phase; seven patients were in the accelerated phase, and eight patients were in the blast phase. Disease severity was classified according to WHO criteria. Twenty-seven patients were managed at home, and 21 patients were in ICU (intensive care unit) during the hospital course. Twenty-six patients required oxygen therapy; among them, seven patients required intubation and mechanical ventilation, and six patients required non-invasive ventilation. Mortality was seen in 47 patients, and there were no reports of thrombotic events, but some patients developed AKI, autoimmune hemolytic anemia, rhabdomyolysis, and DKA during COVID-19.

Limitations

The major limitation is the lack of details about the use or hold of TKIs during SARS-CoV-2 infection in the majority of the reports. Also, the specific or predominant strain of SARS-CoV-2 was not mentioned. Few studies mentioned the variant of the virus, which make it difficult to compare the outcome of the different variant of the SARS-CoV-2 virus in patients with CML.

Discussion/Conclusions

Hematological cancers are associated with an increased risk of thrombosis. Thrombosis risk is expected to increase in patients with COVID-19; interestingly, patients with CML have not been reported to have a significant increase in the risk of thrombosis during COVID-19. The crucial point is, does TKI continuation during COVID-19 beneficial or harmful? Few patients continued TKIs during Covid-19 without serious adverse events. For patients who had the TKI continued, there were no mortality or serious adverse events. In vitro, TKIs were found to have a significant effect on inhibiting viral replication, which might be the

reason behind the better outcome in CML patients infected with SARS-CoV-2 virus. On the other hand, there is a theoretical risk of increased severe infection in CML patients taking TKI due to targeted inhibition of kinases involved in immune cell function. This might result in suppressed cellular immune response that facilitates viral replication. Despite that, CML patients with COVID-19 have no significant increase in mortality or ICU admission compared to other hematological malignancies. in fact, our review showed that the mortality of CML patients with COVID-19 has significantly improved from 0.12% in the pre-vaccination period to 0.04% in the post-vaccination era. The available data indicates that, COVID-19's effect on patients with chronic myeloid leukemia (CML) still needs to be better understood due to the limited data.

Disclosures No relevant conflicts of interest to declare.

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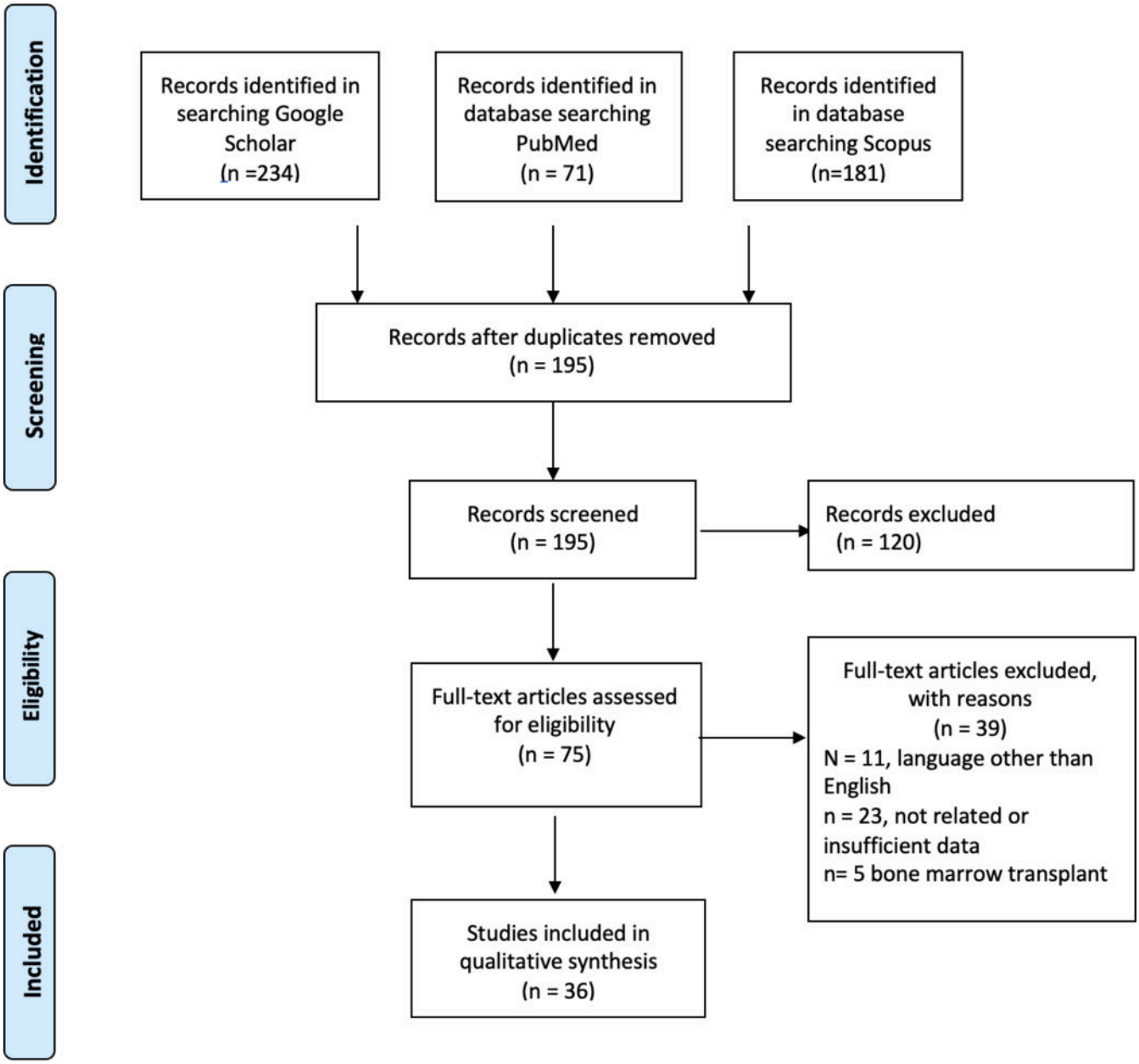
Figure 1



The PRISMA flow diagram detailing articles screening of chronic myeloid leukemia patients with SARS-CoV-2.

Figure 1