Epidemiological Insights Into Chronic Myelomonocytic Leukemia: A Real-World Evidence Study Using the TriNetX Network

Ahmad Basharat MD , Hafiz Muhammad Hannan Javed MD , Nouman Aziz MD , Afifa Aslam MD , Zainab Rauf MBBS , Alissa Marr MD , Moazzam Shahzad MD Marshfield Clinic Health System, Marshfield, WI, USA. Tidal Health Peninsula Regional Medical Center, Salisbury, MD, USA. Wyckoff Heights Medical Center, Brooklyn, NY, USA. KIng Edward Medical University, Lahore, Punjab, Pakistan. University of Nebraska Medical Center, Omaha, NE, USA. University of South Florida Morsani COM H. Lee Moffitt Cancer Center and Research Institute, Tampa, FL, USA

Introduction

Chronic Myelomonocytic Leukemia (CMML) is a rare clonal hematopoietic malignancy combining features of both myelodysplastic and myeloproliferative neoplasms. Given its clinical heterogeneity and low incidence, large-scale real-world data are scarce. This study aimed to evaluate the epidemiology, comorbidity burden, treatment patterns, and outcomes of CMML patients using a federated, multi-institutional real-world database.

Methods

We conducted a retrospective cohort study using the TriNetX Research Network, which aggregates de-identified electronic health records from over 150 healthcare organizations worldwide. Adult patients (≥18 years) with a diagnosis of CMML (ICD-10: D47.Z2) between January 1, 2005, and December 31, 2023, were included. Patient demographics, comorbidities, cytopenia's, treatments, complications, and outcomes were analyzed using descriptive statistics and Kaplan–Meier survival curves.

Results

1. A total of 12,637 adult patients with CMML were identified. The median age at diagnosis was 72 (IQR: 65–79) years, with 60.8% males.
2. Racial distribution included 70.5% White, 15.2% Black, 8.1% Hispanic, and 6.2% Asian or other.
3. Comorbidities included hypertension (58.7%), coronary artery disease (29.9%), diabetes (27.3%), chronic kidney disease (19.6%), and chronic obstructive pulmonary disease (14.5%). Anemia was noted in 65.8%, thrombocytopenia in 34.4%, and splenomegaly in 23.5%. Hypomethylating agents were used in 35.2%, hydroxyurea in 39.1%, and only 3.9% underwent hematopoietic stem cell transplantation.
4. Febrile neutropenia occurred in 12.5%, and intensive care unit admission was required in 28.9%. Median overall survival was 26.8 (95% CI, 25.6–28.1) months, with 1- and 3-year survival rates of 65.4% and 37.6%, of respectively. Hospitalization within 90 days diagnosis occurred in 40.3%, with a mean hospital stay of 7.9 days. Use of hypomethylating agents correlated with improved survival ($P<0.01$).

Discussion

In this large, real-world cohort, CMML primarily affected older adults with substantial comorbidity and cytopenia burden. Curative therapies remain underused. These findings underscore the need for early risk stratification and expanded access to disease modifying interventions.