Tracking the Rising Burden of Major Cardiovascular Diseases–Related Mortality Among Chronic Myeloid Leukemia Patients: Epidemiological Trends and Disparities in United States Adults Aged 25 and Above (2010–2020)

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Keywords

Chronic Myeloid Leukemia, Cardiovascular Disease, CDC Wonder, Epidemiology

Context

Recent advances, particularly the use of tyrosine kinase inhibitors (TKIs), have transformed Chronic Myeloid Leukemia (CML) from a fatal malignancy to a manageable chronic condition. However, CML patients continue to have a higher risk of cardiovascular disease (CVD), most likely as a result of the treatment's cumulative cardiotoxic effects. Additionally, population-level data on CVD trends among CML patients remain limited.

Objectives

To examine the prevalence of major CVDs (ischemic heart diseases, heart failure, hypertensive heart disease, cerebrovascular disease) among individuals diagnosed with CML, and to assess disparities by age, gender, race, urbanization level, and U.S. census region

Methods

This retrospective study utilized national health datasets from CDC WONDER utilizing the ICD-10 codes, to identify individuals aged ≥ 25 diagnosed with CML (C92.1) and major CVDs (I10-15, I20-25, I50, I60-69) in the United States during 2010 to 2020. Stratified analyses were performed by gender, race, urbanization, census region, and age groups (45–64, 65+). Trends were assessed using Joinpoint regression analysis to calculate Annual Percent Changes (APC) and Average Annual Percent Changes (AAPC) with 95% confidence interval (CI).

Conclusion

Cardiovascular mortality linked to CML has considerably increased across all demographic and geographic groupings. These results underline the need for targeted interventions to address the new cardiovascular risks in CML patients.

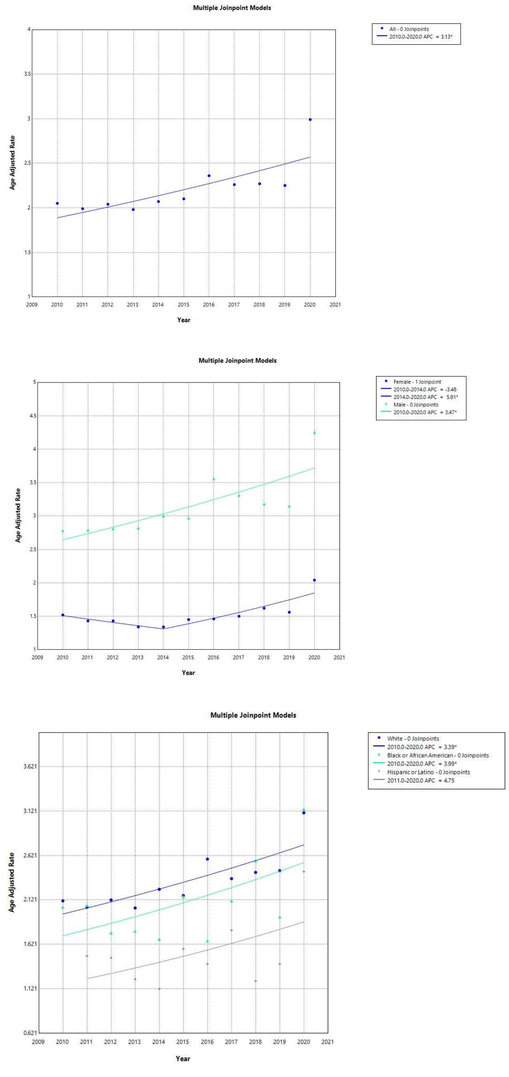
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Results

Between 2010 and 2020, 5,831 deaths from major CVDs occurred among individuals with CML, with an overall increase in age-adjusted mortality rates (AAMRs) (AAPC: 3.13%, 95% CI: 1.28–5.01). Males had higher AAMRs and a greater AAPC (3.47%, 95% CI: 1.50–5.47), while in females, a significant increase in mortality began after 2014 (APC: 5.91%, 95% CI: 1.75–10.2). Racially, Hispanics showed the steepest rise in mortality (AAPC: 4.75%, 95% CI: –0.93 to 10.7), while Whites consistently had higher AAMRs. When stratified by urbanization, non-metropolitan areas had higher AAMRs compared to metropolitan areas, with an almost similar AAPC (3.24% vs. 3.27%). Regionally, the Midwest had the highest AAMRs, while the Northeast showed the greatest increase (AAPC: 4.51%, 95% CI: 0.83–8.33). By age, Individuals aged 45–64 exhibited a sharper rise in mortality (AAPC: 5.93%, 95% CI: 3.14–8.80).

Major Cardiovascular Diseases–Related Mortality Among Chronic Myeloid Leukemia Patients in the United States



AAMR: Age-adjusted Mortality Rate, AAPC: Average Annual Percent Change, NH: Non-Hispanic