Trends and Disparities in Renal Disease–Related Mortality Among Adults with Myeloproliferative Neoplasms in USA

Mohamed Fawzi Hemida MBBS[1], Alyaa Ahmed Ibrahim MBBS[1], Abdelrahman Mohamed MBBS[1], Sahil Jairamani MBBS[2]

1. Alexandria Faculty of Medicine, Alexandria, Egypt.
2. Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan.

Context

Myeloproliferative neoplasms (MPNs) often lead to renal complications, yet trends in renal-related mortality remain understudied. This analysis examines two-decade mortality patterns and disparities in MPN patients, addressing critical gaps in understanding outcomes for this high-risk population.

Objectives

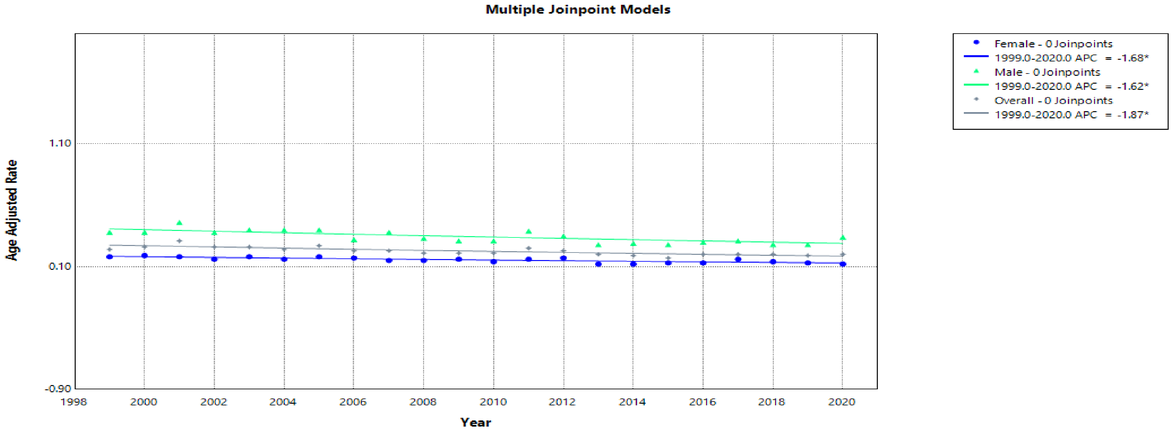
To analyze renal disease-related mortality trends and disparities among US adults with myeloproliferative neoplasms (1999–2020).

Methods

This retrospective study analyzed death certificate data from the CDC-WONDER database spanning 1999 to 2020, focusing on Myeloprolifrative neoplasms (ICD-10: C92.1, D45, D47.1, D47.3, D47.4) and renal disease (ICD-10: N17- N19, N28.9) as underlying causes of mortality in the U.S. population. Crude mortality rates (CMR) and age-adjusted mortality rates (AAMR) per 100,000 population were calculated. JoinPoint analysis was performed to estimate annual percent change (APC) and average annual percent change (AAPC) in mortality trends.

Results

Between 1999-2020, renal disease caused 11,024 deaths among US adults with myeloproliferative neoplasms, with AAMR declining significantly from 0.24 to 0.20 per 100,000 (APC=-1.87%; p<0.00001). This improvement was consistent across sexes, with females (APC=-1.68%) and males (APC=-1.62%) showing similar reductions. Geographic analysis revealed the South accounted for the most deaths (31.5%) but had the lowest AAMR (0.18) and steepest decline (APC=-2.11%), while the Midwest had the highest AAMR (0.26) but minimal improvement (APC=-0.64%; p=0.072). The Northeast showed rapid early decline (1999-2013: APC=-4.33%) followed by stagnation. Significant disparities emerged across demographic groups. Hispanic/Latino patients experienced the greatest mortality reduction (APC=-3.92%), followed by Black (APC=-2.25%) and White patients (APC = -1.56%). Younger adults (45-64 years) showed dramatic improvements (APC=-5.91%) compared to slower progress in older adults (65+ years: APC = -1.52%). Urban-rural divides were evident, with metropolitan areas maintaining steady declines (APC=-1.85%) while non-metropolitan areas saw initial reductions (1999-2015: APC=-2.56%) followed by recent increases (2015-2020: APC = 3.98%; p=0.128). Most deaths occurred in medical facilities (64.2%), primarily inpatient settings, with 20.3% at home and 14.9% in nursing homes, and notably low hospice utilization (4.6%).



Conclusion

While renal disease mortality in myeloproliferative neoplasm patients declined overall (1999–2020), persistent disparities by region, race/ethnicity, age, and rurality highlight unmet needs particularly in older adults, non-metropolitan areas, and end-of-life care access.

Keywords

Myeloproliferative Neoplasms; Renal Disease; Mortality; Disparities; CDC WONDER

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