Renal failure–related mortality in Multiple Myeloma: United States trends from 1999 to 2020

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Background

Renal failure is a common and serious complication of multiple myeloma (MM), affecting up to 20–40% of patients at diagnosis and significantly contributing to early mortality. MM causes the deposition of monoclonal light chains in kidney tubules and glomeruli. Advances in supportive care, such as earlier recognition of renal impairment, aggressive hydration, and use of novel myeloma agents, have improved renal recovery and overall survival.

Aim

This study aims to explore changes in trends and patterns in renal failure mortality among multiple myeloma patients in the US from 1999 to 2020.

Methods

Data was extracted from the CDC WONDER database. Age-adjusted mortality rates (AAMRs) per 100,000 persons were determined. The change in AAMRs was examined through annual percent Change (APC) and the average annual percent change (AAPC) using Joinpoint regression. Patients aged 45-85+ years were identified using ICD-10 codes for Multiple Myeloma (C90.0) as the underlying cause of death (UCD) and renal failure (N17-N19) as a contributing cause of death (MCD).

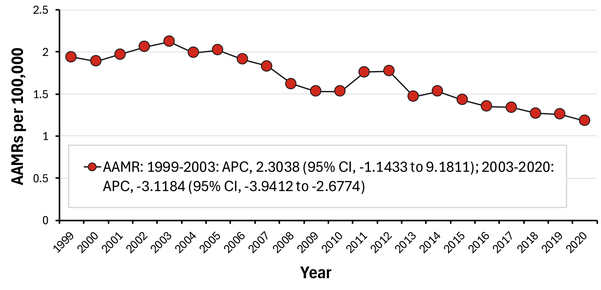
Discussion

The significant decline in renal failure-related mortality among multiple myeloma patients from 1999 to 2020 reflects advancements in novel therapies and supportive care, particularly the adoption of treatments reducing dialysis dependence and improving survival. A study observing 1,773 newly diagnosed MM patients identified that the proportion of dialysis-dependent cases dropped to 3.5% after 2005, compared to 5.5%–6% in the earlier cohorts.[1] Despite overall progress, males consistently experienced higher mortality than females, likely due to greater comorbidities and early mortality risk.[2] Non-Hispanic Blacks had the highest mortality burden but showed the steepest decline, suggesting improved access to novel therapies over time.[3] Geographic disparities persisted, with the Midwest and nonmetropolitan areas exhibiting elevated rates, potentially linked to higher comorbidity prevalence (e.g., hypertension, diabetes) and healthcare access barriers.[4] These findings underscore the need for targeted interventions addressing structural inequities and region-specific comorbidities to mitigate disparities further.

Results

A total of 42,093 deaths occurred due to renal failure in MM patients in the United States from 1999 to 2020. The proportion of multiple myeloma deaths contributed by renal failure in the US decreased from 18.12% in 1999 to 13.92% in 2020. Overall, AAMR declined from 1.94 in 1999 to 1.18 in 2020 (AAPC: -2.10). Men had a much higher mortality burden (AAMR: 2.16) than women (AAMR: 1.26). NH Blacks had the highest overall AAMR (3.61), followed by NH Whites (1.47), Hispanics (1.38), and NH Asians (0.82). However, NH Blacks did exhibit the greatest decrease in mortality over the study period, which means that they have benefited the most from improvements in treatment, access, or supportive care over the study period. AAMR also varied substantially by region (Midwest: 1.66; South: 1.65; West: 1.58; Northeast: 1.54). Nonmetropolitan areas had a higher AAMR (1.69) than metropolitan areas (1.61). The states in the top percentiles were the District of Columbia, Maryland, and South Carolina.

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Conclusion

The overall AAMR for renal failure-associated MM mortality decreased from 1999 to 2020. We observed the highest AAMR in males, NH Blacks, the Midwest, and nonmetropolitan areas of the US. Although NH Blacks had the highest total AAMR, they exhibited the greatest decrease in mortality over the study period.

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The authors declare no conflict of interest

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