Trends in Leukemia-Related Mortality with Concurrent Mycoses: A CDC WONDER Analysis (1999–2020)

Mohamed Fawzi Hemida MBBS[1], Alyaa Ahmed Ibrahim MBBS[1], Reem Mohamed MBBS[1], Krish Patel MBBS[2], Zahin Shahriar MBBS[3], Amr Ossama Arafa MBBS[1]

1. Alexandria Faculty of Medicine, Alexandria, Egypt.
2. C. U. Shah Medical College, Surendranagar, Gujarat, India.
3. Medicine Department, Dhaka Medical College Hospital, Dhaka, Bangladesh

Presented by:
Abdelrahman Mohamed, MBBCh

Context

The outcomes of patients with leukemia are strongly affected by fungal infections. However, trends in population-level mortality have not been well explored. Gaining insights into the timing of events can guide treatment decisions and support the appropriate use of resources.

Objectives

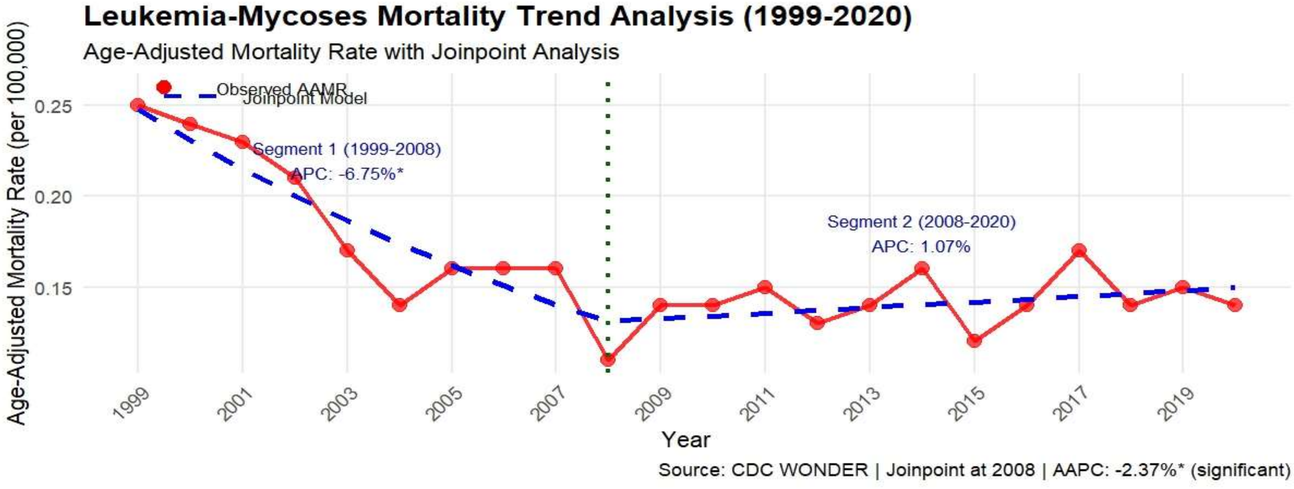
To analyze the temporal trends in leukemia-related mortality with concurrent mycoses across demographic subgroups in the US.

Methods

Retrospective analysis of multiple cause-of-death data from the CDC WONDER database (1999–2020) with Joinpoint regression analysis to identify significant changes in mortality trends. US population stratified by sex, age, race, ethnicity, geographic region, and urbanization status. All recorded deaths during 1999–2020 with both leukemia and mycoses are listed as causes of death. Age-adjusted mortality rate (AAMR) per 100,000 population, annual percent change (APC), and average annual percent change (AAPC) with 95% confidence intervals (CIs).

Results

During the study period, 7,214 deaths occurred with concurrent leukemia and mycoses. Overall, AAMR decreased significantly by 2.37% annually (AAPC: -2.37%; 95% CI, -3.63% to -1.10%; P=0.000275), with distinct temporal patterns: significant decline during 1999–2008 (APC: -6.79%; P<0.000002), followed by a nonsignificant increase during 2008–2020 (APC 1.08%; P=0.24). Sex-stratified analysis revealed a steeper initial decline in females (2002 Joinpoint; APC -14.08%) than in males (APC -2.18%). Regional differences emerged with the Northeast region showing a reversal from decline to increase (2008 Joinpoint), whereas metropolitan areas showed significant early improvement (1999–2005; APC -7.42%) followed by a plateau. Age-stratified analysis showed a stronger improvement in individuals aged 45–64 years (AAPC -4.11%) versus individuals >65 years (AAPC -1.74%). Race analysis revealed significant initial improvements across all groups, with the Hispanic population uniquely showing a recent significant increase (2010–2020; APC 5.18%).



Conclusion

For two decades, the death rate from leukemia with mycosis infection greatly decreased, although this trend of improvement ended in 2008. A reason could be demographic or regional differences that suggest patients were not provided the same level of care or testing. The mortality rate in Hispanic individuals is increasing, therefore potential explanations (eg, economic, medical, biological) should be thoroughly explored.

Keywords

ALL, leukemia, mycoses, mortality, epidemiology, CDC WONDER trends, CDC WONDER

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