Anemia Is an Important Predictor of Decline and Death in Community-Dwelling Elders

Denny SD, Kuchibhatla MN, Cohen HJ. Impact of anemia on mortality, cognition, and function in community-dwelling elderly. Am J Med 2006;119:327–34.

Study Overview

Objective. To determine the impact of anemia on mortality, functional status, and cognition in community-dwelling elders.

Design. Prospective cohort study.

Setting and participants. 1744 men and women ≥ 71 years living in Durham and surrounding counties in North Carolina were enrolled in a component of the National Institute on Aging study. African Americans comprised 54% of the cohort. Hemoglobin levels were assessed at baseline (1992). Anemia was defined by the World Health Organization criteria (ie, hemoglobin concentration of < 12 g/dL for women and < 13 g/dL for men). Functional status and cognition were assessed at baseline and at 4-year follow-up (1996).

Main outcome measures. Mortality, functional status, and cognitive function. Functional status was measured using the Katz activities of daily living (ADL) and instru mental ADL (IADL) scales, and cognition was measured using the Short Portable Mental Status Questionnaire. A search of the National Death Index verified all deaths among cohort subjects through 2000.

Main results. 24% of the study population had anemia. Those with anemia had substantially higher 8-year mortality rate compared with those without anemia (odds ratio, 1.7 [95% confidence interval, 1.5–2.0]; $P = 0.001$). Anemia was also associated with poorer physical function and cognitive function over a 4-year period. Patients with anemia had greater increases in their Katz ADL scores (0.79 versus 0.57; $P = 0.02$) and Short Portable Mental Status Questionnaire scores (1.40 versus 1.04; $P = 0.01$) than patients without anemia. The change in IADL score was smaller and not statistically significant. After adjusting for age, education, estimated glomerular filtration rate, and comorbidity, anemia was more common in African Americans (odds ratio, 3.0 [95% confidence interval, 2.3–3.9]), but this did not result in a substantial difference in mortality or functional or cognitive decline as compared with whites.

Conclusion. Anemia is associated with substantial declines in function and cognition as well as with higher mortality rates in community-dwelling elders.

Commentary

Anemia is common among elderly Americans, but most clinicians do not consider this an important marker of significant morbidity and mortality. This is partly due to the fact that estimates of anemia prevalence among the elderly vary widely [1,2] and that anemia is due to a variety of causes, from nutritional deficiency to chronic diseases. Whether anemia is a useful predictor of important clinical outcomes is still not fully understood.

Cohort studies are the ideal design for examining the importance of risk factors for adverse outcomes. Because the patients are followed over time, cohort study allows for insights about the development of a condition or complication. In this study, Denny and colleagues examined survival curves for community-dwelling elders with anemia and those without anemia and found that those with anemia had lower survival just 1 year after their diagnosis, and differences in survival continued to widen over time. Although the authors' statistical analysis focused on mortality at 8 years, their data show that anemia was associated with higher short-term mortality as well. Similarly, they found greater declines in cognitive and functional activity levels among those with anemia compared with those without anemia. However, an important caveat is that anemic patients had lower physical and cognitive function at baseline compared with nonanemic patients.

A major limitation of this study is that it fails to offer insight on whether anemia is a marker of underlying disease or a cause of functional decline and death. Although the investigators had substantial information about patients' health status, they only superficially examined whether underlying illness was an important confounder in the relationship between anemia and morbidity or mortality. Although they adjusted for a summary "health index" in their mortality analyses, they did not account for baseline differences when they examined physical and cognitive decline. This choice is troubling, given that patients with anemia

seemed to have more comorbidities and greater disability at baseline. Finally, the authors did not examine the impact of anemia treatment. Although it is likely that many patients in the study were treated by their physicians, information regarding treatment was not made available.

Applications for Clinical Practice

Anemia is extremely common in the elderly, and this study offers important insights about the association between anemia and physical and mental well-being. Whether anemia is simply a marker of other underlying disease or has important clinical implications of its own remains unclear.

—Review by Ashish K. Jha, MD, MPH

References

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