A hemoglobin level 140 g/L was associated with a lower mortality risk than levels ≤ 120 g/L in older women with disabilities

Chaves PH, Xue QL, Guralnik JM, et al. **What constitutes normal hemoglobin concentration in community-dwelling disabled older women?** J Am Geriatr Soc. 2004; 52:1811-6.

QUESTION

Are hemoglobin (Hb) levels associated with mortality risk in older, community-dwelling women with disabilities?

METHODS

Design: Cohort study (Women's Health and Aging Study [WHAS] I).
Setting: Baltimore, Maryland, USA.
Patients: 686 women ≥ 65 years of age (mean age 78 y, 72% white) who had a Mini-Mental State Examination score ≥ 18 and self-reported difficulty performing activities in ≥ 2 physical function domains.
Risk factors: Hb levels.
Outcomes: All-cause mortality after a maximum of 6 years of follow-up (median 5 y).

MAIN RESULTS

Cumulative all-cause mortality was 31%. A nonlinear relation existed between Hb and mortality, with highest mortality risk at extreme Hb levels and lowest risk in intermediate Hb levels. Mildly low Hb levels of 110 and 115 g/L were associated with greater mortality risk than an Hb level of 120 g/L, even after controlling for major chronic disease burden indicators, whereas mid-normal Hb levels of 130 g/L and 140 g/L were associated with lower mortality risk (Table). The threshold above which the decline in mortality risk with increasing Hb level was no longer statistically significant was 139 g/L.

CONCLUSIONS

In community-dwelling older women with disabilities, a hemoglobin (Hb) level of 140 g/L was associated with a lower risk for all-cause mortality than levels of 110 g/L and 120 g/L after adjustment for chronic disease burden. Mortality risk decreased with increasing Hb levels up to a threshold of 139 g/L.

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Association between hemoglobin levels and all-cause mortality in older, community-dwelling women with disabilities*

Hemoglobin (g/L)	Adjusted hazard ratio (95% CI)†
80	2.3 (1.3 to 4.0)
90	1.8 (1.2 to 2.8)
100	1.5 (1.1 to 2.0)
110	1.2 (1.1 to 1.4)
115	1.1 (1.0 to 1.2)
120	1.0 (reference group)
130	0.82 (0.71 to 0.94)
140	0.74 (0.59 to 0.92)
150	0.79 (0.55 to 1.1)
160	1.0 (0.48 to 2.1)

*CI defined in Glossary.
†Adjusted for age, race, education, smoking status, drinking habits, coronary heart disease, peripheral artery disease, congestive heart failure, stroke, diabetes mellitus, chronic obstructive or restrictive pulmonary disease, lower-extremity osteoarthritis, rheumatoid arthritis, hip fracture, cancer, calculated creatinine clearance, FEV_1, ankle–arm index, thyroid-stimulating hormone, serum albumin, total serum cholesterol, serum interleukin-6, body mass index, comorbidity index, Mini-Mental State Examination score, short Geriatric Depression Scale score, difficulty performing basic activities of daily living, and lower-extremity Short Physical Performance Battery score.

COMMENTARY

A debated clinical question is whether mild anemia is associated with any health risks, and if so, at what Hb level should we make diagnostic or therapeutic decisions? Chaves and colleagues showed that mild anemia (Hb 115 g/L) was associated with increased mortality in women with disabilities, a finding that is consistent with other studies of elderly populations (1, 2). Deriving definitions about normal values (and related thresholds for interventions) based on such data is an improvement over the traditional statistical method that uses data from "normal" persons.

It is unclear whether mild anemia is a marker for subclinical disease or simply aging. Chaves and colleagues tried to isolate the independent effect of Hb levels on mortality by adjusting for comorbid conditions. They acknowledge that the potential for residual confounding exists.

Izaks and colleagues (1) suggest that anemia is a marker for disease. In a prospective cohort study of persons ≥ 85 years of age, they found that neoplasms and infections were more frequent causes of death in persons with anemia than in those with normal Hb levels.

Is it worth the effort to search for causes of anemia in this population? Guralnik and colleagues (3) report that about one third of patients ≥ 65 years of age with anemia have nutritional deficiencies (primarily iron deficiency), one third have anemia secondary to chronic disease, and one third have unexplained anemia. These data suggest that a treatable cause of anemia can be identified for most patients.

Further studies are needed to show whether treating elderly patients with mild anemia has benefits for mortality and for other outcomes, such as functional and cognitive status. Limited testing targeted at identifying treatable causes may be an appropriate strategy. However, 10% of elderly persons have anemia (3) with low associated mortality (as shown by Chaves and colleagues). The cost-effectiveness of such a strategy needs to be assessed.

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