A haemoglobin concentration of 140 g/l was associated with a lower mortality risk than concentrations ⩽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.

Clinical impact ratings GP/FP/Primary care ★★★★★☆ Haematology ★★★☆☆☆ Geriatrics ★★★★★☆

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Q Are haemoglobin (Hb) concentrations associated with mortality risk in older, community dwelling women with disabilities?

METHODS

Design: cohort study (Women's Health and Aging Study 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 concentrations.

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 non-linear relation existed between Hb and mortality, with highest mortality risk at extreme Hb

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concentrations and lowest risk in intermediate Hb concentrations. Mildly low Hb concentrations of 110 and 115 g/l were associated with greater mortality risk than an Hb concentration of 120 g/l, even after controlling for major chronic disease burden indicators, whereas mid-normal Hb concentrations 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 concentration was no longer statistically significant was 139 g/l.

CONCLUSIONS

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

Abstract and commentary also appear in ACP Journal Club.

Association between haemoglobin concentrations and all cause mortality in older, community dwelling women with disabilities*

Haemoglobin (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 anaemia is associated with any health risks, and if so, at what Hb concentration should we make diagnostic or therapeutic decisions? Chaves *et al* showed that mild anaemia (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 anaemia is a marker for subclinical disease or simply ageing. Chaves *et al* tried to isolate the independent effect of Hb concentrations on mortality by adjusting for comorbid conditions. They acknowledge that the potential for residual confounding exists.

Izaks *et al*[1] suggest that anaemia is a marker of 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 those with anaemia than in those with normal Hb concentrations.

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

Further studies are needed to show whether treating elderly patients with mild anaemia 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 people have anaemia[3] with low associated mortality (as shown by Chaves *et al*). The cost effectiveness of such a strategy needs to be assessed.

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1 Izaks GJ, Westendorp RG, Knook DL. *JAMA* 1999;**281**:1714–7.
2 Kikuchi M, Inagaki T, Shinagawa N. *J Am Geriatr Soc* 2001;**49**:1226–8.
3 Guralnik JM, Eisenstaedt RS, Ferrucci L, *et al. Blood* 2004;**104**:2263–8.