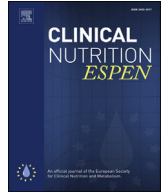




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Review

Role of nutrition on anemia in elderly



Vittorio Emanuele Bianchi

Department of Endocrinology, Hospital of Cagliari Asur1 (PU), Italy

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SUMMARY

Anemia in elderly population have a great incidence and is related to increased mortality risk. The incidence of nutrition in anemia is about one third of the total. Caloric and protein restriction, iron, vitamin B₁₂, folic deficiency are the causes of nutritional anemia. Protein and energy malnutrition stimulate an increased cytokines production with induction of inflammation, immunodeficiency and anemia. Anorexia and obesity can be associated with anemia due to increased cytokines and hepcidin serum level. Macrophages activity is inhibited and a decrease in red blood cells (RBC), hemoglobin (Hb) concentration due to ineffective erythropoiesis is observed. An adequate energy and protein diet is necessary to reduce inflammation and increase iron absorption. A minimum of 1700 kcal/day and 1.7 gr/kg/day of protein intake are necessary to maintain anabolism in chronic patients to prevent and treat anemia. Iron supplementation by intravenous injection is safe and effective to correct severe iron deficiency. The supplementation of vitamins and oligomineral are useful to reduce oxidative stress and improve RBC longevity. Anemia in elderly could be prevented by an adequate nutrition, a simple and not expensive intervention, and associated to physical exercise reduce the incidence of mortality rate.

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Contents

1. Introduction	e2
2. Definition of anemia	e2
3. Types of anemia	e2
4. Prevalence in nursing homes	e2
5. Malnutrition-related anemia	e3
6. Iron deficiency	e3
7. Hepcidin	e3
8. Nutrition and GH/IGF1	e3
9. Malnutrition, inflammation, immunity	e3
10. Mechanism of induction of anemia in malnutrition	e4
11. Anorexia and anemia	e4
12. Anemia in obese subjects	e4
13. Treatment	e5
13.1. Nutritional screening	e5
13.2. Protein intake	e5
13.3. Energy intake	e5
13.4. Fat intake	e6
13.5. Iron replacement	e6
13.6. Vitamin B ₁₂	e6
13.7. Folic acid	e6
13.8. Vitamin E	e6
13.9. Vitamin C	e6

E-mail address: dott.vbianchi@gmail.com.

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13.10. Vitamin De7
 13.11. Magnesiume7
 13.12. Seleniume7
 14. Diet and exercise in chronic anemia e7
 15. Weight loss program e7
 16. Conclusions e7
 Referencese7

1. Introduction

Anemia is a risk factor in older population associated with a great variety of adverse outcome including hospitalization, disability and mortality [1–5]. The reduction of Hb level is related to future increased morbidity and mortality [6]. Subjects older than 85 years with anemia had a 5-years mortality higher than subjects with normal Hb levels [7]. Among individuals mean age 72.5, mild anemia (Hb levels > or = 10 g/dl) was found in 6.1% of women and 8.1% of men and a greater mortality risk, near doubling of the 5-year, was found in anemic men but not in women [8]. An increase in mortality has been found associated with Hb level less than 11gr/dL [4] (See Fig. 1). An higher mortality rate in person of 65 years and older hospitalized for myocardial infarction [9], in systolic and diastolic in chronic heart failure (CHF) [10] and in older

CHF patients [11] was found in anemia. Anemia is also an independent risk factor for decline in physical performance [12] and have a negative impact on quality of life, physical functioning, and reduced muscular strength in older [13,14].

2. Definition of anemia

The World Health Organization (WHO) definition of anemia limits were <13 g Hb/dL for men and <12 g Hb/dL for women [15]. Recently a new lower limits of normal for Hb concentration in old age have been suggested using the proposed cut-off of Hb concentration (lower than 12.2 g/dL in women and 13.2 g/dL in men) [16]. By the classification systems mild grade anemia was defined as a Hb concentration between 10.0 and 11.9 g/dL in women and between 10.0 and 12.9 g/dL in men [17,18].

Iron deficiency anemia (IDA) was considered present if the elderly had low serum iron (lower than 50 µg/dL in women and 60 µg/dL in men), low ferritin (lower than 15 ng/mL), low transferrin saturation rate (lower than 16%) or increased total iron binding capacity (higher than 450 µg/dL).

The proportion within this category with macrocytosis (mean corpuscular volume greater than 100 dL), leucopenia (white blood cell count less than 3000/dL), or thrombocytopenia (platelet count less than 150.000/mm³), represent hematologic features consistent with the diagnosis of myelodysplastic syndrome [19].

3. Types of anemia

In the approximately 3 million older anemic persons after age 50 years, the incidence rate of anemia increased rapidly, to a rate greater than 20% at age 85 and older. Overall, 11.0% of men and 10.2% of women 65 years and older are anemic. Two third of participants with anemia had two or more age associated diseases [20]. Anemia in older persons is divided in four major types according to causes: 1) nutrient deficiencies were present in one third, 2) chronic kidney disease, 3) chronic disease or inflammation (ACI) or chronic renal disease or both was present in one third and 4) unexplained anemia (UA) was present in one third.

IDA has been considered from a long time the most common form of anemia worldwide, but as seen in the Table 1, deficiencies of iron, folate, or B₁₂ account for one third of all anemia in the elderly (34% of the total with the incidence of iron only of 16%).

4. Prevalence in nursing homes

The malnutrition risk in institutionalized elderly is usually very high and the incidence and complication due to anemia in elderly are increased. Artz et al. [22] reported that 48% of home residents had anemia. Robinson et al. [23] found an incidence of 60% and 43% had chronic kidney disease. Landi and al [24] reported an incidence of anemia in 63% in older residents and the risk of death, adjusting for age and sex, in the 2-year was 60% higher in anemic than in non-

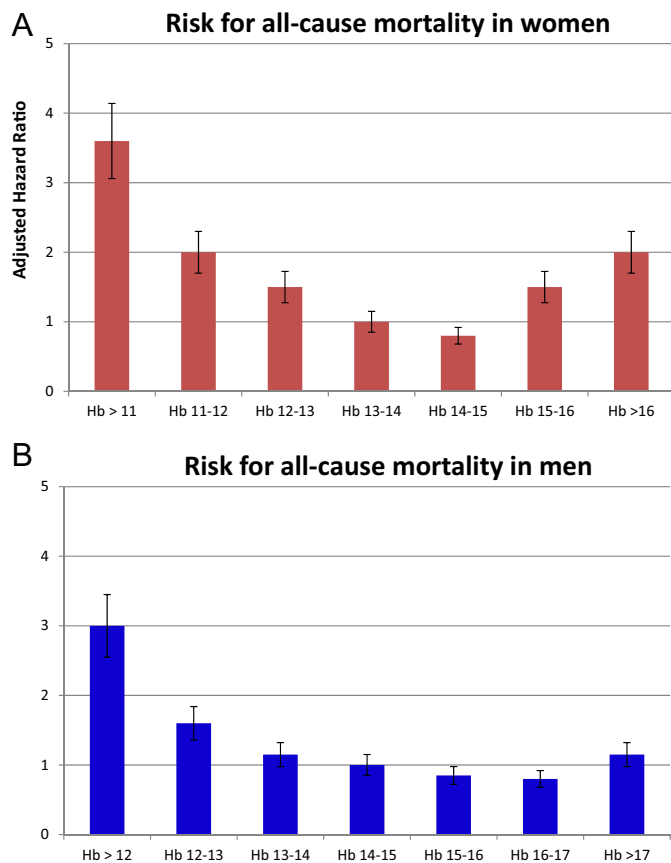


Fig. 1. Association between hemoglobin and risk for all-cause mortality. A=women; B=men. The bars indicate the estimated risk and the 95% confidence interval estimated. The data show that the minimum risk for all-cause mortality is found at the Hb level between 14-15 mg% for women and 16-17 mg% for men. Reproduced with permission from Culleton [1].

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