

Anaemia

There is a high prevalence of anaemia in the elderly population. Anaemia signifies an underlying disease and is associated with increased morbidity and mortality. It can be underdiagnosed in this age group as the symptoms of anaemia can be attributed to the ageing process. This two part review discusses the most common causes of anaemia that geriatricians are likely to encounter in clinical practice.

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Anaemia is an extremely common problem in the elderly and is associated with increased morbidity and mortality. A recent review article found that one in seven to eight of the population over 65 years are anaemic, as defined by the World Health Organization (WHO) criteria.¹ The overall prevalence in the UK is 20.1% in elderly men and 13.7% in elderly women.²

The WHO definition of anaemia is a haemoglobin (Hb) concentration <13g/dL in men and <12g/dL in women. There has been debate about the use of these values, particularly in reference to the elderly population because there is a progressive and apparently physiological decrement of marrow haematopoiesis in this population.³ But, studies have shown that in older patients with haemoglobin levels less than 12g/dL an underlying cause can be found,⁴ and, at present there is no widely accepted alternative definition in this age group.⁵

Common causes

Chronic disease is the most common cause of anaemia in elderly patients (“anaemia of chronic disease”).⁶ Many diseases are associated with this type of anaemia, but often an underlying cause is not found (see box 1).

With anaemia of chronic disease, there is an impaired ability to use iron stored in the reticuloendothelial system, relatively reduced levels of erythropoietin, and a mild decrease in the lifespan of red blood cells to 70–80 days (normally 120 days).⁷ Anaemia

is a common complication of chronic kidney disease, mainly due to the inability of the kidneys to secrete enough erythropoietin for adequate haematopoiesis. The anaemia in diabetes mellitus is also contributed to by diabetic nephropathy, leading to impaired erythropoietin production and secretion.

Nutritional deficiencies are also common in the elderly, accounting for up to one third of cases of anaemia.⁸ Iron-deficiency anaemia, the second most common cause of anaemia in the elderly, usually results from chronic gastrointestinal blood loss caused by gastritis,

Key points

- Chronic disease is the most common cause of anaemia in elderly patients
- Nutritional deficiencies are also common in the elderly, accounting for up to one third of cases of anaemia.
- The impact of anaemia has been found to be greatest in elderly patients.
- It is also important to consider myeloma in elderly patients with anaemia.

Box 1: Common causes**Chronic inflammation**

- Rheumatoid arthritis
- Non-infective enteritis and colitis
- Systemic lupus erythematosus (SLE)
- Vasculitis
- Sarcoidosis

Chronic infections

- Infective endocarditis
- Osteomyelitis
- Lung abscess

Malignancy

- Chronic kidney disease

peptic ulcer, colonic malignancy, diverticula, inflammatory bowel disease, or angiodysplasia. Older people can become iron deficient because of inadequate intake or absorption of iron, and anaemia develops over several years in these cases.

It is predicted that 12% of the elderly population will have low B12 levels.⁹ The actual prevalence of B12 deficiency is likely to be higher than predicted because the symptoms are not reliably present in the elderly. The neurological symptoms (eg, mild depression) can develop before the patient becomes anaemic. B12 deficiency is rarely due to inadequate intake, and is usually due to inadequate absorption of B12 due to pernicious anaemia, bacterial overgrowth, inflammatory bowel disease and following partial gastrectomy. In contrast, folate deficiency is much more commonly due to dietary insufficiency.

Coeliac disease is another

important cause of anaemia in the elderly and is becoming increasingly common in the elderly population. Studies have shown up to 34% of newly diagnosed cases of coeliacs are in the over 65 age group.¹⁰ The presentation can be very subtle and lead to a significant delay in diagnosis. A retrospective multicentre Italian study found a mean delay in diagnosis in the elderly population of 17 years.¹¹ Symptoms include weight loss, fatigue, abdominal bloating, and chronic diarrhoea. If the disease is undiagnosed for a long time, patients can develop signs of vitamin deficiencies including neurological complications, osteoporosis and malnutrition. Elderly coeliacs have an increased risk of other autoimmune disorders (especially thyroiditis), osteopenia and osteoporosis, and malignant intestinal disease, particularly lymphoma.¹²

There are a variety of haematological conditions that have anaemia as a manifestation. Elderly patients with acute leukaemia tend to have a more slowly progressing disease course than younger patients. Presentation is with low, high, or even normal white blood cell count. Chronic lymphocytic leukaemia (CLL) is common in elderly persons. Patients commonly have an elevated lymphocyte count at presentation, but some will present with autoimmune haemolytic anaemia and a relatively normal lymphocyte count. Multiple myeloma should always be considered, particularly in patients with elevated globulin levels.

Box 2: Causes of anaemia in the elderly in order of frequency¹⁸

- Unexplained
- Anaemia of chronic disease
- Iron deficiency
- Vitamin B12 or folate deficiency
- Chronic kidney disease
- Myelodysplastic syndromes
- Endocrinopathies.

The early morphological changes of myelodysplastic syndromes (MDS) can be very subtle and difficult to diagnose, and many cases of unexplained anaemia in the elderly population may actually be indolent forms of the condition. MDS is a primary disorder of haematopoiesis, characterised by underproduction of one or more blood cell lineages. It is increasingly common with increasing age, with a median onset in the seventh decade of life.¹³ MDS is slightly more common in males than in females. The exception to this rule is the “5q- syndrome”, which is a specific type of MDS affecting predominantly females, with particular characteristics, including severe anaemia, frequent thrombocytosis, typical dysmegakaryopoiesis and favorable outcome.¹⁴ Anaemia can also be a sign of bone marrow infiltration from lymphoma or other malignancy.

Also a common cause of anaemia, hypothyroidism reduces red cell mass and may lead to a macrocytic anaemia. Occasionally,

hypothyroidism may lead to a macrocytosis without anaemia. Hypothyroidism and hyperthyroidism may be associated with pernicious anaemia.¹⁵ The incidence of hypothyroidism increases with advancing age and is more common in females.¹⁶

Other causes

Many medications have the capacity to reduce erythropoiesis, hence polypharmacy in the elderly contributes to anaemia. Alcohol is also an important cause of anaemia, through bone marrow suppression, iron or folate deficiency and gastrointestinal blood loss. It has also been hypothesised that the impact of reduced testosterone and oestrogen levels amongst the elderly population may contribute to anaemia.¹⁷

Many cases of anaemia in the elderly remain unexplained, and the causes are likely to be multifactorial.

Consequences

The impact of anaemia has been found to be greatest in elderly patients.¹⁹ Anaemia has been associated with increased frailty, reduced exercise tolerance, reduced cognitive function, increased dementia risk, increased falls risk, lower bone density, restless leg syndrome and increased incidence of depression. Furthermore, higher rates of delirium have been reported amongst hospitalised patients with anaemia.²⁰ It is clear that anaemia has a significant health impact on the elderly population, highlighting the importance of treating the underlying cause wherever possible.

Conclusion

It is important that geriatricians recognise the impact of anaemia on the elderly population. Further investigation of anaemic patients is important to establish the underlying aetiology and enable treatment of the underlying cause wherever possible.

The second part of this article will be published in the next edition and will discuss diagnosis and treatment.

Conflict of interest: none declared

References

1. H Gaskell, Derry S, Moore A, et al. Prevalence of anaemia in older persons: systematic review; *BMC Geriatrics* 2008; **8**:1
2. Challand GS, Michailoudis A, Watfa R. Distribution of haemoglobin in patients presenting to their general practitioner and its correlation with serum ferritin. *Ann Clin Biochem* 1990; **27**: 15–20
3. Beutler E, Waalen J. The definition of anaemia: what is the lower limit of normal of the blood haemoglobin concentration? *Blood* 2006; **108**: 802–3
4. Joosten E, Pelemans W, Hiele M, et al. Prevalence and causes of anaemia in a geriatric hospitalized population. *Gerontology* 1992; **38**: 11–17
5. Nilsson-Elhe H, Jagenburg R, Landahl S, Svanborg A: Blood haemoglobin declines in the elderly: implications for reference intervals age 70–88. *Eur J Haematol* 2000, **65**: 297–305
6. Kirkeby OJ, Fossum S, Riscoe C. Anaemia in Elderly patients. Incidence and causes of low haemoglobin in patients presenting to a city general

7. Besarab A, Levin A. Defining a renal anaemia management period. *Am J Kidney disease* 2000; **36** (6 suppl 3): S13–23
8. Geralnik JM, Eisenstaedt RS, Ferrucci L, et al. Prevalence of anaemia in persons age 65 years and older in the united states: evidence for a high rate of unexplained anaemia. *Blood* 2004; **104**: 2263–2268
9. Andreas E, Loukili N, Noel E, et al. Vitamin B12 (cobalamin) deficiency in elderly patients. *CMAJ* 2004; **171**: 251–59
10. Johnson MW, Ellis HJ, Asante MA, Ciclitira PJ. Coeliac disease in the elderly. *Nat clin prat gastroenterology hepatoology* 2008; **5**(12): 697–706
11. G Gasberinni, R Cicciciopotti, I De Vitis, G R Corazzi. Coeliac disease in the elderly. *Gerontology* 2001; **47**; 306–10
12. Freeman H. Adult Coeliac Disease in the Elderly. *World J Gastroenterology* 2008; **14**: 6911–14
13. Ma X, Does M, Raza A, Mayne ST. Myelodysplastic Syndromes: incidence and survival in the united states. *Cancer* 2007; **109**:1536–42
14. Fenaux P, Kelaidi C. Treatment of the 5-q-syndrome. *Haematology* 2006; (1): 192–198
15. Green ST, Ng JP. *Hypothyroidism and Anaemia. Biomed Pharmacother* 1986; **40**(9): 326–31
16. Sawin CT, Castelli WP, Hershman JM, et al. The aging thyroid. Thyroid deficiency in the Framingham Study. *Arch Intern Med* 1985; **145**(8): 1386–88
17. Ferrucci L, Maggio M, Bandinelli F, et al. Low testosterone levels and the risk of anaemia in older men and women. *Arch Intern Med* 2006; **166**: 1380–1388
18. Artz A, Ershler W. Anaemia in Elderly Persons. *EMedicine Specialties*. Sept 2009
19. Izaks G, Westendorp R, Knook D. The definition of anaemia in older persons. *JAMA* 1999. **281**(18): 1714
20. Casale G, Bonora C, Migliavacca A et al. Serum ferritin and aging. *Age Aging* 1981; **10**: 119–22