Anemia in the aged is not ageing related: position paper on anemia in the aged by the "working group anemia" of the German Geriatric Society (DGG)

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SPECIAL ARTICLE

Anemia in the aged is not ageing related: position paper on anemia in the aged by the "working group anemia" of the German Geriatric Society (DGG)

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Abstract
Anemia in the aged is a frequent but still under-estimated problem in geriatric patients. However, in recent years increasing research on anemia in the aged has improved awareness and interest in this clinically relevant problem. Guidelines for diagnostic and therapeutic steps are now required to improve the treatment of anemic aged patients. For encouraging the development of diagnostic and therapeutic recommendations, the "working group anemia" of the German Geriatric Society (DGG) has issued a position paper on anemia in the aged, based on the current literature. The statements are (1) that anemia has to be considered a highly prevalent but not a physiologic finding in aged persons; (2) that reference values for hemoglobin concentration are independent of age, indicating that WHO reference values for anemia definition are valid for aged persons; (3) that anemia in the aged is associated with functional and cognitive impairment based on comprehensive geriatric assessment (CGA), requiring diagnosis and treatment.

Keywords Anemia · Geriatrics · Position paper

Introduction

Anemia in the aged is a frequent but still under-estimated problem in geriatric patients. However, in recent years increasing research on anemia in the aged has improved awareness and interest in this clinically relevant problem. Guidelines for diagnostic and therapeutic steps are now required to improve the treatment of anemic aged patients. For encouraging the development of diagnostic and therapeutic recommendations, the "working group anemia" of the German Geriatric Society (DGG) has prepared a position paper referring to the three consensus statements:

1. Anemia in the aged is a highly prevalent but not a physiologic finding,
2. Reference values for hemoglobin are independent of age,
3. Anemia in the aged is associated with functional and cognitive impairment based on the comprehensive geriatric assessment (CGA) why patients should be checked and treated for anemia.

The consensus group consisted of three geriatricians with expertise in gastroenterology (AL), internal medicine (GK) and hemato-oncology (GR) as well as an expert in hematopathology (IG). The consensus was developed based on the current literature and interdisciplinary research carried out by members of the working group. Revision of literature was carried out by working group members between March 2017 and September 2017, followed by discussion and consensus development between October and December 2017. The final statements were drafted by January 2018 and included in the text after critical revision of every working group member.

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Statements of the working group

Statement 1: anemia in the aged is a highly prevalent but not a physiologic finding

Several international studies have shown that the prevalence of anemia is high and varies depending on the population considered: among geriatric in-patients anemia is more prevalent than among home-dwelling seniors [6, 7]. Cytologic analysis revealed mostly normocytic and mild anemia [2, 7, 13]. International data on anemia in the aged can now be compared with German data: results of our own monocenter studies [14, 22] are confirmed by the first German multicenter study on anemia prevalence among geriatric in-patients with a prevalence of > 50% [13]. These findings are in accordance with previous international findings on anemia prevalence [2, 6, 7]. There is general agreement that anemia is not a physiologic characteristic of aging people, but rather assumed to be multicausal [7]. Various causes have been summed up in the three main categories of anemia with nutrient deficiency, anemia without nutrient deficiency and (still) unexplained anemia [7]. Reasons for the development of this latter mentioned category of anemia are still unknown. Considerations vary from early form of myelodysplastic syndrome [2] to hormonal dysregulation [16], but further research is required. Analysis of long-term follow-up of patients with unexplained anemia might offer new aspects, if this category of anemia remains unexplained.

Based on the available data, the experts of the working group anemia agree that anemia is a frequent but not a physiologic finding in older people.

Statement 2: reference values for hemoglobin concentration are independent of age

In most of the epidemiologic studies on anemia in the aged WHO criteria are applied to define anemia with women being anemic if Hb < 12 g/dl and men being anemic if Hb < 13 g/dl [19]. However, validity of these reference values for older patients has been controversial for a long time [3, 5, 20]. They have been developed > 40 years ago by a WHO expert group based on the modification of arbitrarily chosen values to compete the problem of incoherent international study results [19]. For many years, there was an ongoing quest for what can be considered a normal hemoglobin reference value in older patients. Results of our study on hematologic parameters carried out on behalf of the German Society of Hematology and Oncology (DGHO) and the German Geriatric Society (DGG) on 30 611 seniors aged ≥ 60 years [15] are in accordance with recommended DGHO reference values [8] and confirmed the WHO reference values [19]. Although data do not allow any conclusion concerning mortality [5], the members of the working group agree that there is evidently no need for establishing age-specific red blood cell reference ranges for German subjects aged > 60 years [15].

Further research should focus on the evaluation of normal values for other anemia related serum parameters like ferritin. Currently, data of a subsequent interdisciplinary study are being evaluated in cooperation between the DGG and the DGHO.

Statement 3: anemia in the aged is associated with functional and cognitive impairment based on comprehensive geriatric assessment (CGA) why patients should be checked and treated for anemia

The CGA is one of the main columns in geriatric practice. Based on CGA results, diagnostic and therapeutic approaches in every individual geriatric patient are planned. Several studies have evaluated the impact of anemia on functional impairment based on Barthel Index (BI) or activity of daily living (ADL). Results of our study on multidimensional loss of function (MLF) among anemic and non-anemic geriatric inpatients revealed that hospitalized patients with anemia had 4.3-fold greater odds for MLF than their non-anemic counterparts [22]. We could even show that for each drop of Hb concentration by one unit there were 1.5-fold higher odds of MLF (CI 1.19–1.92; $p = 0.001$) [22]. Our data confirmed previous findings by Romero-Ruperto [17] and the Octabaix study group [4]. Analysis of functional impairment among patients of the German anemia prevalence study "GeriPraevalenz2013" showed comparable results among German geriatric inpatients: anemic patients had significantly more often functional impairment and significantly lower BI values than non-anemic controls [12].

There is also growing evidence that anemia seems to have an impact on cognitive function. Several studies on different study populations revealed an association between anemia and cognitive decline based on established assessment tests [1]. Results of the Health ABC study revealed an increased risk (RR1.64) of developing dementia based on Mini Mental State Test for anemic patients [9]. These findings confirm previous results of the GIFA study, showing a significant association between anemia and cognitive impairment and an increased chance for cognitive decline by OR 1.32 in anemic older patients [21].

Data respecting the impact of anemia on patient's emotional status are still rare, but an association is suspected: Umegaki et al. could show an association between reduced hemoglobin levels associated with depression in women ($p = 0.046$), but not in men [18].

Although there is still a lack of guidelines for diagnostic and therapeutic steps for anemia in older patients [11], the working group agrees that the negative impact of anemia on patients' CGA results requires a check for and treatment of anemia in geriatric patients [10].

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

Informend consent For this type of study formal consent is not required.

References

1. Andro M, Le Squere P, Estivin S, Gentric A (2013) Anaemia and cognitive performances in the elderly: a systematic review. Eur J Neurol 20(9):1234–1240. https://doi.org/10.1111/ene.12175
2. Bach V, Schruckmayer G, Sam I, Kemmler G, Stauder R (2014) Prevalence and possible causes of anemia in the elderly: a cross-sectional analysis of a large European university hospital cohort. Clin Interv Aging 22(9):1187–1196. https://doi.org/10.2147/CIA.S61125
3. Beutler E, Waalen J (2006) The definition of anemia: what is the lower limit of normal of the blood hemoglobin concentration? Blood 107(5):1747–1750
4. Contreras M, Formiga F, Ferrer A, Chivite D, Padrós G, Montero A, Grupo Octabaix (2015) Profile and prognosis of patients over 85 years old with anemia living in the community. Octabaix Study. Rev Esp Geriatr Gerontol 50(5):211–215. https://doi.org/10.1016/j.regg.2014.11.004
5. Culleton BF, Manns BJ, Zhang J, Tonelli M, Klarenbach S, Hemmelgarn BR (2006) Impact of anemia on hospitalization and mortality in older adults. Blood 107(10):3841–3846
6. Gaskell H, Derry S, Andrew Moore R, McQuay HJ (2008) Prevalence of anaemia in older persons: systematic review. BMC Geriatr 14(8):1. https://doi.org/10.1186/1471-2318-8-1
7. Guralnik JM, Eisenstaedt RS, Ferrucci L, Klein HG, Woodman RC (2004) Prevalence of anemia in persons 65 years and older in the United States: evidence for a high rate of unexplained anemia. Blood 104(8):2263–2268
8. Hastka J, Heimpel H, Metzgeroth G (2011) Iron deficiency and iron deficiency anemia (Eisenmangel und Eisenmangelanämie) Onkopedia guideline: https://www.onkopedia.com/de/onkopedia/guidelines/eisenmangel-und-eisenmangelanaemie. Accessed 20 Jan 2018
9. Hong CH, Falvey C, Harris TB, Simonsick EM, Satterfield S, Ferrucci L, Metti AL, Patel KV, Yaffe K (2013) Anemia and risk of dementia in older adults: findings from the Health ABC study. Neurology 81(6):528–533
10. Leischker A, Fetcher S, Kolb GF (2016) Anaemia in the elderly. Dtsch Med Wochenschr 141(13):954–959
11. Röhrig G, Schulz RJ (2012) Anemia in the elderly. Urgent need for guidelines. Z Gerontol Geriatr 45(3):182–185
12. Röhrig G, Becker I, Schulz RJ, Lenzen-Großimlinghaus R, Willschrei P, Gebauer S, Modreker M, Jäger M, Wirth R (2016) Association between hematologic parameters and functional impairment among geriatric inpatients: data of a prospective cross-sectional multicenter study ("GeriPrävalenz2013"). Maturitas 90:37–41. https://doi.org/10.1016/j.maturitas.2016.04.020
13. Röhrig G, Hörter M, Becker I, Adams A, Gebauer S, Jäger M, Lenzen-Grossimlinghaus R, Modreker MK, Schulz RJ, Willschrei HP, Wirth R (2016) Anemia and hematologic parameters in older patients: results of a German multicentric cross-sectional study. Eur Geriat Med 7(4):328–332
14. Röhrig G, Klossok W, Becker I, Benzing T, Schulz RJ (2014) Prevalence of anemia among elderly patients in an emergency room setting. Eur Geriatr Med 5(1):3–7
15. Röhrig G, Becker I, Gutensohn K, Nebe T. Red blood cell counts and indices in the elderly German population. Accepted by Journal of Laboratory Medicine No. JLM.2017.0080.R2 on 4.11.2017
16. Saad F, Röhrig G, von Haehling S, Traish A (2017) Testosterone deficiency and testosterone treatment in older men. Gerontology 63(2):144–156
17. Romero-Ruperto S, Pérez-Bocanegra MC, Duran-Taberna M, Toscano-Rivera A, Barbé-Gil Ortega J, San José-Laporte A (2015) Anemia in elderly patients admitted to an acute geriatric ward. Rev Esp Geriatr Gerontol. 50(3):122–125. https://doi.org/10.1016/j.regg.2014.09.002
18. Umegaki H, Yanagawa M, Endo H (2011) Association of lower hemoglobin level with depressive mood in elderly women at high risk of requiring care. Geriatr Gerontol Int. 11(3):262–266. https://doi.org/10.1111/j.1447-0594.2010.00672x
19. World Health Organization (1968) Nutritional anaemias. Report of a WHO scientific group. World Health Organ Tech Rep Ser 405:5–37
20. Zakai NA, Katz R, Hirsch C, Shlipak MG, Chaves PH, Newman AB, Cushman M (2005) A prospective study of anemia status, hemoglobin concentration, and mortality in an elderly cohort: the Cardiovascular Health Study. Arch Intern Med 165(19):2214–2220
21. Zamboni V, Cesari M, Zuccalà G, Onder G, Woodman RC, Maraldi C, Ranzini M, Volpato S, Pahor M, Bernabei R (2006) Anemia and cognitive performance in hospitalized older patients: results from the GIFA study. Int J Geriatr Psychiatry 21(6):529–534
22. Zilinski J, Zillmann R, Becker I, Benzing T, Schulz RJ, Roehrig G (2014) Prevalence of anemia among elderly inpatients and its association with multidimensional loss of function. Ann Hematol 93(10):1645–1654. https://doi.org/10.1007/s00277-014-2110-4