THE PLANET

Original Article

Anaemia and Its Associated Factors among Geriatric Patients in a Tertiary Care Hospital

Subir Chandra Das[1*], Polash Chandra Dey[2], Halima Akther[3], Durga Devee Sarker[4], AFM Nazmul Islam[5]

ARTICLE INFO

Received: 12 Apr 2026
Accepted: 19 Apr 2026
Published Online: 5 May 2026

DOI: 10.5281/zenodo.20038804

Volume: 9, Number: 2, Page: 151-154

e-ISSN: 2789-5912
ISSN: 2617-0817

*Corresponding author

ABSTRACT

Introduction: Anaemia is a common and clinically significant condition in older adults, associated with increased morbidity, functional decline, and reduced quality of life. Its development in the elderly is multifactorial, influenced by chronic diseases, nutritional deficiencies, medication use, and socioeconomic factors. This study aims to assess anaemia and its associated factors among geriatric patients in a tertiary care hospital. **Methods & Materials:** This descriptive cross-sectional study was conducted in the Department of Medicine at Sylhet MAG Osmani Medical College, Sylhet, Bangladesh, from March to August 2017. A total of 384 patients were selected as study subjects. Data were analysed using SPSS version 16. **Result:** Hypertension (38%) and diabetes mellitus (24.2%) were the most common comorbidities, while chronic PUD, CKD, and chronic lung disease were also frequent. Proton pump inhibitors (40.9%) and antithrombotic medications (19.8%) were commonly used. Over one-third had a history of smoking (37.8%), whereas alcohol and drug use were rare. Anaemia affected 172 patients, with severe anaemia (<10 g/dL) more frequent in females (31.3% vs 24.6%), though age and sex were not significantly associated with anaemia. **Conclusion:** This study shows that anaemia in geriatric patients is influenced by socioeconomic vulnerability, multiple chronic illnesses, and the use of medications such as PPIs and antithrombotics. Although no significant association with age or sex was found, severe anaemia was more frequent in females.

Keywords: *Anaemia, Geriatric Patients, Comorbidities.*

1. *Assistant Professor, Department of Medicine, National Institute of Neurosciences & Hospital, Dhaka, Bangladesh (ORCID: 0000-0002-9406-0690)*
2. *Junior Consultant, Department of Medicine, Upazila Health Complex, Sylhet, Bangladesh*
3. *Medical Officer, Department of Medicine, Sylhet MAG Osmani Medical College Hospital, Sylhet, Bangladesh*
4. *Junior Consultant, Department of Radiology, Dhaka Dental College, Dhaka, Bangladesh*
5. Professor (Rtd), Department of Medicine, Sylhet MAG Osmani Medical Colleges, Sylhet, Bangladesh

INTRODUCTION

Anaemia in older adults is a major public health and clinical concern because of its association with increased morbidity, functional decline, cognitive impairment, frailty, and mortality. The World Health Organisation points out that haemoglobin thresholds used to define anaemia must be interpreted with care in the elderly, since physiological and pathological changes with ageing may affect baseline haemoglobin levels [1]. Older adults are more susceptible to anaemia due to chronic diseases, nutritional deficiencies, age-related changes in bone marrow, and inflammation that interferes with erythropoiesis [2]. Iron deficiency and anaemia of chronic disease remain the two most common types of anaemia among geriatric patients. Iron-deficiency anaemia, often caused by chronic blood loss, malabsorption, or inadequate dietary intake, remains one of the largest contributors, especially in the setting of limited socioeconomic resources [3]. Anaemia of chronic inflammation is equally highly prevalent in patients with chronic kidney disease, congestive heart failure, chronic lung disease, and cerebrovascular disorders, mediated by high levels of cytokines and alterations in hepcidin metabolism [4]. The inflammatory environment in the elderly, sometimes termed "inflammaging," contributes further to impaired iron use and an attenuated erythropoietin response, leading to functional iron deficiency [5]. Comorbid conditions are strong predictors of the occurrence and degree of anaemia in the elderly. Chronic kidney disease results in a decreased erythropoietin production and an impaired erythropoiesis, while gastrointestinal diseases, such as chronic peptic ulcer disease, can cause occult or overt blood loss [6]. Other contributing illnesses include thyroid dysfunction, liver disease, and malignancy. The origin is usually multifactorial, and multiple coexisting comorbidities commonly act synergistically to decrease haemoglobin levels in older patients. Medication exposure is another critical determinant of anaemia in geriatric populations. Long-term proton pump inhibitor therapy has been demonstrated to impair iron absorption and may contribute to iron deficiency in predisposed individuals [7]. The wide use of antiplatelet and anticoagulant agents is another factor that increases the risk of bleeding. In addition, chronic nonsteroidal anti-inflammatory drug use is associated with gastritis, mucosal injury, and ulcer formation, so that it is an important medication-related risk factor for anaemia in the elderly [8]. Socio-behavioural and lifestyle factors also modify anaemia risk. Smoking has been associated with impaired bone marrow function and chronic inflammation, while low socioeconomic status, limited income, and dependency are associated with inadequate nutrition and poorer utilization of healthcare services. There is evidence from studies using a population-based approach that socioeconomically deprived elderly individuals have much higher anaemia rates compared with their wealthier peers [9]. This is particularly pertinent in low- and middle-income countries, where the pattern of nutritional deficiencies and access barriers can be more pronounced. Anaemia has significant functional and prognostic consequences among older adults. Even mild anaemia has been attributed to lower physical performance, the risk of falls, and poor functional independence [10]. This study

aims to assess anaemia and its associated factors among geriatric patients in a tertiary care hospital.

METHODS & MATERIALS

This cross-sectional descriptive study was carried out in the Department of Medicine, Sylhet MAG Osmani Medical College, which is a tertiary care teaching hospital in Sylhet, Bangladesh, over a period of six months from March to August 2017. All 384 patients aged 60 years or above who were admitted during this period were selected for this study. Participants had to be more than 60 years of age and provide written informed consent. Patients who did not want to participate or with acute bleeding manifestations were excluded. In this study, a consecutive sampling technique was adopted, in which every admitted elderly fulfilling the inclusion and exclusion criteria and agreeing to participate was recruited. Data collection was done by means of a structured checklist, while data analysis was performed using SPSS version 16. The baseline characteristic description and pattern of anemia were summarized descriptively, and the categorical variable associations were done using the χ^2-test. A p-value of <0.05 was considered as the level of significance.

RESULTS

The majority of the patients were aged 60–70 years (58.3%), with a mean age of 67.8 ± 8.1 years. More than half of the study population were females (52.3%) *Table I.*

Table I
Distribution of Patients by Their Demographic Features (*n* = 384).

Demographic Characteristics	Frequency	Percentage (%)	Mean ± SD (Range)
Age (years)			
60–70	224	58.3	67.8 ± 8.1 (60–102)
70–80	108	28.1	
≥80	52	13.5	
Sex			
Male	183	47.7	--
Female	201	52.3	--

Most patients were financially dependent (81.8%), and over half were housewives (51.3%). A large proportion had a monthly income ≤10,000 Taka (82.8%), with a median income of 7000 Taka (*Table II*).

Table II
Distribution of Patients by Their Livelihood (*n* = 384).

Livelihood Characteristics	Frequency	Percentage (%)
Dependency status		
Dependent	314	81.8
Independent	70	18.2
Occupation		
Housewife	197	51.3
Service	15	3.9
Business	20	5.2
Farmer	55	14.3
Labour	25	6.5
Others	72	18.8
Monthly Income (Taka)		
≤10,000	318	82.8
10,001–20,000	45	11.7
20,001–30,000	9	2.3
30,001–40,000	0	0.0
>40,000	12	3.1
Median income (range)	–	7000 (1000–720000)

Hypertension (38%) and diabetes (24.2%) were the most frequent comorbidities. Chronic PUD, cerebrovascular disease, CHF, lung disease, and CKD were also notable contributors (*Table III*).

Table III
Distribution of Patients by Their Co-morbid Conditions (*n* = 384*).

Co-morbid Conditions	Frequency	Percentage (%)
Diabetes mellitus	93	24.2
Hypertension	146	38.0
Chronic PUD	51	13.3
Cerebrovascular disease	41	10.7
Congestive heart failure	38	9.9
Chronic lung disease	35	9.1
Chronic kidney disease	30	7.8
Dementia	4	1.0
Liver disease	16	4.2
Carcinoma (within 5 years)	15	3.9
H/O gastric surgery	2	0.5
Connective tissue disease	6	1.6

Thyroid disorder	6	1.6
Hematological disease	3	0.5
Others	4	1.0

**Multiple responses; totals exceed 100%.*

The most commonly used medications were PPIs (40.9%), followed by antiplatelet/anticoagulants (19.8%) and oral hypoglycemic agents (14.3%) (*Table IV*).

Table IV
Distribution of Patients by Their Drug History (*n* = 384).

Drug History	Frequency	Percentage (%)
PPI	157	40.9
Antiplatelet and anticoagulant	76	19.8
OHA (Metformin)	55	14.3
NSAIDs	38	9.9
Radiotherapy/Chemotherapy	8	2.1
DMARDs	5	1.3

More than one-third of the patients had a history of smoking (37.8%), while alcohol use (2.1%) and drug abuse (0.5%) were rare (*Table V*).

Table V
Distribution of Patients by Deviant Behaviour (*n* = 384).

Deviant Behavior	Frequency	Percentage (%)
Smoking status		
Non-smoker	239	62.2
Current smoker	51	13.3
Ex-smoker	94	24.5
Alcohol use	8	2.1
Drug abuse	2	0.5

No significant association was found between age or sex and the presence of anaemia ($p > 0.05$) (*Table VI*).

Table VI
Association of Anaemia with Age and Sex of the Patients.

Demographics	Anaemia Present (n=172)	Anaemia Absent (n=172)	p-Value*
Age			0.938
60–70	102 (59.3%)	122 (57.5%)	
70–80	47 (27.3%)	61 (28.8%)	
≥80	23 (13.4%)	29 (13.7%)	
Sex			0.102
Male	74 (43.0%)	109 (51.4%)	
Female	98 (57.0%)	103 (48.6%)	

**Chi-square test applied.*

Severe anaemia (<10 g/dL) was more common among females (31.3%) than males (24.6%), but the difference was not statistically significant (*Table VII*).

Table VII
Association Between Severe Anaemia and Sex.

Hb Level (g/dL)	Male (n=183)	Female (n=201)	p-Value*
<10	45 (24.6%)	63 (31.3%)	0.142
≥10	138 (75.4%)	138 (68.7%)	

**Chi-square test applied.*

DISCUSSION

In our cohort, the mean age was 67.8 ± 8.1 years, and most participants (58.3%) were in the 60–70 year bracket; females constituted 52.3% of the sample. These demographic patterns are consistent with other hospital-based geriatric studies: Afaghi et al., in a community-based elderly cohort in Birjand (mean age ≈69.7 years), similarly reported concentration of participants in their 60s and early 70s and modest female predominance [11]. Stauder et al. emphasise that anaemia and age-related multimorbidity cluster in the early-old age groups, which helps explain why hospital samples commonly show a majority in the 60–70 range [12]. A striking socioeconomic finding in our study was that 81.8% were financially dependent and 82.8% reported a monthly income ≤10,000 Taka (median 7000). This high socioeconomic vulnerability parallels systematic analyses showing strong links between low socioeconomic status, food insecurity and higher anaemia risk in older adults; Lopes et al. reported that lower income, limited education and food access were consistent predictors of anaemia in adult and elderly populations across multiple settings [13]. The predominance of

housewives (51.3%) in our sample may amplify nutritional risk because unpaid domestic roles in low-income settings are associated with reduced income and poorer diet quality [14]. Hypertension (38%) and diabetes mellitus (24.2%) were the most frequent comorbidities in our cohort. These cardiometabolic conditions commonly coexist with anaemia: Krishnapillai et al. (national survey analyses) and other hospital studies found similar high co-occurrence of hypertension and diabetes among anaemic older patients, suggesting shared pathways of chronic inflammation, vascular disease and organ dysfunction that promote lower haemoglobin [15,16]. Chronic kidney disease (7.8%) and chronic lung disease (9.1%) recorded here are recognised contributors to reduced erythropoiesis and functional iron sequestration described in geriatric reviews [12,17]. Medication exposures in our population were notable: 40.9% used proton pump inhibitors (PPIs) and 19.8% used antiplatelet/anticoagulant agents. The association between long-term acid suppression and iron deficiency is supported by large epidemiologic data: Lam et al. conducted a case-control analysis of >77,000 iron-deficiency cases and found that ≥2 years of PPI use doubled to quadrupled the odds of iron deficiency depending on dose and duration [18]. Case reports and clinical series from different settings have documented PPI-related iron deficiency and haemoglobin decline after prolonged use, reinforcing PPI exposure as a plausible contributor to the high anaemia burden we observed [19]. Similarly, multiple reviews and cohort studies have shown that antiplatelet and anticoagulant use increases the risk of occult gastrointestinal bleeding in older adults, which can manifest as chronic iron-deficiency anaemia in ambulatory and hospitalised patients [20]. Behavioural factors in our sample included a smoking history in 37.8% (current + ex-smokers). While smoking sometimes elevates haemoglobin via carboxyhaemoglobin and hypoxic stimulus, large population studies report inconsistent associations between smoking and clinically significant anaemia; the mixed findings in the literature are consistent with our observation of no statistically significant association between smoking and anaemia here [13,17]. Finally, although overall anaemia presence did not differ significantly by age or sex in our study ($p>0.05$), severe anaemia (<10 g/dL) was numerically higher among women (31.3% vs 24.6% in men). Several population studies have observed higher rates of severe or iron-deficiency anaemia among older women in low-resource settings-likely reflecting cumulative life-course nutritional deficits and diseases that disproportionately affect women-which is congruent with our sex-stratified severity pattern [11,13].

LIMITATIONS

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

This study shows that anaemia in geriatric patients is influenced by socioeconomic vulnerability, multiple chronic illnesses, and the use of medications such as PPIs and antithrombotics. Although no significant association with age or sex was found, severe anaemia was more frequent in females.

RECOMMENDATION

Routine screening for anaemia should be implemented in geriatric patients, especially those with chronic illnesses or low socioeconomic status. Clinicians should carefully evaluate medication use, nutritional status, and comorbid conditions, and provide timely interventions to prevent or manage anaemia, with particular attention to women at higher risk of severe anaemia.

FUNDING

No funding sources

CONFLICT OF INTEREST

None declared

REFERENCES

1. World Health Organisation. Guideline on haemoglobin cutoffs to define anaemia in individuals and populations. World Health Organisation; 2024 Mar 5.
2. Stauder R, Valent P, Theurl I. Anemia at older age: etiologies, clinical implications, and management. Blood, The Journal of the American Society of Hematology. 2018 Feb 1;131(5):505-14.
3. Longo DL, Camaschella C. Iron-deficiency anemia. N Engl J Med. 2015 May 7;372(19):1832-43.
4. Weiss G, Goodnough LT. Anemia of chronic disease. New England Journal of Medicine. 2005 Mar 10;352(10):1011-23.
5. Ferrucci L, Fabbri E. Inflammageing: chronic inflammation in ageing, cardiovascular disease, and frailty. Nature Reviews Cardiology. 2018 Sep;15(9):505-22.
6. Price EA, Mehra R, Holmes TH, Schrier SL. Anemia in older persons: etiology and evaluation. Blood Cells, Molecules, and Diseases. 2011 Feb 15;46(2):159-65.
7. Ito T, Jensen RT. Association of long-term proton pump inhibitor therapy with bone fractures and effects on absorption of calcium, vitamin B12, iron, and magnesium. Current gastroenterology reports. 2010 Dec;12(6):448-57.
8. Lanas A, Chan FK. Peptic ulcer disease. The Lancet. 2017 Aug 5;390(10094):613-24.
9. Corona LP, Duarte YA, Lebrão ML. Prevalence of anemia and associated factors in older adults: evidence from the SABE Study. Revista de Saúde Pública. 2014 Oct;48(5):723-431.
10. Penninx BW, Guralnik JM, Onder G, Ferrucci L, Wallace RB, Pahor M. Anemia and decline in physical performance among older persons. The American journal of medicine. 2003 Aug 1;115(2):104-10.
11. Afaghi H, Sharifi F, Moodi M, AnaniSarab G, Kazemi T, Miri-Moghaddam E, Tahergorabi Z. Prevalence of anemia and associated factors among the elderly population in South Khorasan, Birjand, 2019. Medical Journal of the Islamic Republic of Iran. 2021 Jul 5; 35:86.
12. Stauder R, Valent P, Theurl I. Anemia at older age: etiologies, clinical implications, and management. Blood, The Journal of the American Society of Hematology. 2018 Feb 1;131(5):505-14.
13. Lopes SO, Ribeiro SA, Morais DD, Miguel ED, Gusmão LS, Franceschini SD, Priore SE. Factors associated with anemia among adult and elderly family farmers. International Journal of Environmental Research and Public Health. 2022 Jun 16;19(12):7371.
14. Marzban M, Nabipour I, Farhadi A, Ostovar A, Larijani B, Darabi AH, Shabankari E, Gholizade M. Association between anemia, physical performance and cognitive function in Iranian elderly people: evidence from Bushehr Elderly Health (BEH) program. BMC Geriatrics. 2021 May 24;21(1):329.
15. Krishnapillai A, Omar MA, Ariaratnam S, Awaluddin S, Sooryanarayana R, Kiau HB, Tauhid NM, Ghazali SS. The prevalence of anemia and its associated factors among older persons: Findings from the National Health and Morbidity Survey (NHMS) 2015. International Journal of Environmental Research and Public Health. 2022 Apr 20;19(9):4983.
16. Girelli D, Busti F. Anemia and adverse outcomes in the elderly: a detrimental inflammatory loop? Haematologica. 2019 Mar;104(3):417.
17. Melku M, Asefa W, Mohamednur A, Getachew T, Bazezew B, Workineh M, Enawgaw B, Biadgo B, Getaneh Z, Damtie D, Terefe B. Magnitude of Anemia in Geriatric Population Visiting Outpatient Department at the University of Gondar Referral Hospital, Northwest Ethiopia: Implication for Community-Based Screening. Current gerontology and geriatrics research. 2018;2018(1):9869343.
18. Lam JR, Schneider JL, Quesenberry CP, Corley DA. Proton pump inhibitor and histamine-2 receptor antagonist use and iron deficiency. Gastroenterology. 2017 Mar 1;152(4):821-9.
19. Imai R, Higuchi T, Morimoto M, Koyamada R, Okada S. Iron deficiency anemia due to the long-term use of a proton pump inhibitor. Internal Medicine. 2018 Mar 15;57(6):899-901.
20. Zappulla P, Calvi V. Gastrointestinal bleeding and direct oral anticoagulants among patients with atrial fibrillation: Risk, prevention, management, and quality of life. TH Open. 2021 Apr;5(02):e200-10.