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Patterns of Anaemia and Relevant Profiles Among Elderly Patients Attending a Geriatric Hospital in Bangladesh

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Abstract

Background: Anaemia is a common issue in elderly patients, linked to complications such as increased mortality risk, cardiovascular disease, cognitive decline, longer hospital stays, and comorbidities.

Methods: This cross-sectional study was conducted in a geriatric hospital in Bangladesh to assess the common patterns of anaemia among elderly patients. Socio-demographic, dietary, drug history, comorbidities, and clinical profiles were collected. Haematological and biochemical parameters were analysed using standard methods.

Results: A total of 79 participants were enrolled. The mean age of the participants was 64.84 ±6.08 years, with 59.5% men and 40.5% women. Normocytic anaemia was the most common type (52%), followed by microcytic (43%) and macrocytic anaemia (5%). Fatigue was the most frequently reported symptom (89.9%), and hypertension was the most prevalent comorbidity (58.23%). The majority of the participants followed a non-vegetarian diet.

Conclusion: Normocytic anaemia is the predominant pattern among the anaemic geriatric population in this setting, frequently co-occurring with chronic comorbidities like hypertension.

Keywords: Anaemia, geriatric medicine, geriatric nutrition

Introduction

With life expectancy reaching nearly 75 years, elderly people (aged 60 and above) comprise over 9% of the total population in Bangladesh now (1). Among all the morbidities of elderly people, anaemia represents a significant public health issue worldwide. Anaemia in geriatric patients represents a challenge and a burden for the individual, community and healthcare providers. Ageing naturally increases vulnerability, and anaemia in older adults is associated with reduced mobility and higher mortality rates (2)(3). It is also linked to a greater incidence of coronary heart disease and increased frailty (4)(5). Micronutrient deficiencies, particularly of iron, folic acid, and vitamin B12, are well-documented causes of anaemia in this population and have been shown to impair cognitive function and immune status (6). Therefore, understanding the types of anaemia, dietary habits, possible causes, severity, and coexisting conditions in elderly patients is crucial for effective management.

Materials and Methods

This cross-sectional study was conducted with the participants recruited from a geriatric hospital named Probin Hospital (Bangladesh Association of Aged and Institute of Geriatric Medicine), Agargaon, Sher-e-Bangla Nagar, Dhaka, Bangladesh. Elderly men and women aged 60 years or older with clinical and haematological evidence of anaemia were eligible. Participants with recent blood transfusions, or

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who received folic acid or iron supplements within the last 12 weeks, or were on steroid therapy, were excluded. Socio-demographic data were obtained through face-to-face interviews using a semi-structured questionnaire. Anthropometric measurements were performed following standard procedures. Venous blood samples were collected aseptically and sent to the haematology department for analysis of haemoglobin, mean cell volume (MCV), mean cell haemoglobin (MCH), mean cell haemoglobin concentration (MCHC), and red cell distribution width (RDW-CV) using a haematology analyser. Peripheral blood films were prepared manually. Biochemical tests—including iron profile, serum vitamin B12, and serum folic acid—were conducted in the Biochemistry Department at Bangladesh Medical University (BMU). Anaemia was defined according to World Health Organization (WHO) criteria: haemoglobin < 12 g/dL in women and < 13 g/dL in men (7). Only those presenting to the medical outpatient department with clinically and laboratory-confirmed anaemia were included. Prior approval was obtained from the Institutional Review Board (IRB) of BMU. Data were analysed using SPSS version 23.0 for Windows. Quantitative variables were expressed as means ± standard deviations and compared using the unpaired t-test and ANOVA for p-values. Qualitative data were presented as frequencies and percentages, with associations tested using the chi-square test. Fisher's Exact test was used for categorical tables with small cell counts. A p-value < 0.05 was considered statistically significant.

Table I: Distribution of the study participants by socio-demographic variable (n=79)

Demographic variable	Number of participants	Percentage
Age (in years)		
60-64	44	55.7
65-69	22	27.8
≥70	13	16.5
Mean±SD	64.84±6.08	
Range (min, max)	(60, 90)	
Gender		
Male	47	59.5
Female	32	40.5
Marital status		
Married	78	98.7
Divorced	1	1.3
Educational level		
Illiterate	11	13.9
Primary	43	54.4
Secondary	18	22.8
Higher secondary	3	3.8
Graduate	4	5.1
Occupational status		
Retired	14	17.7
Unemployed	15	19
Business	21	26.6
Homemaker	25	31.6
Day labourer	4	5.1

Results

A total of 79 participants were enrolled during the study period, with blood samples obtained from all (100%). Participants' ages ranged from 60 to 90 years, with a mean age of 64.84 ± 6.08 years. There were 47 males (59.5%) and 32 females (40.5%), yielding a male-to-female ratio of 1.5:1. The most prevalent type of anaemia was normocytic, seen in 41 participants (52%), followed by microcytic anaemia in 34 (43%) and macrocytic anaemia in 4 (5%). Among those with microcytic anaemia, iron deficiency anaemia (IDA) was the most common cause, accounting for 27 cases (79%). The most frequent symptom was fatigue (89.9%), followed by skin and conjunctival pallor (87%), with paraesthesia being the least reported symptom at 1.3%. Common comorbidities included hypertension (58.22%), diabetes (45.57%), and rheumatoid arthritis (4%). The majority of participants were non-vegetarian.

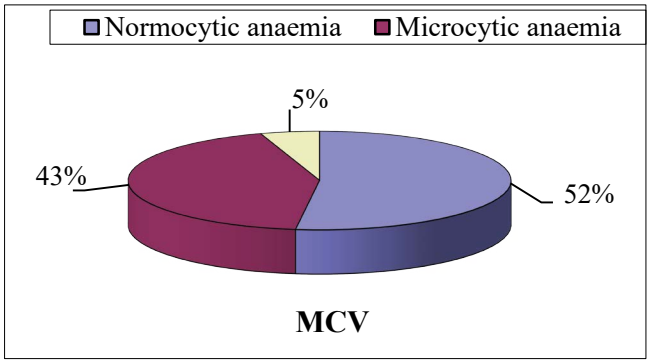

Figure 1: Pie-chart showing types of anaemia by MCV of the study respondents

Table II: Comorbidities present in different types of anaemia of elderly respondents (n=79)

Comorbidities	Normocytic (n=41)		Macrocytic (n=4)		Microcytic (n=34)	
	n	%	n	%	n	%
DM	22	53.7	0	0	14	41.2
HTN	28	68.3	0	0	18	52.9
CKD	3	7.3	0	0	14	41.2
Rheumatoid arthritis	2	4.9	0	0	1	2.9
Ischaemic heart disease	12	29.3	0	0	8	23.5
COPD/Asthma	5	12.2	0	0	2	5.9
Osteoarthritis	7	17.1	0	0	3	8.8

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Table III: Comparison of different types of anaemia and BMI of elderly respondents (n=79)

BMI (kg/m²)	Normocytic (n=41)		Macrocytic (n=4)		Microcytic (n=34)		*p* value
	n	%	n	%	n	%	
Underweight (<18.5 kg/m²)	3	7.3	0	0	6	17.6	
Normal (18.5-24.9 kg/m²)	27	65.9	4	100	25	73.5	
Overweight (25.0-29.9 kg/m²)	10	24.4	0	0	3	8.8	
Obese (>30 kg/m²)	1	2.4	0	0	0	0	
Mean±SD	22.72±3.34		20.17±1.15		21.72±2.93		0.168^{ns}
Range(min,Max)	17.6,30		19.16,21.33		17,28		

ns= not significant, p value reached from ANOVA test

Table IV: Comparison of different types of anaemia and dietary habit of respondents (n=79)

Dietary habit	Normocytic (n=41)		Macrocytic (n=4)		Microcytic (n=34)		
	n	%	n	%	n	%	
Animal and Vegetable protein	40	97.56	4	100	33	97.05	0.938^{ns}
Vegan	1	2.44	0	0	1	2.95	0.938^{ns}
Lactovegan	0	0	0	0	0	0	-
Ovo vegan	0	0	0	0	0	0	-
Lacto-ovo vegan	0	0	0	0	0	0	-
Animal protein							
Once a week	1	2.43	0	0	1	2.95	0.848^{ns}
Twice a week	18	43.9	3	75	16	47.05	
More than twice a week	21	51.23	1	25	16	47.05	
Vegetable protein							
Once a week	2	4.8	0	0	4	11.76	0.303^{ns}
Twice a week	6	14.6	2	50	5	14.74	
More than twice a week	33	80.6	2	50	25	73.5	

ns= not significant, p value reached from Fisher's exact test

Table V: Comparison of different types of anaemia with drugs of elderly respondents (n=79)

Drugs	Normocytic (n=41)		Macrocytic (n=4)		Microcytic (n=34)		P value
	n	%	n	%	n	%	
PPI	5	12.2	0	0	16	47.1	0.00^{1}s
NSAID	7	17.1	0	0	5	14.7	0.659^{ns}
Anti-helminthic	21	51.2	3	75	16	47.1	0.569^{ns}

ns= not significant, p value reached from Fisher's exact test

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Table VI: Clinical profile of different types of anaemia of elderly respondents (n=79)

Clinical profile	Normocytic (n=41)		Macrocytic (n=4)		Microcytic (n=34)	
	n	%	n	%	n	%
Fatigue	33	80.5	4	100	34	100
Malaise	29	70.7	4	100	29	85.3
Skin and Conjunctival Pallor	31	75.6	4	100	34	100
Breathlessness	1	2.4	0	0	1	2.9
Paresthesia	0	0	1	25	0	0
Headache	32	78	1	25	29	85.3
Poor memory	0	0	2	50	0	0
Angular stomatitis	0	0	0	0	8	23.5
Koilonychia	1	2.4	0	0	9	26.5
Glossitis	9	22	2	50	29	85.3
Smooth sore tongue	1	2.4	2	50	10	29.4
Palpitation	1	2.4	0	0	1	2.9

Table VII: Comparison of iron deficiency anaemia with non-iron deficiency anaemia (n=34)

Iron profile	Iron deficiency anaemia (n=27)	Non-iron deficiency anaemia (n=7)	*P* value
	Mean±SD	Mean±SD	
Hb (gm/dl)	8.34±1.5	9.6±1.49	0.056^{ns}
Range (min-max)	6.1-11.4	7.6-11.3	
MCV (fl)	69.4±4.79	76.87±4.91	0.028^{s}
Range (min-max)	56-78.5	62-79.7	
MCH (pg)	20.9±2.23	25.91±3.32	0.001^{s}
Range (min-max)	15.6-27.5	19.6-29.3	
MCHC (gm/dl)	29.8±2.63	33.57±2.62	0.001^{s}
Range (min-max)	24.5-34.8	30.4-37.6	
RDW-CV (%)	19.2±3.93	14.93±2.30	0.001^{s}
Range (min-max)	11.3-28	12.8-19.3	
Serum Iron (µg/dL)	26.0±15.4	79.1±5.3	0.001^{s}
Range (min-max)	11-62	70-85	
Serum ferritin (ng/ml)	23.5±29.9	252.5±315.6	0.001^{s}
Range (min-max)	0.4-96	77.27-953	
TIBC (µg/ml)	416.1±67.0	328.4±26.2	0.001^{s}
Range (min-max)	241-564	305-374	
TSAT (%)	6.3±3.9	24.8±2.0	0.001^{s}
Range (min-max)	2-15	20.85-26.8	

s= significant, p value reached from Unpaired t-test

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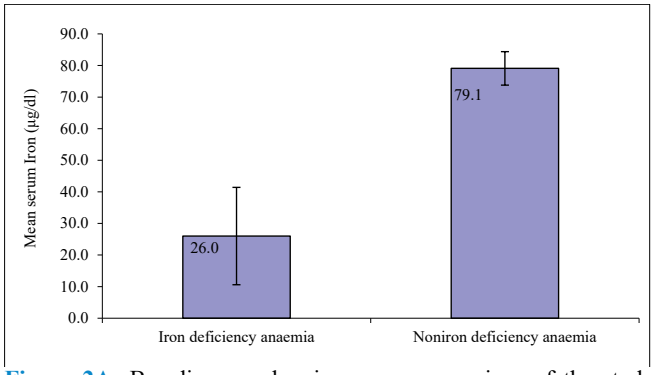

Figure 2A: Bar diagram showing mean serum iron of the study respondents.

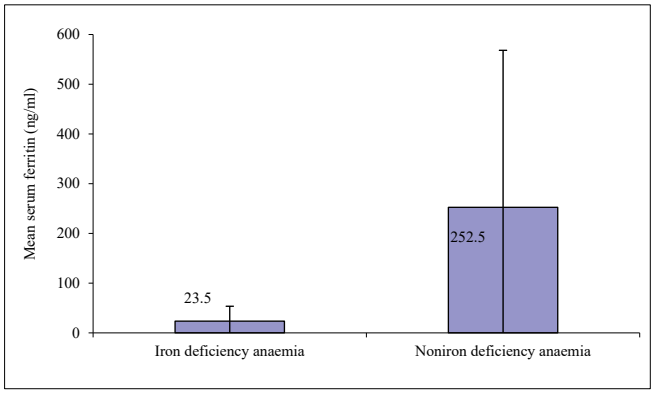

Figure 2B: Bar diagram showing mean serum ferritin of the study respondents.

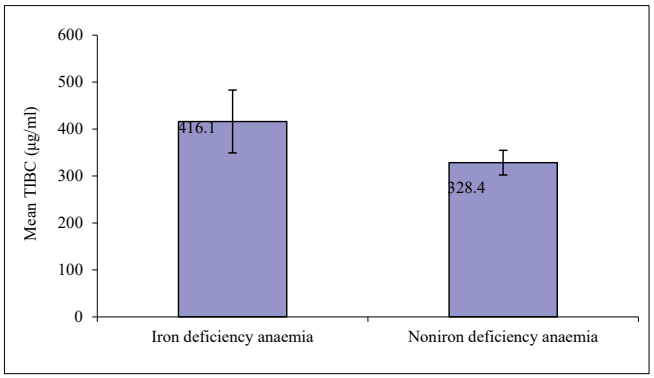

Figure 2C: Bar diagram showing mean TIBC of the study respondents.

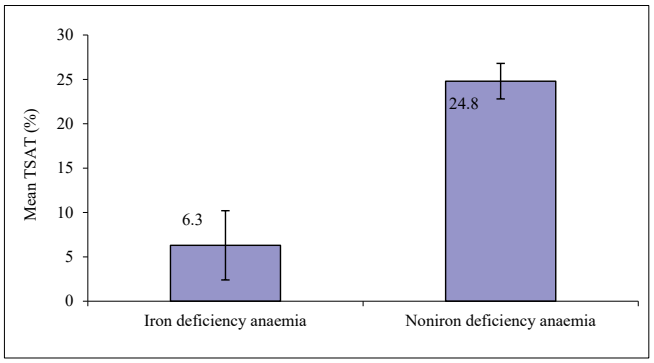

Figure 2D: Bar diagram showing mean TSAT of the study respondents

Discussion

This cross-sectional study was conducted among elderly individuals aged 60 and above at a geriatric hospital in Dhaka City. Normocytic anaemia was the most common type, observed in 52% of participants. This finding aligns with the high prevalence of chronic diseases in the elderly and is consistent with the study by Sharma et al. (8). Iron deficiency anaemia (IDA) was found in 34.18% (27 out of 79) of participants, closely matching results reported by Petrosyan et al. (9). A macrocytic blood picture was observed in 5% of participants, comparable to findings by Stouten et al. (10).

It is important to note that not all subjects with a microcytic blood picture were iron deficient; this may be attributed to conditions such as thalassemia, sideroblastic anaemia, or anaemia of chronic disease. Consequently, iron deficiency may remain undiagnosed when it coexists with chronic illness. Among comorbidities, hypertension (HTN) was the most common, affecting 58.22% of respondents, similar to the study by Islam & Majumder (11). Diabetes mellitus (DM) was present in 45.57%, consistent with findings from Talukder & Hossain (12). Chronic kidney disease (CKD) was observed in 21.52%, aligning with Banik & Ghosh (13), while ischemic heart disease (IHD) affected 25.32%, comparable to Muhit et al. (14). Regarding clinical symptoms, fatigue was reported by 89.9% of participants, followed by skin and conjunctival pallor in 87.3%, and paraesthesia was least common at 1.3%, findings similar to Bhasin & Rao (15). In terms of dietary habits, 97% of respondents reported consuming animal protein, with 46.8% consuming it more than twice a week. Similarly, 97% consumed vegetable protein, with 76% consuming it more than twice a week. No statistically significant association was found between dietary intake and anaemia, unlike Aspuru et al. (16), which linked poor dietary intake with iron deficiency anaemia. Among the elderly, 20.3% were using proton pump inhibitors (PPIs), with 76.2% of these belonging to the microcytic anaemia group. This association was statistically significant ($p = 0.001$), supporting Sarzynski et al. (17), who reported that PPIs impair micronutrient absorption and contribute to anaemia. Anaemia prevalence was higher in males (59.5%) than females (40.5%), consistent with Sodhi (18). The majority of participants (55.7%) were aged 60-64 years, with a mean age of 64.84 ± 6.08 years (range 60–90), similar to Sharma et al. (8). Gender distribution showed nearly two-thirds were male (59.5%) and one-third female (40.5%). This study contributes valuable insight into the types and prevalence of anaemia and associated factors among the elderly in this population.

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Conclusion

The most common pattern of anaemia observed in this study was normocytic anaemia (52%), followed by microcytic (43%) and macrocytic (5%) types. The most prevalent symptom among participants was fatigue, and hypertension was the most common comorbidity. Additionally, the majority of respondents reported a non-vegetarian dietary habit. This study was conducted exclusively at a single specialized geriatric hospital in Dhaka and may not be generalizable to the broader community-dwelling elderly population across Bangladesh. Moreover, due to the observational, cross-sectional design, temporal or causal relationships between identified risk factors (e.g., proton pump inhibitor use, dietary intake) and the development of anaemia cannot be definitively established. Larger prospective cohort studies across diverse geographic regions in Bangladesh are recommended

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