

Original Article

Aetiological and Clinical Pattern of Severe Anaemia in a Tertiary Care Hospital at Rajshahi, Bangladesh

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Abstract

Background: Anaemia is a common health problem encountered in our day to day medical practice. It occurs in every age groups, in both sexes in every communities and all countries.

Objective: To find out the aetiological pattern and clinical profile of severe anaemia for prompt diagnosis and proper management.

Materials and Methods: The prospective study was carried out in different Medicine unit at Rajshahi Medical College Hospital (RMCH), Rajshahi on consecutive 100 hospital admitted patients having severe anaemia. All underwent routine and some special investigations for severe anaemia.

Results: Peak age incidence was 20-29 years (38%) and sex incidence was male (68%). Most of the patients were farmers (38%). Common monthly income group was >2000-5000 (48%). Incidence of severe anaemia was aplastic (26%), leukaemia (24%), haemolytic (22%), anaemia of chronic disorder (10%), iron deficiency anaemia (9%) and anaemia of chronic renal failure (9%). Peak age incidence for aplastic anaemia was 20-29 years (42.3%), for leukaemia 14-19 years 33.3%, for haemolytic anaemia 14-19 years (50%), for anaemia of chronic disorder 20-29 and 30-39 years (30% each), iron deficiency anaemia 40-49 years (44.5%) and for anaemia of chronic renal failure 30-39 years (33.3%).

Conclusion: Multicentre study with large sample size is warranted to develop more insights about diagnosis and management of severe anaemia.

Key words: Severe anaemia, Sex, Income, Iron, Leukaemia.

Introduction

Anaemia occurs in all age groups, in both sexes in every communities and in all countries of the world. The degree which varies according to underlying disease process. Around 30% of total population is anaemic¹. Anaemia may be defined as a reduction of haemoglobin (Hb) concentration, red cell, or packed cell volume (PCV) or haematocrit (Hct) to below normal level². Anaemia should be considered to exist in adult whose Hb level is 15±2 g/dl in men and 13.5±1.5 g/dl in

women, red cell count 5.5±0.5x10¹²/L in men and 4.3±0.5x10¹²/L in women, and red cell volume (RCV), and RCV 45.00±0.05 L/L in men and 0.41±0.05 L/L in women^{1,3}. The symptoms and signs in an anaemic patient depends on the underlying disease, as well as on the severity and chronicity of the anaemia. The clinical features of anaemia can be described as those due to the anaemia itself and those due to the causative disorder⁴. Clinicians categorize anaemia as mild, moderate and severe at bedside. However, when Hb level is <7 g/dl, it

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can be arbitrarily considered as severe anaemia^{5,6}. However, Pennington et al. defined severe anaemia when Hb level is <6 g/dl⁷. It appears that severe anaemia in Bangladeshi population is less frequent, possibly present among only 2-3% of the population⁸. The aetiological pattern and presentation of such cases in our country differs from that of the other parts of the world. The cause of anaemia in surgical and/or gynaecological setting are often obvious, but study on aetiological pattern of severe anaemia in medical wards may reveal more precisely the cause prevailing in Bangladesh. In this study, we tried to find out aetiological pattern of severe anaemic cases attending a tertiary care hospital in Bangladesh.

Materials and Methods

This study included 100 consecutive adult patients, irrespective of sex, suffering from severe anaemia (Hb level <7 g/dl) admitted to different medicine units of RMCH during July 2002 and June 2003. To arrive at a definite diagnosis of severe anaemia, all patients were underwent complete blood count (CBC), peripheral blood film (PBF), routine examination of urine and stool, blood urea, serum creatinine, X ray chest PA view, Ultrasonogram of whole abdomen (USG). Other special investigations were reticulocyte count, Hb electrophoresis, X ray skull, faecal occult blood test (FOBT), serum iron profile, Coombs' test, endoscopy and colonoscopy. In adults bone marrow was obtained from the posterior iliac crest, under local anaesthesia. Bone marrow was stained and examined under microscope in haematology department of RMCH. Endoscopy and colonoscopy was also done.

Detailed history of the patients were recorded on a predesigned questionnaire which included age, sex, occupation, monthly family income, presenting complaints, past illness, socioeconomic status, family and personal history. Collected data were analyzed using computer based software (SPSS, ver 13).

Results

Out of 100 study patients, age shows, in order of frequency, that 38% belonged to 3rd decade, 23% to 2nd decade, 19% to 4th decade, 12% to 5th decade, 6% to 6th decade and 2% to 7th decade and above (range 14-70 years). Male female ratio was 22.1:2; 68% were male and 32% female. Occupation of the patients were farmer (38%), student (22%), day labourer (15%), sedentary worker (13%) and housewife (12%). Monthly family

income was 2000 taka (49%), >2000-5000 taka (48%) and >5000 (12%). Type of severe anaemia table I was aplastic (26%), leukaemia (24%), haemolytic (22%), anaemia of chronic disorders (10%), iron deficiency anaemia (9%) and anaemia of chronic renal failure (9%).

Table I: Characteristics of severe anaemic patients (n=100)

Parameters	Number	Percentage
Age (years)		
14 - 19	23	23.0
20 - 29	38	38.0
30 - 39	19	19.0
40 - 49	12	12.0
50 - 59	6	6.0
≥ 60	2	2.0
Sex		
Male	68	68.0
Female	32	32.0
Occupation		
Farmer	38	38.0
Student	22	22.0
Daylabourer	15	15.0
Sedentary worker	13	13.0
Housewife	12	12.0
Monthly family income (Taka)		
≤ 2000	40	40.0
>2000 - 5000	48	48.0
>5000	12	12.0
Type of severe anaemia		
Aplastic	26	26.0
Leukaemia	24	24.0
Haemolytic	22	22.0
Anaemia of chronic disorder	10	10.0
Iron deficiency anaemia	9	9.0
Anaemia of chronic renal failure	9	9.0

Out of 26 aplastic anaemia, table II age distribution of idiopathic (n=20) and secondary (n=6) patients, respectively; 8 (40%) and 1 (16.7%) belonged to age group 14-19 years, 9 (45%) and 2 (33.3%) to age group 20-29 years, 2 (10%) and 2 (33.3%) to age group 30-39 years, 1 (5%) and 1 (16%) to age group 40-49 years, and none to age group 50-59 and 60 years.

Sex distribution was male 14 (70%) and 5 (83.3%), and female 6 (30%) and 1 (16.7%).

Table II: Characteristics of aplastic anaemia patients

Parameters	Idiopathic (n=20)		Secondary (n=6)		Total (n=26)	
	No.	(%)	No.	(%)	No.	(%)
Age (years)						
14 -19	8	(40.0)	1	(16.7)	9	(34.6)
20 -29	9	(45.0)	2	(33.3)	11	(42.3)
30 -39	2	(10.0)	2	(33.3)	4	(15.4)
40 -49	1	(5.0)	1	(16.8)	2	(7.7)
50 -59	0		0		0	
≥ 60	0		0		0	
Sex						
Male	14	(70.0)	5	(83.3)	19	(73.1)
Female	6	(30.0)	1	(16.7)	7	(26.9)

Out of 24 leukaemia patients, table III age distribution of ALL (acute lymphoblastic leukaemia, n=12), AML (acute myeloblastic anaemia, n=9), CML (chronic myeloid leukaemia, n=2) and CLL (chronic lymphatic leukaemia, n=1), respectively, were 8 (66.7%), 0, 0 and 0 belonged to age group 14-19 years, 3 (25%), 3 (33.3), 0 and 0 to age group 20-29 years, 1 (8.3%), 2 (22.2%), 2 (100%) and 0 to age group 30-39 years, 0, 2 (22.2%), 2 (100%) and 0 to age group 40-49 years, 0, 0, 0 and 1 (100%) to age group 50-59 years, and none to age group 60 years. There were 8 (66.7%), 6 (66.7%), 2 (100%) and 1 (100%) males and 4 (33.3%), 3 (33.3%), 0 and 0 females.

Table III: Characteristics of leukaemia patients

Parameters	ALL (n=12)	AML (n=9)	CML (n=2)	CLL (n=1)	Total (n=24)
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Age (years)					
14-19	8 (66.7)	0	0	0	8 (33.3)
20-29	3 (25.0)	3 (33.3)	0	0	6 (25.0)
30-39	1 (8.3)	4 (44.4)	0	0	5 (20.8)
40-49	0	2 (22.2)	2 (100.0)	0	4 (16.7)
50-59	0	0	0	1 (100.0)	1 (4.2)
≥ 60	0	0	0	0	0
Sex					
Male	8 (66.7)	6 (66.7)	2 (100.0)	1 (100.0)	17 (70.8)
Female	4 (33.3)	3 (33.3)	0	0	7 (29.2)

ALL : Acute lymphoblastic leukaemia
AML : Acute myeloblastic leukaemia
CML : Chronic myeloid leukaemia
CLL : Chronic lymphocytic leukaemia

Out of 22 haemolytic anaemia patients, table IV age distribution of Hb E/? thalassaemia (n=20) and ? thalassaemia (n=2) were 9 (45%) and 2 (100%) belonged

to age group 14-19 years, 10 (50%) and 0 to 20-29 years, 1 (5%) and 0 to age group 30-39 years, and none to age group 40-49, 50-59 and 60 years. Sex distribution was male 14 (70%) and 1 (50%), and female 6 (30%) and 1 (50%).

Table IV: Characteristics of haemolytic anaemia patients

Parameters	Hb -E/ beta-thalassaemia (n=20)		beta-thalassaemia (n=2)		Total (n=22)	
	No.	(%)	No.	(%)	No.	(%)
Age (years)						
14 -19	9	(45.0)	2	(100.0)	11	(50.0)
20 -29	10	(50.0)	0		10	(45.5)
30 -39	1	(5.0)	0		1	(4.6)
40 -49	0		0		0	
50 -59	0		0		0	
≥ 60	0		0		0	
Sex						
Male	14	(70.0)	1	(50.0)	15	(68.2)
Female	6	(30.0)	1	(50.0)	7	(31.8)

Out of 10 anaemia of chronic disorder patients, table V age distribution of PTB (pulmonary TB with haemoptysis, n=4), RA (rheumatoid arthritis, n=3), MD (malignant disease, n=2) and SLE (systemic lupus erythromatosus, n=1) was none belonged to age group 14-19 years, 1 (25%), 0, 0 and 0 to age group 20-29 years, 2 (50%), 0, 0 and 1 (100%) to age group 30-39 years, 1 (25%), 2 (66.7%), 0 and 0 to age group 40-49 years, 0, 1 (33.3%), 1 (50%) and 0 to age group 50-59 years, and 0, 0, 1 (50%) and 0 to age group 60 years. Sex distribution was male 3 (75%), 1 (25%), 2 (100%) and 0, and female 1 (25%), 2 (75%), 0 and 1 (100%).

Table V: Characteristics of anaemia of chronic disorder patients

Parameters	PTB (n=4)	RA (n=3)	MD (n=2)	SLE (n=1)	Total (n=10)
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Age (years)					
14-19	0	0	0	0	0
20-29	1 (25.0)	0	0	0	1 (10.0)
30-39	2 (50.0)	0	0	1 (100.0)	3 (30.0)
40-49	1 (25.0)	2 (66.7)	0	0	3 (30.0)
50-59	0	1 (33.3)	1 (50.0)	0	2 (20.0)
≥60	0	0	1 (50.0)	0	1 (10.0)
Sex					
Male	3 (75.0)	1 (25.0)	2 (100.0)	0	6 (60.0)
Female	1 (25.0)	2 (75.0)	0	1	4 (40.0)

PTB : Pulmonary TB with haemoptysis
RA : Rheumatoid arthritis
MD : Malignant disease
SLE : Systemic lupus erythromatosus

Out of 9 iron deficiency anaemia patients, table VI age distribution of BPU (bleeding peptic ulcer, n=4), BH (bleeding haemorrhoids, n=2), CS (carcinoma colon, n=1), BDROV (bleeding due to rupture oesophageal varices, n=1), respectively, were none belonged to age group 14-19 years and 20-29 years, 1(25%), 0, 0, 0 and 1 (100%) to age group 30-39 years, 2 (50%), 1 (50%), 1 (100%), 0 and 0 to age group 40-49 years, 1 (25%), 1 (50%), 0, 1 (100%) and 0 to age group 50-59 years, and none to age group 60 years. Sex distribution of 9 iron deficiency anaemia patients was male 6 (66.7%) and 3 (3.3) female.

Table VI: Characteristics of iron deficiency anaemia

Parameter	BPU (n=4)	BH (n=2)	CS (n=1)	CC (n=1)	BDROV (n=1)	Total (n=9)
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Age (years)						
14-19	0	0	0	0	0	0
20-29	0	0	0	0	0	0
30-39	1 (25.0)	0	0	0	1 (100.0)	2 (22.2)
40-49	2 (50.0)	1(50.0)	1(100.0)	0	0	4 (44.5)
50-59	1 (25.0)	1(50.0)	0	1(100.0)	0	3 (33.3)
≥60	0	0	0	0	0	0
Sex						
Male						6 (66.7)
Female						3 (3.3)
Legend:						
BPU	: Bleeding peptic ulcer					
BH	: Bleeding haemorrhoids					
CS	: Carcinoma stomach					
CC	: Carcinoma colon					
BDROV	: Bleeding due to rupture oesophageal varices					

Age distribution of 9 chronic renal failure table VII anaemia patients were none belonged to age group 14-19 years, 1 (11.1%) to age group 20-29 years, 4 (44.4%) to age group 30-39 years, 2 (22.2%) to age group 40-49 years, 1 (11.1%) to age group 50-59 years, and 1 (11.1%) to age group 60 years. Sex distribution shows that there were 7 (77.8%) males and 3 (33.3%) females.

Table VII: Characteristics of anaemia of chronic renal failure patients (n=9)

Parameters	Number	Percentage
Age (years)		
14 - 19	0	0
20 - 29	1	11.1
30 - 39	4	44.4
40 - 49	2	22.2
50 - 59	1	11.1
≥ 60	1	11.1
Sex		
Male	7	77.8
Female	2	22.2

Discussion

Anaemia is a common medical problem worldwide, mainly encountered among patients attending medicine, obstetric and paediatric departments. The aim of this study was to find out the aetiological pattern of severe anaemia among 100 consecutively selected patients admitted to department of medicine, RMCH during July 2002 and June 2003. We found that anaemia was prevalent among all groups, 2nd to 7th decade, with peak age incidence at 3rd decade (20-29 years, 38%). In two studies by Islam and Sarkar, the incidence was 36% and 26%, respectively^{9,10}. In our series, male female ration was 2.12:1 (68% vs 32%). Male preponderance may be due to the fact that male patients present themselves to hospitals compared to female. Common occupation of anaemic patients were farmer (38%) and student (22%), others were day labourer (15%), sedentary worker (13%) and housewife (12%).

Out of 26 aplastic anaemia, suspected secondary causes was present in 6 (32.1%) cases, which is consistent with the findings by Habib and Islam¹¹. But our finding is not consistent with the findings by Lewis (50%), Kochupilli et al. (38.8%), Bottiger and Westerholm (12.5%)^{12,14}. The most common was of aplastic anaemia was 14-29 years (76.9%). This is consistent with the findings by Habib, Kochupilli et al. and Islam^{11,13,15}. Male were three times more suffers (73.1%) than female (26.9%), which is consistent with the findings by Bottiger and Westerholm¹⁴.

Out of 24 cases of leukaemia found in this study, the incidence of acute lymphoblastic leukaemia (ALL) was the highest (50%), followed by acute myeloid leukaemia (AML, 37.5%), chronic myelocytic leukaemia (CML, 8.3%) and chronic lymphocytic leukaemia (CLL, 4.2%). Shahi et al observed that highest incidence was ALL (35%), and next CML (16.4%)¹⁶. Our finding is consistent with the findings of Habib¹¹. Incidence of AML was 37.5% in our study, which is consistent with the finding by Islam¹⁵. CML had lowest incidence (4.2%) compared to Habib (3.7%) and Kushwaha et al. (2%)^{11,17}. As a whole, highest incidence of leukaemia was in the 2nd decade (33.3%). Majority of ALL patients were aged <20 years (66.7%), and those of AML was with the range of 20-30 years. Kushwaha et al. found 80% ALL were aged <20 years¹⁷. There was also male predominance in individual type of leukaemia, Keating et al. found 58% male and 42% female¹⁸. Out of 22 haemolytic anaemia, 20 (90.9%) were diagnosed as Hb E/? thalassaemia and 2 (9.1%) as ? thalassaemia major.

Habib showed that incidence of Hb E/? thalassaemia was 93%¹¹. Other investigators also reported Hb E/? thalassaemia as the common type of haemolytic anaemia^{19,20}.

Out of 10 anaemia of chronic disorders patients, 4 (40%) had pulmonary tuberculosis (PTB), 3 (30%) rheumatoid arthritis (RA), 2 (20%) malignant disorders (MD), 1 (10%) systemic lupus erythematosus (SLE). The incidence of PTB found by Habib was 70%, and by Islam was 45%^{11,15}. In this study, the age of chronic disorder patients was <50 years, highest incidence in 3rd and 4th decade (30%). Crofton et al. showed highest incidence in 4th decade (50%)²¹.

Worldwide, the most common type of anaemia is iron deficiency anaemia^{20,22}. However, in our study, the most common type of anaemia was aplastic (26%) and iron deficiency anaemia was least prevalent (9%). Other types were leukaemia (24%), haemolytic (22%) and anaemia of chronic disorders (10%). This discord may be due to the fact that iron deficiency anaemia most commonly occurs in children during their period of growth and in pregnant women at 3rd trimester²³. but these type of patients were excluded from the present study.

Anaemia almost always accompany uraemic syndrome²⁴. Out of 100 cases 9 (9%) had chronic renal failure which is consistent with the studies by Habib and Islam^{11,15}.

Conclusion

Although one of the objective of this study was to see the prognosis of the patients suffering from severe anaemia, only few were available for follow up. Furthermore, no definite conclusion could be drawn from this study regarding the aetiological pattern of severe anaemia as the study was carried out on adult hospitalized patients, during limited time period and only at one hospital.

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