

Iron Deficiency Anemia: A profile of a tertiary care hospital

Rinku Joshi¹, Dhan Bahadur Shrestha², Drishti RL Shah¹, Sitaram Khadka³

¹Department of Medicine, Shree Birendra Hospital, Chhauni; Nepalese Army Institute of Health Sciences (NAIHS)
²Intern, Shree Birendra Hospital, Chhauni; NAIHSm ³Department of Medicine, Shree Birendra Hospital, Chhauni

ABSTRACT

Background and aim: Iron deficiency refers to the reduction of iron stores that precedes overt iron deficiency anemia. Iron deficiency anemia (IDA) is the commonest nutritional deficiency around the globe. Though etiology of IDA is multifaceted, and results from the iron demands which is not met by iron absorption in the body, regardless of the reason. This study was aimed to observe the several hematologic parameters among IDA cases presented to a tertiary level referral hospital of Nepal army.

Methods: This prospective hospital based study was conducted among cases of iron deficiency anemia presented to a hematology clinic for six-month duration. With the help of semi-structured questionnaire demographic variables, presenting complaints, baseline laboratory parameters, iron profile and etiology of iron deficiency anemia were recorded. The collected data were entered in SPSS version 22 and analyzed.

Results: In the six-month study period, there were 175 IDA cases who presented to hematology clinic. IDA was more common in females accounting 78% of 175 cases while rest were male. Mean value of parameters of iron profile were all significantly lower than normal range except TIBC which was significantly raised clinching the diagnosis of IDA. Weakness was the commonest mode of presentation (83, 47.4%). Poor intake was the main culprit of IDA (88, 50.3%). Most of the cases (82, 46.9%) belonged to moderate anemia group. Severity of anemia was associated with platelet count and total leucocyte count ($p < 0.05$) while it was not associated with iron profile values ($p > 0.05$).

Conclusion: In adult group, IDA is more common in women and non-specific symptoms like weakness is the commonest mode of presentation. Poor dietary intake is the main cause of IDA in our context. Among IDA cases, most of them belonged to moderate anemia.

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INTRODUCTION

Iron deficiency refers to the reduction of iron stores that precedes overt iron deficiency anemia.¹ Iron deficiency anemia (IDA) is the commonest nutritional deficiency around the globe with considerable impact on health affecting 2 percent in adult men, 9 to 12 percent in non-Hispanic white women,

and nearly 20 percent in black and Mexican-American women.¹⁻⁴ Though etiology of IDA is multifaceted, and results from the iron demands which is not met by iron absorption in the

*Corresponding author
Dr. Dhan Bahadur Shrestha
Birendra Hospital, Chhauni, Kathmandu
e-mail: medhan75@gmail.com

body, regardless of the reason. Notable causes are inadequate intake, impaired absorption or transport, physiologic losses associated with chronological or reproductive age, or chronic blood loss secondary to disease.^{3,5,6} It has a great public health significance affecting children, adolescents and women of reproductive age worldwide.^{7,8} Worldwide, prevalence of IDA is estimated to be 20-80 % among reproductive age female population and has impact on the both fetal and maternal health.⁹ Iron supplement in antenatal period has pivotal role.¹⁰ Anemia reduces physical work capacity and cognitive function and adversely affects learning and school performance in schoolgirls entering adolescence so it needs the proper address on time.¹¹

One study from Nepal showed, the prevalence of anemia, 12%; depleted iron stores, 20%; IDA, 6% and iron deficient erythropoiesis in 7% of non-pregnant women of reproductive age group respectively.¹²

This study was aimed to observe several hematologic parameters among IDA cases presented to the tertiary level referral hospital of Nepal army as such study have not been conducted so far.

METHODS

Selection and Description of Participants

This single centered, prospective cross-sectional study was conducted among anemic patients presented to hematology clinic and kept under regular follow up of a tertiary level hospital in Kathmandu over a period of six months from June to December 2017. With the help of semi-structured questionnaire demographic variables, presenting complaints, baseline laboratory parameters, iron profile and etiology of iron deficiency anemia were recorded. All the diagnosed cases of IDA were evaluated for the etiology and treated with iron therapy based on severity and standard protocol and kept under regular follow-up. Again, iron profile was repeated among all cases at third month of follow up.

The study proposal was approved by ethical review committee (IRC) of Nepalese army institute of health sciences (NAIHS). Informed verbal consent was taken while enrolling the individual in the study.

Statistics

The collected data were entered in SPSS version 22 and analyzed. Chi-square test was used to see association between severity of iron deficiency anemia with other variables with the help of p value based on 95% confidence interval and 5% standard error.

RESULT

In the six-month study period, there were 175 iron deficiency anemia cases who presented to hematology clinic. Proper evaluation was done with physical examination and laboratory parameters to see overall health status and severity of anemia. The mean age of patients was 52.61±15.44 years and hemoglobin 8.46±1.5 gm/dl. Mean value of parameters of iron profile were all significantly lower than normal range except TIBC which was significantly raised clinching the diagnosis of IDA (Table 1.).

	Min.	Max.	Mean	Std. Deviation
AGE	15	87	52.61	15.441
Hemoglobin	2.0	10.9	8.465	1.5479
TC	2400	15200	6317.66	2367.921
Platelets	50000	534000	255091.43	104322.680
MCV	49.0	77.0	68.459	5.4183
MCH	13.0	32.0	23.614	3.8159
MCHC	18.8	34.9	29.581	2.6316
RDW	14.5	23.0	16.919	1.3517
Serum Iron	1.9	49.0	20.526	12.3642
Serum Ferritin	1.0	80.0	15.336	11.5330
TIBC	192.0	589.0	341.674	82.8368
Ferritin at 3 months	18.0	236.0	82.023	36.7930

Table 1. Descriptive parameters of IDA cases

IDA was more common in females accounting 78% of 175 cases and rest were male (Figure 1.)

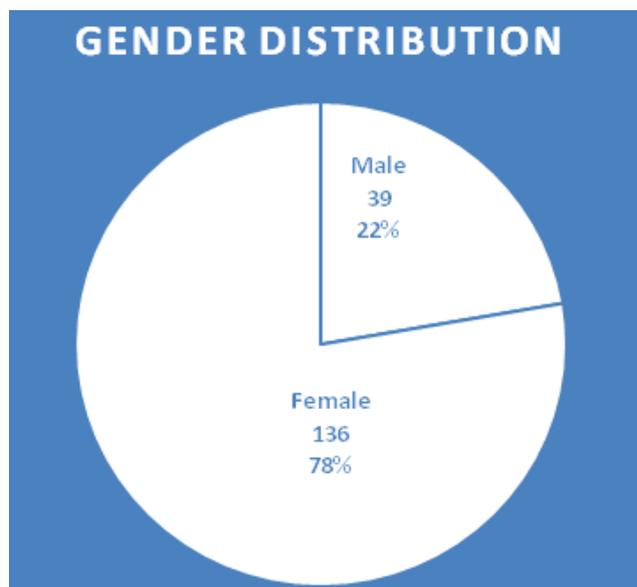


Figure 1. Gender distribution of IDA

Among the cases of IDA, commonest mode of presentation

was generalized weakness (83, 47.4%). Other symptoms were per-vaginal (PV) bleeding, upper gastrointestinal (UGI) bleeding, per-rectal (PR) bleeding, Shortness of breath (SOB), bleeding due to road traffic accident, paleness etc. (Table 2.).

Presenting complaint	Frequency	Percent
Weakness	83	47.4
PV Bleeding	35	20.0
UGI bleeding	30	17.1
SOB	7	4.0
PR Bleeding	7	4.0
Other cause of Blood Loss	6	3.4
Paleness	4	2.3
Myalgia	3	1.7
Total	175	100.0

Table 2. Mode of presentation of IDA cases

Among the cases of IDA, most common cause was nutritional, due to poor intake (88, 50.3%), followed by UGI bleeding and other mode of blood loss (Table 3.).

Cause of IDA	Frequency	Percent
Nutritional	88	50.3
UGI bleeding	38	21.7
Menorrhagia	18	10.3
Fibroid	10	5.7
LGI Bleeding	8	4.6
Ca CX	7	4.0
Other cause of Blood loss	5	2.9
PTB	1	.6
Total	175	100.0

Table 3. Etiology of IDA

Based on level of hemoglobin IDA cases were categorized into mild, moderate, severe and life-threatening anemia. Most of the cases (82, 46.9%) were belonging to moderate anemia group (Table 4.)

Severity of anemia	Frequency	Percent
Moderate Anemia (8-10)	82	46.9
Severe Anemia (6.5-8)	47	26.9
Mild Anemia (above 10)	30	17.1
Life threatening (less than 6.5)	16	9.1
Total	175	100.0

Table 4. Severity of IDA

In all patients, MCV was lower than normal while RDA was high. In most of the cases (132), peripheral blood film showed microcytic hypochromic anemia while in rest (43) there was

associated polychromasia and anisopoikilocytosis. In most (>75%) of the cases studied; MCH, MCHC, serum ferritin was lower than normal. Only in 2 cases, serum ferritin was not corrected after 3 months of the treatment while in rest, it was normalized. Severity of anemia was associated with platelet count and total leucocyte count ($p < 0.05$) while severity was not associated with iron profile study ($p > 0.05$) (Table 5.).

Variables	Mild Anemia (above 10)	Moderate Anemia (8-10)	Severe Anemia (6.5-8)	Life threatening (less than 6.5)	Total	p-value	
Total counts	Less than 4000	1	7	5	0	13	.011
	Normal (4-11000)	29	70	41	12	152	
	Higher than 11000	0	5	1	4	10	
Platelets	Less than 150000	5	13	10	3	31	.026
	Normal (150-450000)	24	69	34	10	137	
	Higher than 450000	1	0	3	3	7	
Peripheral Blood Films	MHA	22	61	37	12	132	.255
	MHA with Polychromasia and anisopoikilocytosis	2	11	7	4	24	
	MHA with Anisopoikilocytosis	6	10	3	0	19	
MCV	Less than 78	30	82	47	16	175	-
MCH	Less than 27	20	63	38	13	134	.509
	Normal (27-33)	10	19	9	3	41	
MCHC	Less than 33	29	72	45	15	161	.283
	Normal (33-35)	1	10	2	1	14	-
RDW	High (More than 14)	30	82	47	16	175	-
Serum Ferritin	Less than 20	23	64	41	11	139	.376
	Normal (20-400)	7	18	6	5	36	
Serum ferritin at 3 months	Less than 20	0	1	1	0	2	.816
	Normal (20-400)	30	81	46	16	173	
TIBC	Less than 250	3	11	8	1	23	.713
	Normal (250-370)	13	41	25	10	89	
	High (More than 370)	14	30	14	5	63	

Table 5. Severity of anemia and its relation with other parameters

DISCUSSION

Iron deficiency anemia is a common hematological problem in medical practice with more burden in developing and underdeveloped world.^{1,13} In this study, the mean age of patients was 52.61 ± 15.44 years and hemoglobin 8.46 ± 1.5 gm/dl. Similarly, other studies also support high prevalence of anemia in extreme of age due to several factors.^{14,15} One study concluded high prevalence of anemia after 50 years, and older counting

greater than 20% by 85 years. In older age group there is tendency of having anemia either due to nutritional or chronic diseases.¹⁵

IDA presents with nonspecific symptoms due to poor oxygen carrying capacity of blood. IDA can be result of various factors like dietary factor, blood loss and parasitic infestations.^{1,6} In this study, commonest mode of presentation was generalized weakness and blood loss from gastrointestinal tract. Among the cases of IDA, most common cause was nutritional, due to poor intake (50.3%), followed by UGI bleeding. Most of the cases (46.9%) belonged to moderate anemia group in present study while some study has reported mild anemia as the commonest entity in elderly group.¹⁵ Iron profile study is the commonly performed laboratory study to diagnose IDA. In most cases, MCV, serum ferritin will be low while iron binding capacity will be high. And there will be typical picture of IDA in peripheral blood film.^{1,6}

Peripheral blood film showed microcytic hypochromic anemia in 132 cases while in rest there was associated polychromasia

and anisopoikilocytosis in current study. Severity of anemia were associated with platelet count and total leucocyte count ($p < 0.05$) while severity was not associated with iron study ($p > 0.05$) in this study while such things has not been mentioned in previous studies.

CONCLUSION

In adult group, women are most commonly affected and non-specific symptoms like generalized weakness is the commonest mode of presentation of IDA. Poor dietary intake is the main cause of IDA in our context. Among IDA cases, most of them belonged to moderate anemia group. Severity of anemia was associated with total leucocyte count and platelets while iron profile and severity of anemia did not show any association. This small study was conducted among army personnel and their family in a tertiary level hospital but to make it generalizable, further study may be needed with a large sample size.

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